CODE No.: 14BT1BS02 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

I B.Tech (SVEC14) Supplementary Examinations June - 2022

ENGINEERING CHEMISTRY

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Distinguish between smectic, nematic and cholesteric liquid crystal types with suitable examples.	7 Marks
	b)	Define electrochemical sensors. Write important applications of electrochemical sensors.	7 Marks
		(OR)	
2	a)	Write different types of conducting polymers and give their important engineering applications.	7 Marks
	b)	Write different types of composites and their applications.	7 Marks

UNIT-II

3	a)	A sample of water on analysis gives the following $MgCl_2$ = 9.5 ppm, $CaSo_4$ = 3.4 ppm, $Mg(HCO_3)_2$ = 7.3 ppm $MgSO_4$ = 6.0 ppm. Calculate temporary and permanent hardness of the sample.	7 Marks
	b)	What are scales and sludges? How do they effect the boiler? How can they be prevented?	7 Marks
		(OR)	
4	a)	Discuss the estimation of hardness by EDTA method.	7 Marks
	b)	Discuss desalination of brackish water by reverse osmosis method.	7 Marks

UNIT-III

5	a)	Write the construction of standard hydrogen electrode and calomel electrode.	7 Marks
	b)	What is fuel cell? Write brief construction and reactions involved in H_2-O_2 fuel cell. Write its important applications.	7 Marks
		(OR)	
6	a)	Define electroplating. Explain electroplating of nickel.	8 Marks
	b)	Write the chemistry of Ni-Cd battery and give its important applications.	6 Marks

UNIT-IV

7	a)	Discuss various types of liquid lubricants.	7 Marks
	b)	How do you synthesis petrol by Fischer-Tropsch process.	7 Marks
		(OR)	
8	a)	How to determine the calorific value of solid fuel by bomb calorimeter	7 Marks
	b)	Write short note on: i) Fire Point	7 Marks

ii) Cloud Point

UNIT-V

9	a)	What is the effect of nanotechnology on food science?	7 Marks
	b)	How Plasma Enhanced Chemical Vapour Deposition is useful for synthesis of nanomaterials. How it is advantage over sol-gel process.	7 Marks

(OR)

10	a)	Explain about green manufacturing systems by taking suitable example.	7 Marks
	b)	Write short notes on: i) Green solvents ii). Biocatalysis	7 Marks

CODE No.:14BT1BS03 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

I B.Tech (SVEC14) Supplementary Examinations June – 2022

ENGINEERING MATHEMATICS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Solve the Differential equation: $\frac{dy}{dx} + y\cos x = y^3 \sin 2x$ 7 Marks

b) Find the orthogonal trajectories of the family of circles $\mathbf{x^2 + y^2 + 2gx + c = 0}$ where g is the parameter. 7 Marks

(OR)

2 a) Solve the differential equation $(D^2 + 2D + 2)y = e^{-x} + \sin 2x$ 7 Marks

b) Applying the method of variation of parameters solve $(D^2 + 4)y = \sec 2x$ 7 Marks

UNIT-II

3 a) If $u = \sin^{-1}\left(\frac{x}{y}\right) + \tan^{-1}\left(\frac{y}{x}\right)$, show that $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = 0$ 7 Marks

b) Determine the point where the function $u = x^2 + xy + 3x + 2y + 5$ has a maxima or minima. 7 Marks

(OR)

4 a) Sketch the curve for the equation $r = a\sin 3\theta$. 7 Marks

b) Find the radius of curvature at the point (r, θ) of the cardioids $r = a(1 - \cos\theta)$. 7 Marks

UNIT-III

5 a) Show that the whole length of the curve $\mathbf{x^2(a^2 - x^2) = 8a^2y^2}$ is $\pi a\sqrt{2}$ 7 Marks

b) Evaluate $\iint (x^2 + y^2)dxdy$ in the positive quadrant for which $x + y \le 1$. 7 Marks

(OR)

6 a) Evaluate $\iiint xyz\,dxdydz$ taken through the positive octant of the sphere $\mathbf{x^2 + y^2 + z^2 = a^2}$ by transforming in to spherical coordinates. 7 Marks

b) Change the order of integration and evaluate $\int_0^1 \int_{x^2}^{2-x} xydxdy$. 7 Marks

UNIT-IV

7 a) Find the Laplace transformation of $f(t) = |t - 1| + |t + 1|, t \ge 0$. 7 Marks

b) Use convolution theorem to evaluate $L^{-1}\left\{\frac{S}{(s+2)(s^2+9)}\right\}$. 7 Marks

(OR)

8 a) Find $L\left\{\int_0^t \frac{e^{-t}\sin t}{t}\,dt\right\}$ 7 Marks

b) Solve $\frac{d^2x}{dt^2} + 9x = \cos 2t$, if $x(0) = 1, x\left(\frac{\pi}{2}\right) = -1$ 7 Marks

UNIT-V

9 a) A vector field is given by $A = \left(x^2 + xy^2\right)\hat{i} + \left(y^2 + yx^2\right)\hat{j}$. Show that the field is irrotational, and find the scalar potential. 7 Marks

b) Find the work done in moving a particle in the force field $\bar{F} = 3x^2 i + (2xz - y)j + zk$, along the straight line from (0, 0, 0) to (2, 1, 3). 7 Marks

(OR)

10 a) Verify divergence theorem for $\boldsymbol{F = x^2 i + y^2 j + z^2 k}$ taken over the rectangular parallelepiped $\boldsymbol{0 \le x \le a, 0 \le y \le b, 0 \le z \le c}$. 7 Marks

b) Evaluate $\iiint_V xyz\,dx\,dy\,dz$ take over the volume V of the tetrahedron given by $x \ge 0,\ y \ge 0,\ z \ge 0$ and $x + y + z \le 1$. 7 Marks

CODE No.:14BT1BS04 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

I B.Tech (SVEC14) Supplementary Examinations June – 2022

MATHEMATICAL METHODS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Find the rank of the matrix $\begin{bmatrix} 1 & 2 & 3 & 0 \\ 2 & 4 & 3 & 2 \\ 3 & 2 & 10 & 3 \\ 6 & 8 & 7 & 5 \end{bmatrix}$ by reducing it into normal form. 7 Marks

b) Verify Cayley –Hamilton Theorem for the matrix $\begin{bmatrix} 1 & 1 & 3 \\ 1 & 3 & -3 \\ -2 & -4 & -4 \end{bmatrix}$ 7 Marks

(OR)

2 a) Find the eigen values and eigen vectors of the matrix $\begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$ 7 Marks

b) Reduce the quadratic form $3x^2 + 5y^2 + 3z^2 - 2xy - 2yz + 2zx$ to the canonical form and find its rank, index and signature 7 Marks

UNIT-II

3 a) Find the positive root of $x^4 - x = 10$ correct to three decimal places, using Newton-Raphson method. 7 Marks

b) Given $\log_{10}654=2.8156$, $\log_{10}658=2.8182$, $\log_{10}659=2.8189$, $\log_{10}661=2.8202$, find by using Lagrange's formula, the value of $\log_{10}656$. 7 Marks

(OR)

4 a) Find a real root of the equation $x \log_{10} x = 1.2$ lying between 2 and 3 by Regula-falsi method, correct to four decimal places. 7 Marks

b) Find the values of a, b, c so that $y = a + bx + cx^2$ is the best fit to the following data: x **0 1 2 3 4 y 1 0 3 10 21** 7 Marks

UNIT-III

5 a) The population of certain town(as obtained from census data) is shown in the table: 7 Marks

year:	1971	1981	1991	2001	2011
Population in thousands:	19.96	39.65	58.81	77.21	94.61

Find the rate of the growth of the population in 1971 and 2011.

b) Compute y (0.1) from first approximation of Picard's method for the initial value problem $\frac{dy}{dx} = \frac{y - x}{y + x}$. 7 Marks

(OR)

6 a) Using Euler's modified method, obtain a solution of the equation $\frac{dy}{dx} = x + |\sqrt{y}|$ with initial condition y=1 at x=0, for the range $0 \le x \le 0.4$ in steps of 0.2 . 7 Marks

b) A river is 80 feet wide. The depth d in feet at a distance x feet from one bank is given by the following table: 7 Marks

X	0	10	20	30	40	50	60	70	80
D	0	4	7	9	12	15	14	8	3

Find approximately the area of the cross-section of the river.

UNIT-IV

7 a) Find the half-range Sine series for the function $f(x) = x - x^2$, $0 < x < 1$. 7 Marks

b) Find $Z^{-1}\left[\frac{z^2 - 3}{(z+2)(z^2+1)}\right]$. 7 Marks

(OR)

8 a) Find the Fourier series to represent the function $f(x) = |\sin x|, = \pi < x < \pi$. 7 Marks

b) Evaluate $Z^{-1}\left(\frac{z}{(z-a)(z-b)}\right)$ using convolution theorem. 7 Marks

UNIT-V

9 a) Find the differential equation of all spheres whose centers lie on the Z-axis. 7 Marks

b) A rod of length l with insulated sides is initially at a uniform temperature u_0. Its ends are suddenly cooled to 0ºC and are kept at that temperature. Find the temperature function u(x, t). 7 Marks

(OR)

10 a) Form the partial differential equation from $xyz = \phi(x + y + z)$ by eliminating the arbitrary function. 7 Marks

b) Form a partial differential equation arising from $\varphi\left(x + y + z, x^2 + y^2 + z^2\right) = 0$ where φ is an arbitrary function. 7 Marks

CODE No.:14BT1ES01 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

I B.Tech (SVEC14) Supplementary Examinations June – 2022

PROGRAMMING IN C AND DATA STRUCTURES

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	How does a program get executed? Discuss the role of interpreter and compiler.	7 Marks
	b)	Write a flowchart for acquiring B.Tech degree from your college after EAMCET examination.	7 Marks
		(OR)	
2	a)	Explain the structure of C program.	7 Marks
	b)	What is a datatype? Discuss C datatypes.	7 Marks

UNIT-II

3	a)	What are Non-formatted input and output statements in C? Give suitable examples.	7 Marks
	b)	Explain the use of break and continue statement in loops with example.	7 Marks
		(OR)	
4	a)	Explain the 'while' statement with an example.	7 Marks
	b)	Write a C program to find the GCD of two numbers.	7 Marks

UNIT-III

5	a)	What is an array? Discuss its declaration. How to initialize multidimensional array.	7 Marks
	b)	Write a program to print binary equivalent of a decimal number using array.	7 Marks
		(OR)	
6	a)	How functions help in handling complexity of problem solving? Explain.	7 Marks
	b)	Write a C program to reverse a string with out using library function.	7 Marks

UNIT-IV

7	a)	Explain array of structures and structure within a structure with examples.	7 Marks
	b)	Write a C program to read and display a text from the file.	7 Marks
		(OR)	
8	a)	Explain the following with syntax and example : i) Pointer as function argument. ii) Function returning pointer.	7 Marks
	b)	Describe the pointer in C with an example.	7 Marks

UNIT-V

9	a)	Discuss the operations allowed on queues with illustrations.	7 Marks
	b)	Can you construct a stack using single linked list? Justify your answer.	7 Marks
		(OR)	
10	a)	Give an example for binary tree. Explain various kinds of binary tress.	7 Marks
	b)	Write a program to implement a queue using arrays.	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

I B.Tech (SVEC10) Supplementary Examinations February – 2021

ENGINEERING MATHEMATICS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Electronics and Control Engineering, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer any FIVE questions
All questions carry equal marks

1. a) Solve the differential equation $(1+y^2)dx = (\tan^{-1}y - x)dy$.

b) Find the orthogonal trajectories of the family of curves $r^n = a\sin n\theta$.

2. a) Using the method of variation of parameters, solve $y'' - 6y' + 9y = \frac{e^{3x}}{x^2}$.

b) Show that the frequency of free vibrations in a closed electrical circuit with inductance L and capacity C in series is $\frac{30}{\pi\sqrt{LC}}$.

3. a) Determine whether the following functions are functionally dependent or not. If they are functionally dependent find the relation between them.

$$u = \frac{x}{y} \qquad v = \frac{x+y}{x-y}$$

b) Examine for extreme values of $\mathbf{f(x,y) = x^4 + y^4 - 2x^2 + 4xy - 2y^2}$

4. a) Show that the evolute of the cycloid x = a(θ - sin θ) , y = a(1 - cos θ) is another cycloid.

b) Trace the curve $\mathbf{ay^2 = x^3}$

5. a) Find the Laplace transform of (i) e^{4t} sin2t cost. (ii) $(1-e^t)/t$.

b) Apply convolution theorem to evaluate $L^{-1}\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$.

6. a) Use Laplace transform method to solve $\frac{d^2x}{dt^2} - 2\frac{dx}{dt} + x = e^t$ with x=2, $\frac{dx}{dt} = -1$ at t = 0.

b) Find the inverse Laplace transform of $\log\frac{s+1}{s-1}$.

7. a) Transform the integral $\int_0^\infty\int_0^\infty e^{-1(x^2+y^2)}dxdy$ to polar coordinates and hence evaluate.

b) Change the order of integration $\int_0^1\int_{x^2}^{2-x} xy\,dxdy$ and hence evaluate the same.

8. a) Prove that $\nabla^2 f(r) = f^{11}(r) + \frac{2}{r}f^1(r)$.

b) Use the divergence theorem to evaluate $\iint_S xdydz + ydzdx + zdxdy)$, where S is the portion of the plane $x + 2y + 3z = 6$ which lies in the first octant.

❀ ❀ ❀

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

I B.Tech (SVEC14) Supplementary Examinations August – 2021

ENGINEERING PHYSICS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain absorption process, spontaneous and stimulated emission and derive Einstein's coefficients.	6 Marks
	b)	Explain construction and working of a He-Ne Laser with the help of energy level diagram. Mention few applications of Lasers in engineering field.	8 Marks
		(OR)	
2	a)	Discuss the construction and reconstruction of a Hologram.	6 Marks
	b)	What are different types of Optical Fibers? Classify them based on modes of propagation and index profile. Mention few industrial and medical applications of Optical Fibers.	8 Marks

UNIT-II

3	a)	Explain the construction of Hologram.	6 Marks
	b)	Describe the acceptance cone and numerical aperture.	8 Marks
4	a)	Derive the Separation between Successive (hkl) Planes.	6 Marks
	b)	Explain Laue Diffraction of crystals with diagram.	8 Marks

UNIT-III

5	a)	Why is the wave nature of matter not apparent in our daily observations? Explain it with suitable example.	4 Marks
	b)	What is the importance of Schrodinger's wave equation? Derive an expression for the wave function and energy of a particle confined in a one dimensional potential box.	10 Marks
		(OR)	
6	a)	What is effective mass? Derive an expression for effective mass of an electron.	9 Marks
	b)	Explain origin of energy band formation in solids.	5 Marks

UNIT-IV

7	a)	Derive Clausius - Mossotti Equation in dielectrics subjected to static fields.	8 Marks
	b)	Describe frequency and temperature dependence of polarization in dielectric medium.	6 Marks
		(OR)	
8	a)	Derive an expression for intrinsic carrier concentration.	7 Marks
	b)	Explain qualitatively the working of a PN Junction Diode using energy level diagram.	7 Marks

UNIT-V

9	a)	Explain the Hysteresis of ferromagnetism.	6 Marks
	b)	Describe the classification of magnetic materials with properties and examples.	8 Marks

(OR)

10	a)	Explain the general properties of Superconductors.	6 Marks
	b)	Describe the BCS theory. What is the penetration depth?	8 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

I B.Tech (SVEC14) Supplementary Examinations August – 2021

ENGINEERING CHEMISTRY

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Write a note on electrical insulators.	7 Marks
	b)	Define the terms: i) Dielectric constant. ii) Dielectric loss. iii) Dielectric strength.	7 Marks
		(OR)	
2	a)	What are conducting polymers? How they are classified? Write important applications of conducting polymers.	7 Marks
	b)	Explain about amperometric sensors. Give its applications.	7 Marks

UNIT-II

3	a)	What is meant by hardness of water? What are its units and write interrelation between them.	7 Marks
	b)	Define scale and sludge. How it will be overcome?	7 Marks
		(OR)	
4	a)	Discuss the estimation of hardness by EDTA method.	7 Marks
	b)	Discuss desalination of brackish water by reverse osmosis method.	7 Marks

UNIT-III

5	a)	Explain the working principle of solid oxide fuel cells with reactions.	7 Marks
	b)	Give the significance of hydrogen electrode in electrochemical cells.	7 Marks
		(OR)	
6	a)	Define corrosion. Discuss concentration cell corrosion.	7 Marks
	b)	Compare H_2-O_2 fuel cell with traditional cells.	7 Marks

UNIT-IV

7	a)	Explain mechanism of lubrication using boundary film lubrication.	7 Marks
	b)	Describe various steps involved in refining of petroleum.	7 Marks
		(OR)	
8	a)	How do you measure viscosity using Redwood viscometer?	8 Marks
	b)	Explain how refining of petroleum is carried out.	6 Marks

UNIT-V

9	a)	What is meant by nano materials? Explain some of its properties.	7 Marks
	b)	How nano materials are synthesized? Explain aSol-Gel process.	7 Marks
		(OR)	
10	a)	Write about any two methods for synthesis of nano materials.	7 Marks
	b)	Discuss Green Computing method.	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

I B.Tech (SVEC14) Supplementary Examinations August – 2021

ENGINEERING MATHEMATICS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Solve: $xy(1+xy^2)\frac{dy}{dx} = 1$. 7 Marks

b) Solve: $(D^2+4)y = \tan 2x$ by the method of variation of parameters. 7 Marks

(OR)

2 a) A body of temperature 80^0F is placed in a room of constant temperature 50^0F at a time $t = 0$. At the end of 5 minutes the body has cooled to a temperature of 70^0F. When will the temperature of the body by 60^0F. 7 Marks

b) Solve: $y'' + 2y' + 3y = e^x \cos x$ 7 Marks

UNIT-II

3 a) If $u = \sin^{-1}\left(\frac{x}{y}\right) + \tan^{-1}\left(\frac{y}{x}\right)$, show that $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = 0$ 7 Marks

b) Determine the point where the function $u = x^2 + xy + 3x + 2y + 5$ has a maxima or minima. 7 Marks

(OR)

4 a) Sketch the curve for the equation $r = a\sin^3\theta$. 7 Marks

b) Find the radius of curvature at the point (r, θ) of the cardioids $r = a(1-\cos\theta)$. 7 Marks

UNIT-III

5 a) Find the volume when the loop of the curve $y^2 = x(2x-1)^2$ revolves about the x-axis. 7 Marks

b) Evaluate the following by changing into polar coordinates 7 Marks

$$\int_0^4 \int_0^{\sqrt{16-y^2}} y^2\sqrt{x^2+y^2}\,dx\,dy$$

(OR)

6 a) Change the order of integration in $\int_0^a \int_0^a \frac{x\,dy\,dx}{x^2+y^2}$ and hence evaluate it. 7 Marks

b) Evaluate $\iiint_V (x+y+z)\,dxdydz$ where V volume of the cylinder $x^2+y^2=1$, $z=0$ and $z=4$ by transforming into cylindrical coordinates. 7 Marks

UNIT-IV

7 a) Find the Laplace transform of (i) $\cos^3 4t$ (ii) $e^{-3t}.t^2.\sin(t)$. 7 Marks

b) Solve $\mathbf{y''+2y'+y = 3x.e^{-x}}$ given y(0)=4, y'(0)=0. 7 Marks

(OR)

8 a) Find the inverse Laplace transform of (i) $\cot^{-1}(s)$ (ii) $\frac{s}{(s^2+9)^2}$. 7 Marks

b) Solve $\mathbf{y''-3y'+2y = 4t+e^{3t}}$ given y(0)=1, y'(0)=-1, using Laplace transform. 7 Marks

UNIT-V

9 a) Show that the vector field $\bar{F} = (x^2 + xy^2)\vec{i} + (y^2 + x^2y)\vec{j}$ is irrotational and find a scalar potential **φ** such that $\bar{F} = \nabla\phi$ — 7 Marks

b) Verify Green's Theorem for $\oint_c (xy + y^2)dx + x^2dy$, where C is bounded by $y = x$ and $y = x^2$. — 7 Marks

(OR)

10 a) A vector field is given by $F = (x^2 - y^2 + x)\bar{i} - (2xy + y)\bar{j}$. Show that the field F is irrotational and find its scalar potential. — 7 Marks

b) If $\bar{F} = 3x^2yz^2\bar{i} + x^3z^3\bar{j} + 2x^3yz\bar{k}$, then show that $\int_C \bar{F}.d\bar{r}$ is independent of the path of integration. Hence evaluate the integral where C is any path joining (0, 0, 0) to (1, 2, 3). — 7 Marks

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

I B.Tech (SVEC14) Supplementary Examinations August – 2021

MATHEMATICAL METHODS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Determine the non-singular matrices P and Q such that PAQ is in the normal form for A, and hence obtain the rank of the matrix $A = \begin{bmatrix} 1 & 2 & 3 & -2 \\ 2 & -2 & 1 & 3 \\ 3 & 0 & 4 & 1 \end{bmatrix}$. 7 Marks

b) Solve the following system of equations by Gauss-elimination method: 7 Marks
$2x + 4y + z = 3;\ 3x + 2y - 2z = -2;\ x - y + z = 6.$.

(OR)

2 a) Verify Cayley-Hamilton theorem for $A = \begin{bmatrix} 2 & 1 & 1 \\ 0 & 1 & 0 \\ 1 & 1 & 2 \end{bmatrix}$. Hence find A^{-1}. 7 Marks

b) Reduce the quadratic form $6x^2 + 3y^2 + 14z^2 + 4yz + 18zx + 4xy$ into the canonical form. 7 Marks

UNIT-II

3 a) Find an approximate root of the equation $x^3 - 3x - 5 = 0$, using Newton-Raphson method and correct to four decimal places. 7 Marks

b) Fit a parabola $y = a + bx + cx^2$ to the following data 7 Marks

x :	2	4	6	8	10
y :	3.07	12.85	31.47	57.38	91.29

(OR)

4 a) Estimate the value of f(3.5) from the following data 7 Marks

x :	3	4	5	6	7	8	9
f(x) :	2.7	6.4	12.5	21.6	34.3	51.2	72.9

b) Define forward, backward , central difference operators 7 Marks

UNIT-III

5 a) Find the value of y at x = 0.1, 0.2, if $\frac{dy}{dx} = x - y^2$ and y = 1 at x = 0 , by using Modified Euler's method. 7 Marks

b) A rod is rotating in a plane. The following table gives angle θ (in radians) through which the: 7 Marks
rod has turned for various values of time t (in seconds).

t :	0	0.2	0.4	0.6	0.8	1.0	1.2
θ	0	0.12	0.49	1.12	2.02	3.2	4.67

Estimate angular velocity and angular acceleration of the rod at t = 0.2, 1.0 sec .

(OR)

6 A rod is rotating in a plane. The following table gives angle θ (in radians) through which the: 14 Marks

rod has turned for various values of time t (in seconds).

t :	0	0.2	0.4	0.6	0.8	1.0	1.2
θ	0	0.12	0.49	1.12	2.02	3.2	4.67

Estimate angular velocity and angular acceleration of the rod at t = 0.2, 1.0 sec .

UNIT-IV

7 a) Find the Fourier series to represent function $f(x) = \frac{1}{4}(\pi - x)^2, 0 < x < 2\pi$. 7 Marks

b) Find the Fourier Sine transform of $f(x) = \frac{1}{x(1+x^2)}$. 7 Marks

(OR)

8 a) Find $Z^{-1}\left(\frac{3z^2+z}{(5z-1)(5z+2)}\right)$. 7 Marks

b) Obtain the Half Range Sine series for $f(x) = ax + b$, in (0,1). 7 Marks

UNIT-V

9 a) Form the partial differential equation for $z = y^2 + 2f\left(\frac{1}{x} + \log y\right)$. 7 Marks

b) Solve by the method of separation of variables $3\frac{\partial u}{\partial x} + 2\frac{\partial u}{\partial y} = 0$ with $u(x,0) = 4e^{-x}$. 7 Marks

(OR)

10 An insulated rod of length has its ends A and B maintained at 0^0 C and 100^0 C respectively until steady state condition prevails . If B is suddenly reduced to 0^0 C and maintained at 0^0 C. Find the temperature at a distance x from A at time t. 14 Marks

CODE No.:14BT10301 SVEC-14

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

I B.Tech (SVEC14) Supplementary Examinations August – 2021

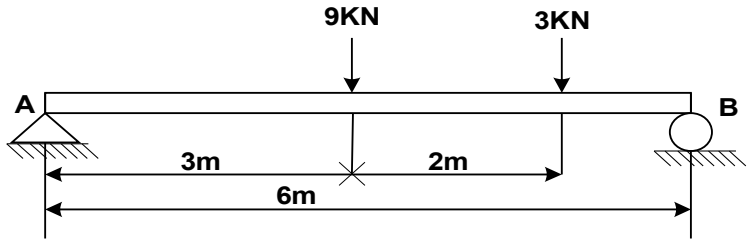
ENGINEERING MECHANICS
[Civil Engineering, Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 A system of parallel forces acting on a rigid bar as shown in figure. Reduce this system to i) A single force ii) A single force at A and couple at A iii) A single force at B and couple at B. 14 Marks



(OR)

2 a) State laws of dry friction. 4 Marks

b) A screw jack has square threads of mean diameter 6cm, helix angle 10^0 and coefficient of friction 0.3. Determine the force that must be applied to the end of 60cm lever to raise a weight of 3000N. 10 Marks

UNIT-II

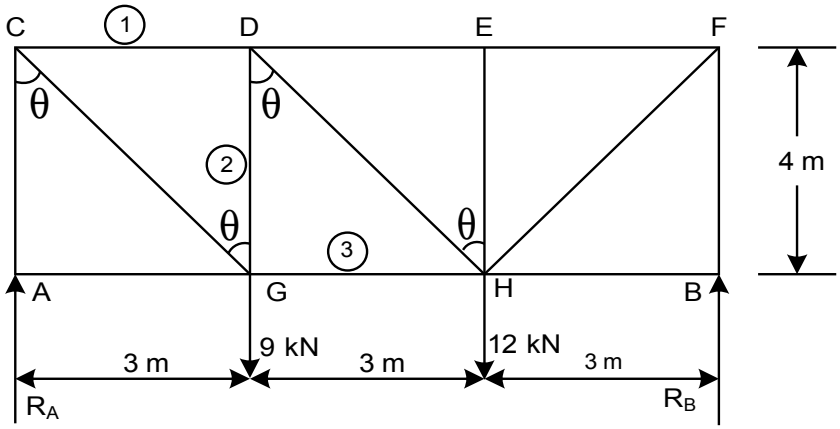
3 a) Differentiate between a roller support and a hinged support. 4 Marks

b) A simply supported beam AB is subjected to a distributed load increasing from 1600 N/m to 4600 N/m from end A to end B respectively. The span AB = 6.5 meters. Determine the reactions at the supports. 10 Marks

(OR)

4 a) State the difference between a perfect frame and an imperfect frame. 4 Marks

b) A truss of span 9m is loaded as shown in figure. Find the forces in the members marked as 1, 2 and 3, by method of sections. 10 Marks



UNIT-III

5	a)	What do you understand by axes of reference?	4 Marks
	b)	A body consists of right circular solid cone of height 100cm and radius of 80cm placed on solid hemisphere of radius equal to 80cm radius of same material. Find the position of the CG of body.	10 Marks

(OR)

6	a)	State and explain Pappus -Guldinus theorems for surface of revolution.	4 Marks
	b)	Find the moment of inertia of a rectangular section of 12cm long and 10cm deep about the centre of gravity.	10 Marks

UNIT-IV

7		A bullet of mass 0.5 kg moving with a speed of 30m/sec was fired into a wooden block of weight 200N, resting on an incline, and inclined 30^0 to the horizontal. If the coefficient of friction is 0.35, find the distance the block travels along the incline in the upward direction	14 Marks

(OR)

8		The motion of a particle is given by $x=2(t+1)^2$ and $y=2(t+1)^{-2}$. Determine the velocity and acceleration of the particle at t=0 and at t=1sec.	14 Marks

UNIT-V

9		A cylinder, a circular hoop and a sphere each having mass M and radius R are released from rest along a rough plane having inclination β. If in each case rolling occurs without slipping, compare the accelerations of mass centres of these three objects. Determine their ratios also.	14 Marks

(OR)

10	a)	Define the Newton Laws of motion for linear motion and rotational motion.	4 Marks
	b)	A train of weight 2000kN starts from rest and attains a speed of 100km/hr in 4 minutes. If the frictional resistance of the track is 8 N per kN of the train's weight, find the average pull required. Take $g=9.8$ m/sec^2.	10 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

I B.Tech (SVEC14) Supplementary Examinations February – 2021

ENGINEERING PHYSICS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What are the characteristics of Lasers?	6 Marks
	b)	Explain the semiconductor laser construction with neat diagram.	8 Marks
		(OR)	
2	a)	Write the Sabine's formula for reverberation time.	6 Marks
	b)	Explain the basic requirements of acoustically good hall.	8 Marks

UNIT-II

3	a)	What is time dilation and length contraction?	4 Marks
	b)	Derive the energy-momentum relation.	10 Marks
		(OR)	
4	a)	Explain the reverberation and time reverberation.	6 Marks
	b)	Describe the absorption coefficient of sand and its measurements.	8 Marks

UNIT-III

5	a)	Explain de Broglie hypothesis.	5 Marks
	b)	Describe G.P Thomson's experiment in support of de Broglie hypothesis.	9 Marks
		(OR)	
6	a)	Distinguish between metal, semiconductors and insulators based on band theory.	6 Marks
	b)	Derive the Kronig-Penney model for Potential Well.	8 Marks

UNIT-IV

7	a)	Describe the drift and diffusion currents in a semiconductor. Derive their expressions and deduce Einstein's relations.	9 Marks
	b)	Define Hall effect and explain its uses.	5 Marks
		(OR)	
8	a)	What is a photo diode? Describe the working of photo diode.	6 Marks
	b)	How can you differentiate intrinsic and extrinsic semiconductors? Derive an expression for the electron concentration in intrinsic semiconductor.	8 Marks

UNIT-V

9	a)	Distinguish between soft and hard magnetic materials.	6 Marks
	b)	Explain the origin of magnetic moment.	8 Marks
		(OR)	
10	a)	Describe the BCS theory of superconductivity.	10 Marks

b) Mention any four applications of super conductivity. 4 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

I B.Tech (SVEC14) Supplementary Examinations February – 2021

ENGINEERING MATHEMATICS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Solve: $xy(1+xy^2)\frac{dy}{dx} = 1$. 7 Marks

b) Solve: $(D^2 + 4)y = \tan 2x$ by the method of variation of parameters. 7 Marks

(OR)

2 a) Solve $\mathbf{y''+ 4y'+3y=e^{-x}.sin(x) + x.e^{3x}.}$ 7 Marks

b) Solve $\mathbf{y''+-3y'+2y=(1+e^{-x})^{-1}}$, using the method of variation of parameters. 7 Marks

UNIT-II

3 a) Express equation $\frac{\partial^2 y}{\partial x^2} + \frac{\partial^2 y}{\partial y^2} = 0$ in polar form (r, θ). 7 Marks

b) Show that the rectangular solid of maximum volume that can be inscribed in a sphere is cube. 7 Marks

(OR)

4 a) Trace the curve $a^2y^2 = x^2(a^2 - x^2)$ 7 Marks

b) Find the radius of curvature at any point of the cardioid $r = a(1 - \cos\theta)$. 7 Marks

UNIT-III

5 a) Find the length of the arc of the parabola $\mathbf{x^2=4ay}$ measured from the vertex to one extremity of the latus rectum. 7 Marks

b) Find the surface of the solid formed by revolving the cardioids r = a(1+cos(θ)) about the initial line. 7 Marks

(OR)

6 a) Change the order of integration in $\int_0^a \int_0^a \frac{x\,dy\,dx}{x^2 + y^2}$ and hence evaluate it. 7 Marks

b) Evaluate $\iiint_V (x + y + z)\,dxdydz$ where V volume of the cylinder $\mathbf{x^2 + y^2 = 1}$, $\mathbf{z = 0}$ and $\mathbf{z = 4}$ by transforming into cylindrical coordinates. 7 Marks

UNIT-IV

7 a) Find the Laplace transform of (i) $\mathbf{\cos^3 4t}$ (ii) $\mathbf{e^{-3t}.t^2.sin(t).}$ 7 Marks

b) Solve $\mathbf{y''+ 2y'+y = 3x.e^{-x}}$ given y(0)=4, y'(0)=0. 7 Marks

(OR)

8 a) Find the inverse Laplace transform of (i) $\mathbf{\cot^{-1}(s)}$ (ii) $\frac{s}{(s^2 + 9)^2}$ 7 Marks

b) Solve $\mathbf{y''- 3y'+2y = 4t+e^{3t}}$ given y(0)=1, y'(0)=-1, using Laplace transform. 7 Marks

UNIT-V

9 a) Show that the vector field $\overline{F} = (x^2 + xy^2)\vec{i} + (y^2 + x^2y)\vec{j}$ is irrotational and find a scalar potential φ such that $\overline{F} = \nabla\phi$ — 7 Marks

b) Verify Green's Theorem for $\oint_c (xy + y^2)dx + x^2dy$, where C is bounded by $y = x$ and $y = x^2$. — 7 Marks

(OR)

10 a) Use Gauss divergence theorem to evaluate $\iint_S \overline{A} \cdot d\overline{S}$ where $A = x^3\bar{i} + y^3\bar{j} + z^3\bar{k}$ and S is the surface of the sphere $\boldsymbol{x^2 + y^2 + z^2 = a^2}$. — 7 Marks

b) A vector field is given by $F = (x^2 - y^2 + x)\bar{i} - (2xy + y)\bar{j}$. Show that the field F is irrotational and find its scalar potential. — 7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

I B.Tech (SVEC14) Supplementary Examinations February – 2021

MATHEMATICAL METHODS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Discuss the solutions of the system of equations $2x + 3ky + (3k + 4)z = 0$; $x + (k + 4)y + (4k + 2)z = 0$; $x + 2(k + 1)y + (3k + 4)z = 0$ for all values of k — 7 Marks

b) Using Cayley Hamilton theorem find A^{-1} where $A = \begin{bmatrix} 2 & 1 & -1 \\ 0 & 2 & 1 \\ 5 & 2 & -3 \end{bmatrix}$ — 7 Marks

(OR)

2 a) Find the eigen values and eigen vectors of the matrix $\begin{bmatrix} 3 & 2 & 2 \\ 1 & 2 & 2 \\ -1 & -1 & 0 \end{bmatrix}$ — 7 Marks

b) Reduce the quadratic form $7x^2 + 6y^2 + 5z - 4xy - 4yz$ to the canonical form and find its rank, index and signature. — 7 Marks

UNIT-II

3 a) Find a real root of the equation $x^3 - x - 11 = 0$ by bisection method. — 7 Marks

b) Fit a straight line of the form y = a + bx for the following data — 7 Marks

x	0	5	10	15	20	25
y	12	15	17	22	24	30

(OR)

4 a) Find a real root of the equation $x \log_{10} x = 1.2$ lying between 2 and 3 by Regula-falsi method, correct to four decimal places. — 7 Marks

b) Find the positive root of $x^4 - x = 10$ correct to three decimal places, using Newton-Raphson method. — 7 Marks

UNIT-III

5 a) The following data gives the velocity of a particle for 20 seconds at an interval of 5 seconds. Find the initial acceleration using the entire data; — 7 Marks

Time t (sec):	0	5	10	15	20
Velocity V(m/sec)	0	3	14	69	228

b) Solve $y' = x + y$, given $y(1) = 0$. Find $y(1.1)$ and $y(1.2)$ by Taylor's series method. Also, compare the result with its exact value. — 7 Marks

(OR)

6 a) Find the first and second derivatives of the function tabulated below at the point 1.1 — 7 Marks

x :	1.0	1.2	1.4	1.6	1.8	2.0
y :	0	0.128	0.544	1.296	2.432	4.000

b) Use fourth order Runge-Kutta method to find — 7 Marks
y at x = 0.1, given that $dy/dx = 3e^x + 2y$, $y(0) = 0$ and $h = 0.1$

UNIT-IV

7 a) Find the half-range Sine series for the function $f(x) = x - x^2$, $0 < x < 1$. 7 Marks

b) Find $Z^{-1}\left[\frac{z^2 - 3}{(z+2)(z^2+1)}\right]$. 7 Marks

(OR)

8 a) Find the Fourier series of the function: $f(x) = \begin{cases} 0, when - \pi < x < 0 \\ Sinx, when 0, x < \pi \end{cases}$ 7 Marks

b) Solve the difference equation: $u_{x+2} + u_x = 5(2^x)$, given that $u_0 = 1$ and $u_1 = 0$ 7 Marks

.

UNIT-V

9 a) Find the partial differential equation of all spheres whose centers lie on the z-axis. 5 Marks

b) Solve the equation $\frac{\partial u}{\partial t} = \frac{\partial^2 u}{\partial x^2}$ with boundary conditions $u(x,0) = 3 \sin n\pi x$, $u(0,t) = 0$ and $u(1,t) = 0$, where $0 < x < 1$, $t > 0$. 9 Marks

(OR)

10 An insulated rod of length has its ends A and B maintained at 0^0 C and 100^0 C respectively until steady state condition prevails. If B is suddenly reduced to 0^0 C and maintained at 0^0 C. Find the temperature at a distance x from A at time t. 14 Marks

CODE No.:14BT1ES01 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

I B.Tech (SVEC14) Supplementary Examinations February – 2021

PROGRAMMING IN C AND DATA STRUCTURES

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Draw a flow chart that to find the reverse of a given number.	7 Marks
	b)	What is a Compiler? Differences between Compiler and an Interpreter.	7 Marks
		(OR)	
2	a)	Explain the structure of C program.	7 Marks
	b)	What is a datatype? Discuss C datatypes.	7 Marks

UNIT-II

3	a)	Discuss various single character input and output functions.	7 Marks
	b)	Differentiate between pretest and post test loops.	7 Marks
		(OR)	
4	a)	Write a program to check whether a number is a power of 2 or not.	7 Marks
	b)	Discuss the need for nested loop. Explain any one scenario with C code.	7 Marks

UNIT-III

5	a)	Derive the expression for finding the address of any element of a 1-dimensional array for any data type.	7 Marks
	b)	Define Recursion. Write a C program to print Fibonacci sequence using recursion.	7 Marks
		(OR)	
6	a)	Differentiate between call by value and call by reference with suitable program.	7 Marks
	b)	Demonstrate quick sort with a program.	7 Marks

UNIT-IV

7	a)	Comprehend how command line arguments can be passed and used.	7 Marks
	b)	Discuss array of pointers and array of pointers as formal parameter.	7 Marks
		(OR)	
8	a)	What is the difference between structure and union? Give example program.	7 Marks
	b)	Write a program to copy one existing fie into other named file.	7 Marks

UNIT-V

9	a)	Compare linked list with array. List the merits and demerits of linked list.	7 Marks
	b)	Explain operations performed on doubly linked list.	7 Marks
		(OR)	
10	a)	What is queue? Discuss all its variants.	7 Marks
	b)	Discuss tree as a data structure. Explain its applications in detail.	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

I B.Tech (SVEC14) Supplementary Examinations February – 2021

ENGINEERING MECHANICS
[Civil Engineering, Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Reduce the following forces into single force and couple acting at the origin. 14 Marks

F_1 = 200N passing through (2,3) and (4,5)
F_2 = 400N passing through (-2,3) and (3,4)
F_3 = 600N passing through (2,-3) and (4,0)

(OR)

2 a) State laws of dry friction. 4 Marks

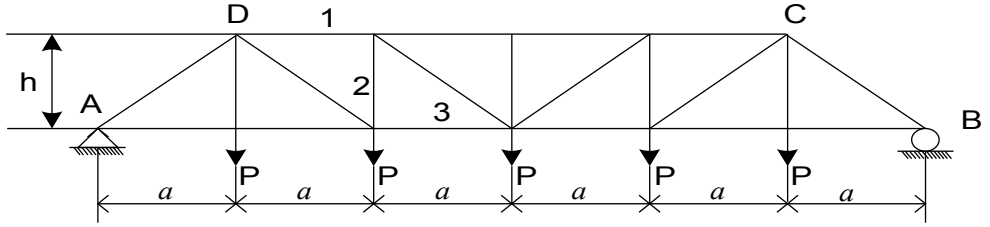
b) A screw jack has square threads of mean diameter 6cm, helix angle 10^0 and coefficient of friction 0.3. Determine the force that must be applied to the end of 60cm lever to raise a weight of 3000N. 10 Marks

UNIT-II

3 A simply supported beam AB of 7m span is subjected to (i) 4KN-m clockwise couple at 2m from A, (ii) 8KN-m anti-clockwise couple at 5m from A and (iii) a triangular load with zero intensity at 2m from A increasing at 4KN/m at a point 5m from A. Determine the reactions at A and B. 14 Marks

(OR)

4 Using the method of sections, determine the forces in bars 1,2 and 3 of the plane truss loaded and supported as shown in the figure. 14 Marks



UNIT-III

5 Determine the Second moment area of an unsymmetrical I-section about two orthogonal axes passing through the centroid. Overall height of the section is 400mm, Top flange is 150mm wide and 10mm thick and the bottom flange is 200mm wide and 10mm thick. Web thickness is 12mm. 14 Marks

(OR)

6 State theorems of Pappus and hence find the total surface area of a frustum of a hollow cone of height 40mm, base outer radius and inner radius 100mm and 40mm respectively and top outer radius and inner radius 60mm and 40mm respectively. (inner face of the cone is vertical) 14 Marks

UNIT-IV

7 A bullet of mass 0.5kg moving with a speed of 30m/sec was fired into a wooden block of weight 200N, resting on an incline and inclined 30^0 to the horizontal. If the coefficient of friction is 0.35, find the distance the block travels along the incline in the upward direction 14 Marks

(OR)

8 The motion of a particle is given by $x = 2(t+1)^2$ and $y = 2(t+1)^{-2}$ determine the velocity and acceleration of the particle at t = 0 and at t = 1sec. 14 Marks

UNIT-V

9 A circular rotating disc of mass ***m*** and radius of gyration ***i*** has a clockwise angular speed of magnitude $\mathbf{w_0}$ when it is placed on the horizontal floor. Assuming a coefficient of friction **μ** at contiguous surface, determine the expression for time when skidding stops and rolling starts. 14 Marks

(OR)

10 a) Derive the expressions for velocity and acceleration of a particle subjected to a force as a function of velocity. 7 Marks

b) Explain the equations of equilibrium of a rigid body experiencing a planar motion. 7 Marks

CODE No.:14BT1BS01 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

I B.Tech (SVEC14) Supplementary Examinations January – 2022

ENGINEERING PHYSICS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What are the characteristics of Lasers?	6 Marks
	b)	Explain the Semiconductor Laser construction with neat diagram.	8 Marks
		(OR)	
2	a)	Write the Sabine's formula for reverberation time.	6 Marks
	b)	Explain the basic requirements of acoustically good hall.	8 Marks

UNIT-II

3	a)	What is absorption coefficient of sound? Explain the method of measurement of sound absorption coefficient.	4 Marks
	b)	How can you deduce Sabine's formula for the reverberation time of an auditorium?	10 Marks
		(OR)	
4	a)	Derive an expression for length contraction from Lorentz transformation equations.	7 Marks
	b)	Derive Einstein's Mass-Energy equivalence relation.	7 Marks

UNIT-III

5	a)	Describe the various Scattering source of electrical resistance in metals.	6 Marks
	b)	Derive and explain Fermi-Dirac distribution.	8 Marks
		(OR)	
6	a)	Discuss the electron in a periodic potential.	8 Marks
	b)	Explain the origin of energy band formation in solids.	6 Marks

UNIT-IV

7	a)	Explain electronic polarization in atoms and obtain an expression for electronic polorizability in terms of the radius of the atom.	8 Marks
	b)	Explain the important characteristics of ferroelectric materials.	6 Marks
		(OR)	
8	a)	Derive an expression for the number of electrons per unit volume in the conduction band of an intrinsic semiconductor.	9 Marks
	b)	Describe LED.	5 Marks

UNIT-V

9	a)	Define magnetic moment. Explain the origin of magnetic moment at the atomic level.	9 Marks
	b)	Explain clearly difference between hard and soft magnetic materials.	5 Marks
		(OR)	
10	a)	Describe the BCS theory of superconductivity.	10 Marks
	b)	Mention any four applications of super conductivity.	4 Marks

CODE No.:14BT1BS02 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

I B.Tech (SVEC14) Supplementary Examinations January - 2022

ENGINEERING CHEMISTRY

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Distinguish between smectic, nematic and cholesteric liquid crystal types with suitable examples.	7 Marks
	b)	Define electrochemical sensors. Write important applications of electrochemical sensors.	7 Marks
		(OR)	
2	a)	Write different types of conducting polymers and give their important engineering applications.	7 Marks
	b)	Write different types of composites and their applications.	7 Marks

UNIT-II

3	a)	What is meant by hardness of water? What are its units and write interrelation between them.	7 Marks
	b)	Define scale and sludge. How it will be overcome?	7 Marks
		(OR)	
4	a)	Describe the estimation of hardness of water by EDTA method.	7 Marks
	b)	What is meant by sterilization of water? Explain how sterilization of water is carried out by using chlorination.	7 Marks

UNIT-III

5	a)	Explain a method to control corrosion.	7 Marks
	b)	Explain how energy is produced in proton exchange membrane fuel cells.	7 Marks
		(OR)	
6	a)	Write chemistry involved in Eco friendly battery.	8 Marks
	b)	Explain different types of corrosion.	6 Marks

UNIT-IV

7	a)	Explain the following properties of lubricants: i) Flash and fire points. ii) Cloud and pour points.	7 Marks
	b)	Write the characteristics of a good fuel.	7 Marks
		(OR)	
8	a)	Give distinguishing features of octane and cetane number. What are the structural factors that promote their high value?	8 Marks
	b)	Define lubricants. Give an account of physical and chemical tests of lubricants.	6 Marks

UNIT-V

9	a)	Explain the chemical vapour deposition for the preparation of nano materials.	7 Marks
	b)	Discuss the tools that are involved in green chemistry.	7 Marks
		(OR)	
10	a)	Explain the applications of Nano materials in carbon nano tubes.	7 Marks
	b)	Discuss the principles of Green Chemistry with examples.	7 Marks

❀ ❀ ❀

CODE No.:14BT1BS03 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

I B.Tech (SVEC14) Supplementary Examinations January – 2022

ENGINEERING MATHEMATICS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Solve $(3y + 2x + 4)dx - (4x + 6y + 5)dy = 0$ 7 Marks

b) Find the orthogonal trajectories of the family circles $x^2 + y^2 = ax$. 7 Marks

(OR)

2 a) Solve: $y'' + 4y' + 4y = 3\sin x + 4\cos x$, $y(0) = 1$ and $y'(0) = 0$. 7 Marks

b) Find the orthogonal trajectories of the cardioids $r = a(1 - \cos\theta)$. 7 Marks

UNIT-II

3 a) Express equation $\frac{\partial^2 y}{\partial x^2} + \frac{\partial^2 y}{\partial y^2} = 0$ in polar form (r, θ). 7 Marks

b) Show that the rectangular solid of maximum volume that can be inscribed in a sphere is cube. 7 Marks

(OR)

4 a) Trace the curve $a^2y^2 = x^2(a^2 - x^2)$. 7 Marks

b) Find the radius of curvature at any point of the cardioid $r = a(1 - \cos\theta)$. 7 Marks

UNIT-III

5 a) Find the area of the segment cut off from the parabola $x^2 = 8y$ by the line $x - 2y+8=0$. 7 Marks

b) Find the length of an arc of the curve y=log sec x between θ = 0 and π/3. 7 Marks

(OR)

6 a) Change the order of integration in $\int_0^a \int_0^a \frac{x\,dy\,dx}{x^2 + y^2}$ and hence evaluate it. 7 Marks

b) Evaluate $\iiint_V (x + y + z)\,dxdydz$ where V volume of the cylinder $x^2 + y^2 = 1$, $z = 0$ and $z = 4$ by transforming into cylindrical coordinates. 7 Marks

UNIT-IV

7 a) Find the Laplace transform of (i) $\cos^3 4t$ (ii) $e^{-3t}.t^2.\sin(t)$. 7 Marks

b) Solve $y''+ 2y'+y = 3x.e^{-x}$ given $y(0)=4$, $y'(0)=0$. 7 Marks

(OR)

8 a) Solve $y'' + 2y' - 3y = \sin t$ such that $y'(0) = 0$ *and* $y(0) = 0$. 7 Marks

b) Find the Laplace transform of *(i)*$\cos^3 2t$ *(ii)* $e^{-2t}\cosh 3t$. 7 Marks

UNIT-V

9 a) A vector field is given by $A = \left(x^2 + xy^2\right)\hat{i} + \left(y^2 + yx^2\right)\hat{j}$. Show that the field is irrotational, and find the scalar potential. 7 Marks

b) Find the work done in moving a particle in the force field $\bar{F} = 3x^2 i + (2xz - y)j + zk$, along the straight line from (0, 0, 0) to (2, 1, 3). 7 Marks

(OR)

10 a) Use Gauss divergence theorem to evaluate $\iint_S \bar{A} \cdot d\bar{S}$ where $A = x^3\bar{i} + y^3\bar{j} + z^3\bar{k}$ and S is the surface of the sphere $x^2 + y^2 + z^2 = a^2$. 7 Marks

b) A vector field is given by $F = (x^2 - y^2 + x)\bar{i} - (2xy + y)\bar{j}$. Show that the field F is irrotational and find its scalar potential. 7 Marks

CODE No.:14BT1BS04 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

I B.Tech (SVEC14) Supplementary Examinations January – 2022

MATHEMATICAL METHODS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Find the rank of the matrix $\begin{bmatrix} 1 & 2 & 3 & 0 \\ 2 & 4 & 3 & 2 \\ 3 & 2 & 10 & 3 \\ 6 & 8 & 7 & 5 \end{bmatrix}$ by reducing it into normal form. 7 Marks

b) Verify Cayley –Hamilton Theorem for the matrix $\begin{bmatrix} 1 & 1 & 3 \\ 1 & 3 & -3 \\ -2 & -4 & -4 \end{bmatrix}$. 7 Marks

(OR)

2 a) Find the eigen values and eigen vectors of the matrix $\begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$. 7 Marks

b) Reduce the quadratic form $3x^2 + 5y^2 + 3z^2 - 2xy - 2yz + 2zx$ to the canonical form and find its rank, index and signature 7 Marks

UNIT-II

3 a) Find an approximate root of the equation $x^3 - 3x - 5 = 0$, using Newton-Raphson method and correct to four decimal places. 7 Marks

b) Fit a parabola $y = a + bx + cx^2$ to the following data. 7 Marks

x :	2	4	6	8	10
y :	3.07	12.85	31.47	57.38	91.29

(OR)

4 a) Estimate the value of f(3.5) from the following data 7 Marks

x :	3	4	5	6	7	8	9
f(x) :	2.7	6.4	12.5	21.6	34.3	51.2	72.9

b) Define forward, backward , central difference operators 7 Marks

UNIT-III

5 a) The distance covered by an athlete for the 50 metre is given in the following table: Time(sec): 0 1 2 3 4 5 6 Distance (metre) 0 2.5 8.5 15.5 24.5 36.5 50. Determine the speed of the athlete at t = 5 sec. correct to two decimals. 7 Marks

b) Solve $y' = x + y$, given $y(1) = 0$. Find $y(1.1)$ and $y(1.2)$ by Taylor's series method. Also, compare the result with its exact value. 7 Marks

(OR)

6 a) A curve passes through the points (0, 23), (0.5, 19), (1, 14), (1.5, 11), (2, 12.5), (2.5, 16), (3, 19), (3.5, 20) and (4, 20). Obtain the area bounded by the curve, the x – axis and the extreme ordinates. 7 Marks

b) Using modified Euler's method, determine y(0.4) in steps of 0.2, given that y = 1 at x = 0. 7 Marks

UNIT-IV

7 a) Obtain the Half Range Cosine series for $x \sin x$ in $(0, \pi)$. 7 Marks

b) Find the Fourier Cosine transform of $f(x) = \frac{1}{1+x^2}$. 7 Marks

(OR)

8 a) Find $Z^{-1}\left(\frac{z}{(z-2)(z-3)}\right)$ using Convolution theorem. 7 Marks

b) Find the Fourier series to represent function $f(x) = |x|, -\pi < x < \pi$. 7 Marks

UNIT-V

9 a) Find the differential equation of all spheres whose centers lie on the Z-axis. 7 Marks

b) A rod of length ***l*** with insulated sides is initially at a uniform temperature u_0. Its ends are suddenly cooled to 0^0C and are kept at that temperature. Find the temperature function u(x, t). 7 Marks

(OR)

10 An insulated rod of length has its ends A and B maintained at 0^0 C and 100^0 C respectively until steady state condition prevails . If B is suddenly reduced to 0^0 C and maintained at 0^0 C. Find the temperature at a distance x from A at time **t**. 14 Marks

CODE No.:14BT1ES01 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

I B.Tech (SVEC14) Supplementary Examinations January – 2022

PROGRAMMING IN C AND DATA STRUCTURES

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Differentiate compiler and interpreter.	7 Marks
	b)	Draw the flow chart for finding the maximum of three numbers.	7 Marks
		(OR)	
2	a)	What is an identifier? Write the algorithm for checking whether the given number is prime or not.	8 Marks
	b)	Explain in detail about any three input and output statements used in C language.	6 Marks

UNIT-II

3	a)	Describe formatted input in scanf function.	7 Marks
	b)	Write a program to convert a decimal number into any base.	7 Marks
		(OR)	
4	a)	Discuss multiway selection statement with an example program.	7 Marks
	b)	How to construct an infinite loop using while loop, for loop?	7 Marks

UNIT-III

5	a)	What is an array? Discuss its declaration. How to initialize multidimensional array?	7 Marks
	b)	Write a program to print binary equivalent of a decimal number using array.	7 Marks
		(OR)	
6	a)	How functions help in handling complexity of problem solving? Explain.	7 Marks
	b)	Write a C program to reverse a string with out using library function.	7 Marks

UNIT-IV

7	a)	Give the syntax with suitable programs for dynamic memory allocation functions available in C.	7 Marks
	b)	Illustrate the differences between structures and unions.	7 Marks
		(OR)	
8	a)	Demonstrate how to declare, open, process and close the files in C using a C program.	7 Marks
	b)	Explain the concept of pointer to pointers with examples.	7 Marks

UNIT-V

9	a)	Illustrate stack data structure based on lists.	7 Marks
	b)	State and discuss on binary tree traversals with an example.	7 Marks
		(OR)	
10	a)	Write the steps with illustrative figures involved in the following operations of a singly linked list without the head node. i) Delete the first element. ii) Delete the last element. iii) Delete before a given element. iv) Delete after a given element.	7 Marks
	b)	Define tree and explain binary search tree.	7 Marks

CODE No.: 20BT1BS01 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Supplementary Examinations September – 2021

DIFFERENTIAL EQUATIONS AND MULTIVARIABLE CALCULUS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering, Computer Science and Business Systems, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Science)]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Solve the differential equation $(D-2)^2 = 8(e^{2x} + \sin 2x)$.	7 Marks	L3	CO1	PO1
	b)	Solve the differential equation $(D^2 - 3D + 2)y = 2$.	7 Marks	L3	CO1	PO1
		(OR)				
2.	a)	Solve the differential equation $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = xe^x \sin x$.	7 Marks	L3	CO1	PO2
	b)	Solve the following differential equation by the method of variation of parameters $y'' - 6y' + 9y = \frac{e^{3x}}{x^2}$.	7 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Construct the partial differential equation by eliminating the arbitrary function ϕ from $\phi(xy + z^2, x + y + z) = 0$.	7 Marks	L3	CO1	PO1
	b)	Solve the partial differential equation $x^2(y-z)p + y^2(z-x)q = z^2(x-y)$.	7 Marks	L3	CO1	PO2
		(OR)				
4.	a)	Construct the partial differential equation by eliminating the arbitrary functions f and ϕ from $z = yf(x) + x\phi(y)$.	7 Marks	L3	CO1	PO1
	b)	Solve the linear homogeneous partial differential equation $\frac{\partial^2 z}{\partial x^2} - \frac{\partial^2 z}{\partial x \partial y} = \sin x \cos 2y$.	7 Marks	L3	CO1	PO2

UNIT-III

5.	a)	Show that $\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + \frac{\partial u}{\partial z} = 0$, if $u = f(y-z, z-x, x-y)$.	7 Marks	L2	CO2	PO1
	b)	Using Lagrange's method of undetermined multipliers, find the minimum value of $x^2 + y^2 + z^2$ subject to the condition $x+y+z=1$.	7 Marks	L3	CO2	PO2
		(OR)				
6.	a)	If $x = e^r \sec\theta$, $y = e^r \tan\theta$ then show that $\frac{\partial(x,y)}{\partial(r,\theta)} \times \frac{\partial(r,\theta)}{\partial(x,y)} = 1$.	7 Marks	L2	CO2	PO1
	b)	Find the dimensions of the rectangular box requiring least material for its construction when the box is open at the top is to	7 Marks	L1	CO2	PO2

have a volume of 32 cubic feet.

UNIT-IV

7.	a)	Evaluate $\int\int_R y\,dx\,dy$ where R is the region bounded by the first quadrant of the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$.	7 Marks	L5	CO2	PO2
	b)	Evaluate $\int_{-1}^{1}\int_{0}^{z}\int_{x-z}^{x+z}(x+y+z)\,dy\,dx\,dz$.	7 Marks	L5	CO2	PO1
		(OR)				
8.	a)	By changing the order of integration, evaluate $\int_{0}^{16}\int_{\sqrt{x}}^{4}\cos y^3\,dy\,dx$.	7 Marks	L2	CO2	PO2
	b)	Evaluate $\int_{0}^{a}\int_{0}^{\sqrt{a^2-x^2}} y\sqrt{x^2+y^2}\,dy\,dx$ by transforming into polar coordinates.	7 Marks	L5	CO2	PO2

UNIT-V

9.	a)	Find $div\overline{F}$ *and* $curl\overline{F}$ where $\overline{F}$ = $grad\,(x^3+y^3+z^3-3xyz)$.	7 Marks	L1	CO3	PO1
	b)	Find the directional derivative of $f(x,y,z)=x^2-y^2+2z^2$ at the point P(1,2,3) in the direction of the line PQ where Q is the point (5,0,4).	7 Marks	L1	CO3	PO1
		(OR)				
10.		Verify Green's theorem for $\int_C (xy+y^2)\,dx+x^2\,dy$, where c is bounded by y = x and y = x^2.	14 Marks	L5	CO3	PO2

CODE No.: 20BT1BS02 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Supplementary Examinations September – 2021

ENGINEERING CHEMISTRY

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Describe the zeolite process used for softening of water with a neat diagram and mention its limitations.	8 Marks	L2	CO1	PO1
	b)	Discuss the effect of fluorides present in drinking water on human health.	6 Marks	L2	CO1	PO6
		(OR)				
2.	a)	Explain reverse osmosis process used for desalination of brackish water and mention its advantages.	7 Marks	L2	CO1	PO1
	b)	0.50 g of $CaCO_3$ was dissolved in HCl and the solution made up to 1 Liter with distilled water. 50mL of the solution required 20mL of EDTA solution for titration. 50mL of hard water sample required 15mL of EDTA and after boiling and filtering required 10mL of EDTA solution. Calculate permanent and temporary hardness of water.	7 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Derive the expression for Schrodinger wave equation and explain the significance of Ψ and Ψ^2.	7 Marks	L3	CO2	PO1
	b)	Predict the magnetic behavior and calculate the bond order of $\mathbf{O_2}$ molecule based on its energy level diagram.	7 Marks	L3	CO2	PO2
		(OR)				
4.	a)	Discuss the Postulates of molecular orbital theory.	10 Marks	L2	CO2	PO1
	b)	Identify and draw the shapes of the following molecules using VSEPR theory, i) XeF_4 ii) NH_3 iii) BrF_5 and iv) ClF_3.	4 Marks	L3	CO2	PO2

UNIT-III

5.	a)	Define battery. Explain the construction and working principle of Lithium ion battery.	8 Marks	L2	CO3	PO1
	b)	Discuss how underground pipelines and cables can be protected from corrosion.	6 Marks	L2	CO3	PO2
		(OR)				
6.	a)	Discuss the construction and working of H_2-O_2 fuel cell and identify its advantages and limitations.	7 Marks	L2	CO3	PO1
	b)	Define corrosion and explain galvanic corrosion with examples.	7 Marks	L2	CO3	PO1

UNIT-IV

7.	a)	Write the principle and applications of Scanning Electron Microscope.	7 Marks	L1	CO4	PO1
	b)	Explain different types of fundamental modes of vibrations.	7 Marks	L2	CO4	PO1
		(OR)				

8.	a)	Define the terms auxochrome, chromophore and explain their significance.	7 Marks	L2	CO4	PO1
	b)	State the principle of Transmission Electron Microscope and explain its applications.	7 Marks	L1	CO4	PO1

UNIT-V

9.	a)	Describe the Fischer-Tropsch method with a neat diagram and write the advantages, disadvantages of synthetic petrol.	9 Marks	L2	CO5	PO1
	b)	Calculate the HCV and LCV of coal having the following compositions; carbon = 70%, hydrogen = 20%, nitrogen = 7%, sulphur = 1% and ash = 3%, latent heat of steam = 585 kcal/kg.	5 Marks	L3	CO5	PO2
		(OR)				
10.	a)	Discuss about solid lubricants with suitable examples.	7 Marks	L2	CO5	PO1
	b)	Define lubricant and explain the characteristic functions of lubricants.	7 Marks	L2	CO5	PO1

CODE No.: 20BT1BS03 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Supplementary Examinations September – 2021

ENGINEERING PHYSICS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Science)]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	What are Newton's rings?	2 Marks	L1	CO1	PO1
	b)	Describe the formation of Newton's rings in reflected light and hence prove that in reflected light, the diameters of the dark rings are proportional to the square root of natural numbers.	12 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Interpret the Fraunhofer diffraction pattern due to a double slit with relevant diagrams.	8 Marks	L2	CO1	PO1
	b)	Illustrate the use of Nicol prism as a polarizer with a suitable diagram.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.		Recall Maxwell's equations in integral and differential forms and write the physical significance of each equation.	14 Marks	L1	CO2	PO1
		(OR)				
4.	a)	Classify optical fibers based on number of modes and refractive index.	8 Marks	L2	CO2	PO1
	b)	Explain with a neat block diagram, the principle of optical fiber communication system.	6 Marks	L2	CO2	PO1
		UNIT-III				
5.	a)	Outline the differences between intrinsic and extrinsic semiconductors.	2 Marks	L2	CO3	PO1
	b)	Derive an expression for the Hall coefficient of a p-type semiconductor in terms of hall voltage.	12 Marks	L3	CO3	PO2
		(OR)				
6.	a)	Compare direct and indirect band gap semiconductors.	2 Marks	L2	CO3	PO1
	b)	Describe the construction and working of a semiconductor laser diode with relevant diagrams.	10 Marks	L2	CO3	PO1
	c)	Calculate the wavelength of laser light emitted by a GaAs laser of band gap 1.44 eV.	2 Marks	L3	CO3	PO2
		UNIT-IV				
7.	a)	Explain the dependence of various polarization mechanisms on the frequency of the applied field.	6 Marks	L2	CO4	PO1
	b)	Discuss the different types of polarization mechanisms involved in dielectric materials.	8 Marks	L2	CO4	PO1
		(OR)				
8.	a)	Classify magnetic materials.	6 Marks	L2	CO4	PO1
	b)	Differentiate soft and hard magnetic materials.	8 Marks	L2	CO4	PO1

UNIT-V

9.	a)	Outline BCS theory of superconductivity.	8 Marks	L2	CO5	PO1
	b)	State Meissner effect and show that all superconductors exhibit diamagnetic property.	6 Marks	L1	CO5	PO1
		(OR)				
10.	a)	Explain with a necessary diagram, the synthesis of nanomaterial using pulsed laser deposition technique.	6 Marks	L2	CO5	PO1
	b)	List the physical, magnetic and optical properties of a nanomaterial.	6 Marks	L1	CO5	PO1
	c)	Summarize the applications of nanomaterials.	2 Marks	L2	CO5	PO1

CODE No.: 20BT1BS04 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Supplementary Examinations September – 2021

APPLIED PHYSICS

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define critical angle. Develop an expression for acceptance angle of an optical fiber.	10 Marks	L3	CO1	PO1
	b)	Calculate the refractive indices of the core and cladding material of a fiber if numerical aperture is 0.20 and refractive index difference $\Delta = 0.0415$.	4 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Discuss the construction and working of an optical fiber.	10 Marks	L2	CO1	PO1
	b)	Identify any four applications of fiber optic sensors.	4 Marks	L3	CO1	PO1

UNIT-II

3.	a)	Recall absorption co-efficient with its units. Outline the basic requirements for an acoustically good hall.	12 Marks	L2	CO1	PO1
	b)	A cinema hall has a volume of 7500m^3. What should be the total absorption in the hall if the reverberation time of 1.5 sec is to be maintained?	2 Marks	L1	CO1	PO2
		(OR)				
4.	a)	Explain the production of ultrasonic waves using magnetostriction method with a neat diagram. List any two draw backs of this method.	9 Marks	L2	CO1	PO1
	b)	Choose any five important applications of ultrasonics.	5 Marks	L3	CO1	PO1

UNIT-III

5.		Define instantaneous velocity. Explain with sketches the construction and uses of i) displacement–time graph, ii) velocity–time graph and iii) acceleration-time graph.	14 Marks	L2	CO2	PO1
		(OR)				
6.	a)	Define terms work, energy and power with units.	6 Marks	L1	CO2	PO1
	b)	State and derive the work–energy principle.	8 Marks	L3	CO2	PO2

UNIT-IV

7.	a)	Select any three modes of heat transfer and explain.	7 Marks	L2	CO2	PO1
	b)	Derive the expression for effective thermal conductivity through compound media in series.	7 Marks	L3	CO2	PO2
		(OR)				
8.	a)	Describe the method to determine the thermal conductivity of a bad conductor using Lee's disc method.	10 Marks	L2	CO2	PO1
	b)	Predict how much heat will be conducted through a slab of area $90 \times 10^{-4} m^2$ and thickness $1.2 \times 10^{-3} m$ in one second when its opposite faces is maintained at difference in temperature of 20 K. The co-efficient of thermal conductivity of that material is $0.04 Wm^{-1}K^{-1}$.	4 Marks	L3	CO2	PO2

UNIT-V

9.	a)	Describe the preparation of metallic glasses using RF Sputtering technique.	10 Marks	L2	CO3	PO1
	b)	Select few applications of metallic glasses.	4 Marks	L3	CO3	PO1
		(OR)				
10.	a)	What is Shape Memory Alloy? Classify the Shape Memory Alloys with its characteristics.	8 Marks	L2	CO3	PO1
	b)	List few applications of Shape Memory Alloys.	6 Marks	L1	CO3	PO1

CODE No.: 20BT1HS01 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Supplementary Examinations September – 2021

COMMUNICATIVE ENGLISH

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Science) Computer Science and Business Systems

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Correlating verbal and non-verbal communication makes communication 100% effective. Explain.	7 Marks	L2	CO4	PO10
	b)	Discuss briefly the importance of LSRW skills.	7 Marks	L2	CO2	PO2
		(OR)				
2.		Define Communication and explain the importance of communicating in English.	14 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Explain, how listening is more important than hearing.	7 Marks	L2	CO2	PO2
	b)	Discuss how to overcome the barriers to listening.	7 Marks	L2	CO2	PO2
		(OR)				
4.		Analyze the traits of a good listener that helps develop an attitude of tolerance and understanding.	14 Marks	L4	CO2	PO2
		UNIT-III				
5.	a)	Paralinguistic communication refers to the study of human voice and how words are spoken. Explain the characteristic nuances of voice.	7 Marks	L2	CO1	PO1
	b)	Discuss, how effective speaking, the most frequently required skill, is different from professional situation to social situation.	7 Marks	L2	CO2	PO2
		(OR)				
6.		Confidence, clarity and fluency in speeches should be evident in content, presentation style and in handling of the audience. Illustrate.	14 Marks	L2	CO2	PO2
		UNIT-IV				
7.	a)	Explain the concepts called reading rates and reading between the lines with examples.	7 Marks	L2	CO3	PO2
	b)	Explain the purposes and benefits of Intensive, Extensive and Critical reading.	7 Marks	L2	CO3	PO2
		(OR)				
8.		SQ3R reading techniques enable the reader to get an idea about the structure of the text. Discuss.	14 Marks	L2	CO3	PO5
		UNIT-V				
9.	a)	Using right words in the right context is one of the essential elements of effective writing. Explain guidelines which help achieve clarity and economy in writing.	7 Marks	L2	CO3	PO5
	b)	The ability to construct effective sentences adds value to technical documents. Discuss salient points of sentence construction.	7 Marks	L2	CO3	PO5
		(OR)				
10		Illustrate various techniques for a good technical writing.	14 Marks	L2	CO3	PO5

.

CODE No.: 20BT10101 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Supplementary Examinations September – 2021

ENGINEERING MECHANICS

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	State and prove Lami's theorem.	7 Marks	L4	CO1	PO1 PO10
	b)	Determine the reactions at the supports of the given loaded beam shown in the Fig.1.	7 Marks	L4	CO1	PO1 PO2 PO4 PO10

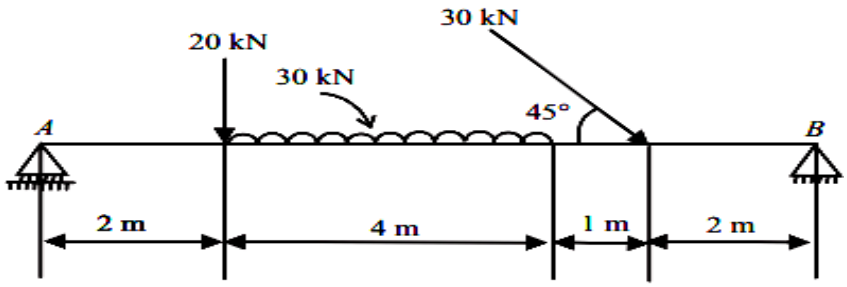


Fig.1

(OR)

2.	a)	What is perfect frame and imperfect frame? Write the advantage of method of sections as compared to method of joints.	4 Marks	L4	CO1	PO1 PO2
	b)	Identify the truss type and determine the forces in all the members of a truss shown in Fig.2 using method of joints.	10 Marks	L4	CO1	PO1 PO2 PO4 PO5 PO6 PO10

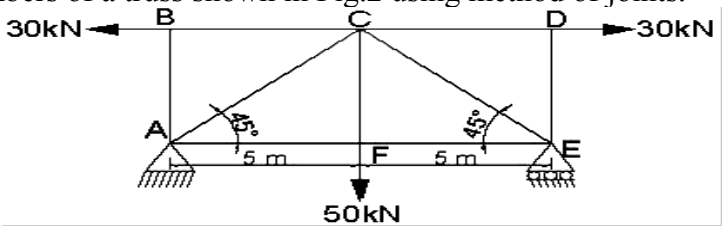


Fig.2

UNIT-II

3.	a)	A ladder 5 m long and of 250 N weight is placed against a vertical wall in a position where its inclination to the vertical is 30^0. A man weighing 800 N climbs the ladder. At what position will he induce slipping? The co-efficient of friction for both the contact surfaces of the ladder with the wall and the floor is 0.2.	7 Marks	L4	CO2	PO1 PO2 PO4 PO6 PO10
	b)	The coefficient of friction between a copper block A and an aluminum block B is 0.3, and between the block B and the floor is 0.2. The weight of block A is 30 N and of block B is 20 N as shown in given Fig.3. What force P will cause the motion of block A to impend?	7 Marks	L4	CO2	PO1 PO2 PO4 PO6 PO10

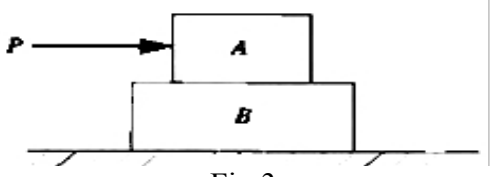


Fig.3

(OR)

4.	a)	What is friction? Explain how friction is both desirable and undesirable in engineering applications and also state the laws of static and dynamic friction.	7 Marks	L2	CO2	PO1
	b)	A body of weight 50 N is placed on a rough horizontal plane. To just move the body on the horizontal plane, a push of 15 N inclined at 30° to the horizontal plane is required. Find the coefficient of friction between the body and the plane.	7 Marks	L4	CO2	PO1 PO2 PO6 PO10

UNIT-III

5.	a)	Define the following: i) Centroid. ii) Centre of gravity. iii) Moment of inertia.	4 Marks	L1	CO3	PO1
	b)	Find the area moment of inertia about the x and y axes of the plane area shown in Fig.4.	10 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO10

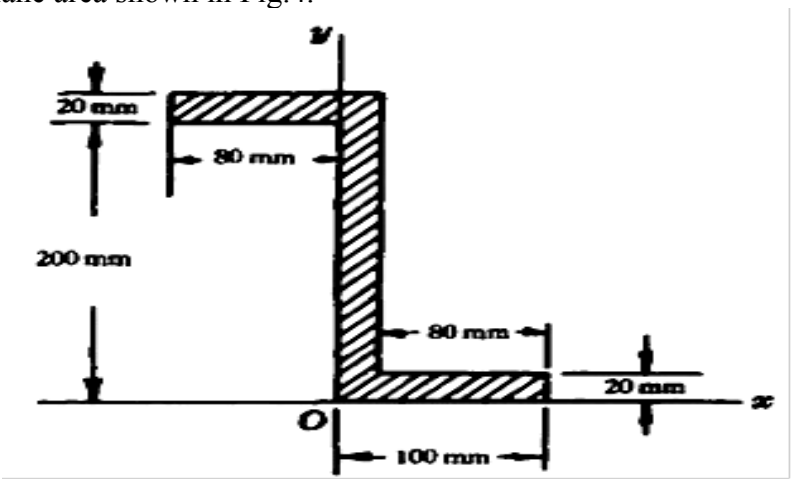


Fig.4

(OR)

6.	a)	State and prove theorems of Pappus–Guldinus.	7 Marks	L2	CO3	PO1 PO2 PO10
	b)	Calculate the centroid of T-section shown in the Fig.5.	7 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO10

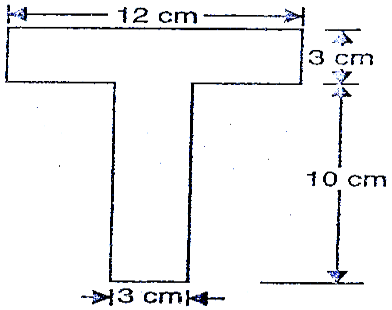


Fig.5

UNIT-IV

7.	a)	A bar of uniform cross sectional area 100mm^2 is subjected to forces as shown in the Fig.6. Calculate the change in the length of the bar. Young's modulus of material is 2 x 10^5 N/mm^2.	7 Marks	L4	CO4	PO1 PO2 PO5 PO10

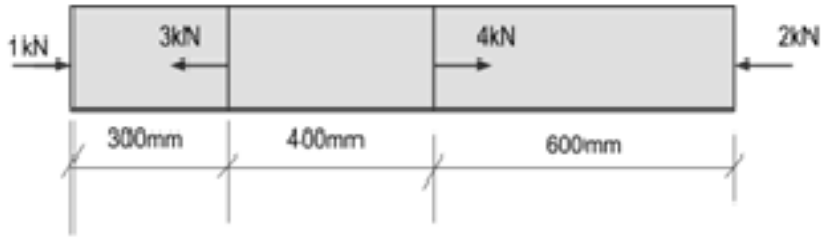


Fig.6

	b)	The following data refer to a mild steel specimen tested in a laboratory. Diameter of the specimen = 20 mm Length of the specimen = 250 mm Extension under a load of 10 kN = 0.035 mm Load at yield point = 120.15 kN Maximum load = 195.50 kN Length of the specimen under failure = 300 mm The neck diameter = 15.25 mm Determine Young's Modulus, Yield point, Ultimate stress, percentage of elongation and percentage reduction in area and safe stress adopting factor of safety of 2.	7 Marks	L4	CO4	PO1 PO2 PO4 PO5 PO6 PO10
		(OR)				
8.	a)	Derive the relationship between Young's modulus and bulk modulus.	7 Marks	L4	CO4	PO1 PO2 PO10
	b)	Compound tube consist of a steel tube 130mm internal diameter and 100mm thickness and an outer brass tube 150mm internal diameter and 100mm thickness. The two tubes are of same length. The compound tube carries an axial load of 950kN. Identify the stresses and the load carried by each tube and the amount it shortens. Length of each tube is 130mm. $E_s = 2 \times 10^5$ N/mm^2 and $E_b = 1 \times 10^5$ N/mm^2.	7 Marks	L4	CO4	PO1 PO2 PO4 PO6 PO10
		UNIT-V				
9.	a)	Derive the circumferential stress and longitudinal stress of a thin cylinder with neat sketch.	7 Marks	L4	CO5	PO1 PO2 PO10
	b)	Calculate the thickness of the metal required for a cast iron main 800mm in diameter for water at a pressure head of 100m, if the maximum permissible tensile stress is 20 MN/m^2 and weight of water is 10 kN/m^3.	7 Marks	L6	CO5	PO1 PO2 PO3 PO4 PO5 PO6 PO10
		(OR)				
10.		Mention the assumptions in Lame's theory. Derive Lame's equation for radial and circumferential stress of thick cylinder.	14 Marks	L4	CO5	PO1 PO2 PO10

CODE No.: 20BT10201 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Supplementary Examinations September – 2021

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

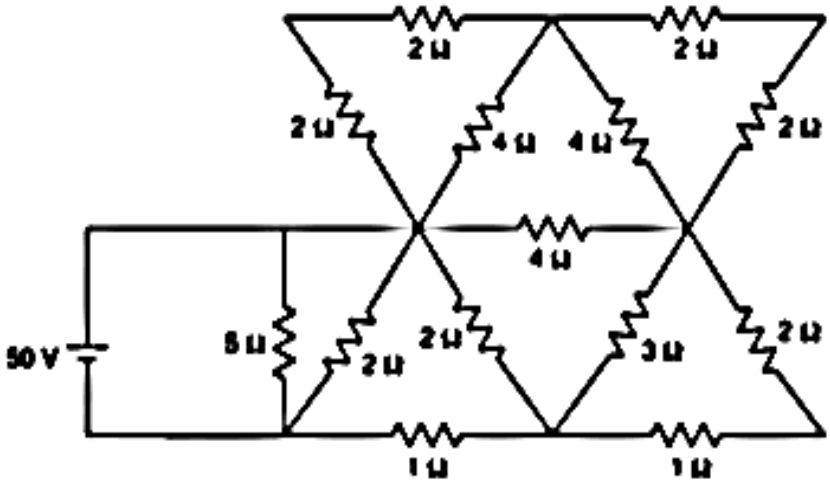
[Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Science)]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	With the help of neat sketch, explain in detail the working of the single loop generator.	7 Marks	L2	CO1	PO1
	b)	Find the current delivered by the source in the network shown below.	7 Marks	L3	CO1	PO2



(OR)

2.	a)	State Kirchhoff's laws and validate the law with suitable examples.	7 Marks	L2	CO1	PO1
	b)	Obtain the RMS and Average values of a sinusoidal voltage of peak V_m and angular frequency ω rad/s.	7 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Is Hydro Power plant a sustainable electrical source of generation? Justify your answer. Also, with neat sketch, explain the operation of hydro power plant.	7 Marks	L2	CO2	PO7
	b)	Explain the functional aspects of a relay.	4 Marks	L2	CO2	PO1
	c)	What are the various BEE standards that a consumer has to look while purchasing any electrical product?	3 Marks	L2	CO2	PO8

(OR)

4.	a)	With neat sketch, explain the operation of sustainable power generation using thermal power plant.	7 Marks	L2	CO2	PO7
	b)	Explain the significance of power factor and enumerate the methods of improving the power factor.	4 Marks	L2	CO2	PO1
	c)	Explain the significance of Energy Efficiency ratio.	3 Marks	L2	CO2	PO8

UNIT-III

5.	a)	With neat sketch, demonstrate the working principle of single phase transformer.	7 Marks	L2	CO3	PO1
	b)	Explain the working principle of Three phase induction motor and mention any one application.	7 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Explain the constructional details of single phase capacitor start and run induction motor.	7 Marks	L2	CO3	PO1
	b)	Explain the working of permanent magnet DC motor and mention any one application.	7 Marks	L2	CO3	PO1

UNIT-IV

7.		Explain the operation of a PN junction diode in forward biased and reverse biased condition. Draw its V-I characteristics.	14 Marks	L2	CO4	PO1
		(OR)				
8.	a)	Distinguish between Half wave Rectifier and full wave rectifier.	7 Marks	L2	CO4	PO2
	b)	What is the need for biasing in transistor operation?	7 Marks	L2	CO4	PO1

UNIT-V

9.	a)	Draw the block diagram of Op-Amp and explain in detail.	7 Marks	L2	CO4	PO1
	b)	In an inverting adder circuit, the input voltages ate 0.3 V, 0.5 V, 0.1 V while $R_1=R_2=R_3=1$ KΩ. If $R_f = 10$ KΩ, calculate the output voltage.	7 Marks	L2	CO4	PO2
		(OR)				
10.	a)	Examine and derive an expression for V_0 of the differentiator circuit by using Op-Amp.	7 Marks	L2	CO4	PO2
	b)	Define Op-Amp and list out the ideal characteristics of ideal Op-Amp.	7 Marks	L1	CO4	PO1

CODE No.: 20BT10301 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Supplementary Examinations September – 2021

MATERIAL SCIENCE AND ENGINEERING

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Describe Burger's vector for the Edge and Screw Dislocation.	7 Marks	L1	CO1	PO1
	b)	List out different type's imperfections in crystals and briefly explain Schottkey, Frenkel defects, Edge and Screw dislocations.	7 Marks	L2	CO1	PO1 PO2
		(OR)				
2.		Draw Iron-Iron-Carbide diagram neatly and explain cooling of steel from Liquid phase to room temperature for 0.4% C and 0.8% C.	14 Marks	L2	CO1	PO1 PO2
		UNIT-II				
3.	a)	Write short notes surface hardening techniques. Explain any two methods with neat sketches.	7 Marks	L1	CO1	PO1 PO2
	b)	Define annealing and recall the types of annealing.	7 Marks	L1	CO1	PO1 PO2
		(OR)				
4.		Differentiate the CCT and TTT diagram. Explain construction method of TTT and CCT diagrams.	14 Marks	L1	CO1	PO1 PO2 PO3
		UNIT-III				
5.	a)	What is the effect of Carbon on the properties of steel? Explain the properties and applications of Low, Medium and High carbon steels.	7 Marks	L2	CO2	PO1 PO2
	b)	What is stainless steel? How they are classified and give their applications?	7 Marks	L1	CO2	PO1 PO2
		(OR)				
6.		Draw the microstructures of Grey cast iron and White cast iron. Also mention its composition, properties and applications.	14 Marks	L3	CO2	PO1 PO2
		UNIT-IV				
7.	a)	Compare brass and bronze materials.	7 Marks	L3	CO2	PO1 PO2
	b)	List the properties and applications of copper.	7 Marks	L1	CO2	PO1 PO2
		(OR)				
8.		What is aluminium? Explain the types, properties and uses of aluminium alloys in detail.	14 Marks	L2	CO2	PO1
		UNIT-V				
9.	a)	Write a brief note on Metal-Matrix Composites (MMCs) and Ceramic-Matrix Composites (CMCs).	7 Marks	L1	CO2	PO1 PO2
	b)	Discuss on the characteristics and classification of polymers.	7 Marks	L1	CO2	PO1 PO2
		(OR)				
10.		Explain classification, properties and applications of polymer matrix composites. Also discuss its effect on environment.	14 Marks	L2	CO2	PO1 PO7

CODE No.: 20BT10341 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Supplementary Examinations September – 2021

BASIC CIVIL AND MECHANICAL ENGINEERING

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Convert the following whole circle bearings to quadrantal bearings: i) 22º30' ii) 50º40' iii) 120º iv) 170º12' v) 211º54' vi) 327º24'	6 Marks	L4	CO1	PO1 PO2 PO10
	b)	Classify bricks based on their quality and explain them briefly.	8 Marks	L4	CO1	PO1 PO2 PO8
		(OR)				
2.	a)	Explain the various laboratory tests on bricks to check their suitability in construction.	6 Marks	L1	CO1	PO1 PO5 PO6
	b)	Define the following: i) Stress. ii) Strain. iii) Young's Modulus. iv) Hooke's law.	8 Marks	L1	CO1	PO1

UNIT-II

3.	a)	Briefly explain the various types of foundation.	7 Marks	L2	CO1	PO1
	b)	What is lintel? Where do you use lintel? Briefly explain different types of lintels used.	7 Marks	L2	CO1	PO1
		(OR)				
4.	a)	Explain the components of a stairs with neat sketch.	7 Marks	L2	CO1	PO1 PO10
	b)	Distinguish between separate and combined systems of sewerage.	7 Marks	L4	CO1	PO1 PO2 PO7

UNIT-III

5.		Explain the working principle of 2 stroke petrol engine with neat sketch	14 Marks	L2	CO2	PO1
		(OR)				
6.		Describe the working principle of double acting reciprocating pump with neat sketch.	14 Marks	L2	CO2	PO1

UNIT-IV

7.		Derive the expression for length of the cross belt drive.	14 Marks	L2	CO2	PO1 PO2
		(OR)				
8.	a)	List the types of gear trains and explain.	7 Marks	L1	CO2	PO1
	b)	Derive the expression for power transmitted by the simple gear train.	7 Marks	L2	CO2	PO1 PO2

UNIT-V

9.		Write a short note on soldering and brazing processes.	14 Marks	L2	CO2	PO1
		(OR)				
10		Give an illustrative explanation of milling process and explain its	14 Marks	L2	CO2	PO1

. working principle.

CODE No.: 20BT11201 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Supplementary Examinations September – 2021

PROGRAMMING FOR PROBLEM SOLVING

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Science), Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	List the data types of C Language. Explain with a neat syntax.	7 Marks	L2	CO1	PO1
	b)	Compare operator precedence and associativity. Demonstrate with a suitable example.	7 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Explain the operators of C Language.	7 Marks	L2	CO1	PO1
	b)	Write a C program to swap the values of two variables without using a third variable.	7 Marks	L3	CO1	PO3
		UNIT-II				
3.	a)	Demonstrate the looping statements with a suitable example.	7 Marks	L2	CO1	PO1
	b)	Write a C program to find the sum of individual digits of a positive integer.	7 Marks	L3	CO1	PO3
		(OR)				
4.	a)	Define algorithm. Design an algorithm to check whether a number given by the user is odd or even.	7 Marks	L2	CO2	PO3
	b)	Explain the top-down design technique for solving the given problem.	7 Marks	L2	CO2	PO5
		UNIT-III				
5.	a)	Write a C program to find the second largest number in a list of integers.	7 Marks	L2	CO3	PO3
	b)	Write a C program to generate the prime numbers between 1 and *N*. Define a separate function to generate prime numbers.	7 Marks	L3	CO3	PO3
		(OR)				
6.	a)	Compare and contrast automatic, external and static variables.	7 Marks	L2	CO3	PO2
	b)	Write a C program to insert a sub-string in to a main string at a given position.	7 Marks	L3	CO3	PO3
		UNIT-IV				
7.	a)	Write a C program using pointers to read in an array of integers and print its elements in reverse order.	7 Marks	L2	CO3	PO1
	b)	Compare static and dynamic memory allocation. Describe dynamic memory allocation functions.	7 Marks	L3	CO3	PO2
		(OR)				
8.	a)	Differentiate call-by-value and call-by-address with a suitable C program.	7 Marks	L2	CO4	PO2
	b)	Write a C program to count the number of vowels and consonants in a string using pointers.	7 Marks	L3	CO4	PO3

UNIT-V

9.	a)	Define structure. Show the procedure to access structure members with a suitable example.	7 Marks	L2	CO5	PO1
	b)	Write a C program that demonstrates the creation of nodes using a self-referential structure.	7 Marks	L3	CO5	PO3
		(OR)				
10.	a)	Write a C program that demonstrates passing a structure to a function.	7 Marks	L2	CO5	PO3
	b)	Explain the following: i) Union. ii) Enumeration types.	7 Marks	L2	CO5	PO1

CODE No.: 20BT12901 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Supplementary Examinations September – 2021

DISCRETE MATHEMATICAL STRUCTURES

[Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Find the Conjunctive normal form of $\sim(PVQ) \leftrightarrow (P \vee Q)$.	7 Marks	L3	CO1	PO3
	b)	Is $[(P \rightarrow R) \wedge (Q \rightarrow R)] \rightarrow [(P \vee Q) \rightarrow R]$ a Tautology or not? Justify	7 Marks	L4	CO1	PO2
		(OR)				
2.	a)	What is the first order predicate calculus statement equivalent to the following premise? "Every teacher is liked by the student".	7 Marks	L2	CO1	PO1
	b)	Given the truth value of P and Q as T and those of R and S as F. Find the Truth value for the following statements. i) $(P \rightleftarrows R) \wedge (\sim Q \rightarrow S)$. ii) $(P \vee (Q \rightarrow (R \wedge \sim P))) \rightleftarrows (Q \vee \sim S)$.	7 Marks	L3	CO1	PO3
		UNIT-II				
3.	a)	Give an example for symmetric, antisymmetric, compatibility and transitive relations.	7 Marks	L3	CO2	PO2
	b)	Determine the value of fog, gof, f^{-1}og and $g^{-1}$of^{-1} for the functions f and g defined by $f(x) = x^2-2$, $g(x) = x + 4$ where R → R (set of real numbers).	7 Marks	L3	CO2	PO7
		(OR)				
4.	a)	Show that the "greater than or equal "relation is a partial ordering on set of integers.	7 Marks	L4	CO2	PO2
	b)	Draw the Hasse diagram of the set {2, 4, 8, 16} under the partial ordering relation "divides" and indicate those which are totally ordered.	7 Marks	L3	CO2	PO3
		UNIT-III				
5.	a)	Show that the set of Natural numbers is a semi group under the operation x*y = max{x, y} and also calculate is it Monoid.	7 Marks	L3	CO3	PO1
	b)	Let H = {0, 2, 4}. Check that (H, +6) is a subgroup of $(z_6, +6)$.	7 Marks	L3	CO3	PO2
		(OR)				
6.	a)	Discuss that monoid homomorphism preserves the property of invertibility with an example.	7 Marks	L2	CO3	PO1
	b)	Examine the relation a * b = a + b - ab for all a, b Є G is a group or not.	7 Marks	L4	CO3	PO2
		UNIT-IV				
7.	a)	Find the coefficient of x^{23} and x^{32} for the function $(1 + x^5 + x^9)^{10}$.	7 Marks	L3	CO4	PO3
	b)	How many ways can 5 day's be chosen from each of the 12 months of an ordinary year of 365 day's.	7 Marks	L3	CO4	PO4
		(OR)				

8.	a)	Solve the Recurrence Relation $a_n - 9a_{n-1} - 26a_{n-2} - 24a_{n-3} = 0$ where $a_0 = 0$, $a_1 = 1$ and $a_2 = 10$.	7 Marks	L2	CO4	PO4
	b)	Compute the number of six letter combinations of the letter of English alphabet. If no letter is to appear in the combination more than 2 times.	7 Marks	L3	CO4	PO2

UNIT-V

9.	a)	Define the following with examples: i) Graph. ii) Degree of a vertex. iii) Complete Graph. iv) Sub Graph.	8 Marks	L2	CO5	PO1
	b)	Write a short note on: i) Euler circuit. ii) Hamiltonian circuit.	6 Marks	L2	CO5	PO4

(OR)

10.	a)	Show that a tree with **n** vertices has exactly (n-1) edges.	7 Marks	L4	CO5	PO2
	b)	Show that the K_7 has Hamiltonian graph. How many edge disjoint Hamiltonian cycles are there in K_7?	7 Marks	L4	CO5	PO2

CODE No.: 20BT12902 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Supplementary Examinations September – 2021

FUNDAMENTALS OF BUSINESS INFORMATION SYSTEMS

[Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Describe business environment of an organization with a neat diagram.	9 Marks	L2	CO1	PO1
	b)	Compare explicit knowledge, tacit knowledge and wisdom in Business information systems.	5 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Discuss about the characteristics of generic systems.	7 Marks	L2	CO1	PO1
	b)	Distinguish between deterministic, probabilistic and adaptive systems.	7 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	Briefly explain the secondary storage devices.	7 Marks	L2	CO2	PO1
	b)	Explain the advantages of virtual computing.	7 Marks	L2	CO2	PO2
		(OR)				
4.	a)	Describe the tools and technologies of Rich Internet Applications.	7 Marks	L4	CO2	PO3
	b)	Explain the mechanism followed by affiliate marketing.	7 Marks	L4	CO2	PO3
		UNIT-III				
5.	a)	Describe the Business-level advantages of databases.	7 Marks	L2	CO3	PO1
	b)	Compare and contrast scorecards and dashboards.	7 Marks	L4	CO3	PO2
		(OR)				
6.	a)	Discuss about data mining techniques to extract useful information from large databases.	7 Marks	L2	CO3	PO1
	b)	Explain the ETL process within a data warehouse.	7 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	Explain, with the aid of diagrams, differentiate between the following network topologies: i) star. ii) bus. iii) ring.	7 Marks	L2	CO4	PO2
	b)	Discuss the merits and demerits of locating company e-business services inside a company, in comparison with outsourcing to an ISP or ASP.	7 Marks	L2	CO4	PO1
		(OR)				
8.	a)	Explain the client/sever model of computing with neat diagram.	7 Marks	L2	CO4	PO1
	b)	Compare and contrast business and consumer models of internet access.	7 Marks	L4	CO4	PO1
		UNIT-V				
9.	a)	Discuss the advantages of Enterprise system approach.	7 Marks	L2	CO6	PO1
	b)	Describe the usage of supplier management systems in an organisation.	7 Marks	L2	CO5	PO2
		(OR)				
10.	a)	Explain the key elements of transaction processing systems.	7 Marks	L2	CO5	PO2
	b)	Discuss the different types of vertical integration in supply chain design.	7 Marks	L2	CO6	PO1

CODE No.: 20BT1BS02 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-20) Regular Examinations September – 2021

ENGINEERING CHEMISTRY

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Science)]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Describe the principle and process of determination of hardness of a water sample by EDTA method.	7 Marks	L2	CO1	PO1
	b)	Define defluoridation. "*Presence of fluoride in drinking water causes several health issues*" – Support the statement with necessary explanation.	7 Marks	L3	CO1	PO6
		(OR)				
2.	a)	Discuss ion exchange process of softening of water with a neat diagram.	7 Marks	L2	CO1	PO2
	b)	Explain the reasons for formation of scales in boilers. Mention any three disadvantages of scales.	7 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Write Schrodinger wave equation and explain the terms involved in it. Describe briefly the significance of Ψ and Ψ^2.	7 Marks	L1	CO2	PO1
	b)	List the salient features of molecular orbital theory.	7 Marks	L1	CO2	PO2
		(OR)				
4.	a)	Explain about quantum-mechanical model of atom.	7 Marks	L2	CO2	PO1
	b)	Draw the energy level diagram of any hetero nuclear diatomic molecule and calculate its bond order.	7 Marks	L2	CO2	PO2
		UNIT-III				
5.	a)	Define electrode potential. Write Nernst equation and explain the terms involved in it.	7 Marks	L1	CO3	PO1
	b)	Compare sacrificial anodic protection and impressed current cathodic protection applied for corrosion control.	7 Marks	L4	CO3	PO6
		(OR)				
6.	a)	Explain construction and working of any lithium ion battery.	7 Marks	L2	CO3	PO1
	b)	Differentiate between dry corrosion and wet corrosion with an example each.	7 Marks	L4	CO3	PO2
		UNIT-IV				
7.	a)	Differentiate between chromophore and auxochrome with an example each. Define and explain the terms 'bathochromic shift' and 'hypsochromic shift'.	7 Marks	L4	CO4	PO1
	b)	Make use of a neat diagram to explain instrumentation of IR spectrophotometer.	7 Marks	L3	CO4	PO5
		(OR)				
8.	a)	Discuss the two types of electronic transitions involving π-orbitals in UV-visible spectroscopy.	7 Marks	L2	CO4	PO1
	b)	Describe any three applications of IR spectroscopy.	7 Marks	L2	CO4	PO5

UNIT-V

9.	a)	Explain different types of fuels with suitable examples.	7 Marks	L2	CO5	PO1
	b)	List the functions of lubricants and discuss mechanism of lubrication.	7 Marks	L1	CO5	PO2
		(OR)				
10.	a)	Discuss the concept of knocking and role of anti-knocking agents in its control.	7 Marks	L2	CO5	PO6
	b)	Distinguish the following pairs of properties of lubricants: i) Flash points and Fire point ii) Cloud point and Pour point	7 Marks	L4	CO5	PO1

CODE No.: 20BT1BS03 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-20) Regular Examinations September – 2021

ENGINEERING PHYSICS

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering, Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Derive an expression for condition of maxima and minima for reflected light in case of thin transparent film of uniform thickness.	10 Marks	L1	CO1	PO2
	b)	List out the conditions for obtaining the interference pattern.	4 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Describe the construction and working of a Nicol Prism	10 Marks	L2	CO1	PO2
	b)	Plane polarized light passes through a double refracting crystal of thickness 40μm and emerges out as circularly polarized light .If the birefringence of crystal is 0.00004, find the wavelength of the incident light.	4 Marks	L3	CO1	PO1
		UNIT-II				
3.	a)	Identify four Maxwell's field equations along with their physical significance.	8 Marks	L3	CO2	PO2
	b)	Outline the divergence and curl of electric and magnetic fields.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Using a block diagram, explain the optical fiber communication system.	10 Marks	L2	CO2	PO2
	b)	Outline the various applications of optical fibers.	4 Marks	L2	CO2	PO1
		UNIT-III				
5.	a)	Differentiate direct and indirect band semiconductors.	4 Marks	L2	CO3	PO2
	b)	Derive an expression for concentration of holes in intrinsic semiconductors.	10 Marks	L3	CO3	PO1
		(OR)				
6.	a)	Explain construction and working of semiconductor diode laser.	8 Marks	L2	CO3	PO2
	b)	Describe the formation of pn-junction.	6 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	Develop the theory and expression for Lorenz field experienced by an atom in a dielectric material.	10 Marks	L3	CO4	PO2
	b)	Describe the dielectric breakdown and the piezoelectric effect.	4 Marks	L2	CO4	PO1
		(OR)				
8.	a)	Extend the theory of hysteresis of fero - magnetic materials.	7 Marks	L2	CO4	PO1
	b)	Distinguish between soft and hard magnetic materials.	7 Marks	L4	CO4	PO1
		UNIT-V				
9.	a)	Explain critical parameters of superconductors and Josephson effect.	8 Marks	L2	CO5	PO2
	b)	Discuss the BCS theory of superconductors.	6 Marks	L2	CO5	PO1
		(OR)				
10.	a)	Discuss the properties of Nano materials.	8 Marks	L2	CO5	PO1
	b)	Explain the synthesis of Nano material by PLD method.	6 Marks	L2	CO5	PO2

CODE No.: 20BT1BS04 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-20) Regular Examinations September – 2021

APPLIED PHYSICS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Summarize the classification of an optical fibre based on refractive index profile and modes of propagation with neat sketches.	10 Marks	L2	CO1	PO1
	b)	List any four applications of optical fibres.	4 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Explain the principle of operation of optical fiber. Draw a schematic layout of a step index optical fiber.	9 Marks	L2	CO1	PO1
	b)	A step index fiber has a core of refractive index 1.5. If the numerical aperture of the fiber is 0.26, calculate the refractive index of the cladding material.	5 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Derive Sabine's formula for reverberation time. Write its drawbacks.	9 Marks	L2	CO2	PO1 PO2
	b)	The reverberation time is found to be 2.4 sec for an empty hall, and it is found to be 1.9 sec when a curtain cloth of 25m^2 is suspended at the center of the hall. If the dimensions of the hall are 15 x 10 x 6m, calculate the coefficient of absorption of curtain cloth.	5 Marks	L3	CO2	PO2
		(OR)				
4.	a)	Explain the principle, construction and working of production of ultrasonic waves using piezoelectric method.	10 Marks	L2	CO2	PO1
	b)	A X-cut piezoelectric crystal plane has a thickness of 1.6mm. The velocity of propagation of sound waves along the x-direction is 5760m/sec. Calculate the fundamental frequency of the crystal.	4 Marks	L3	CO2	PO2

UNIT-III

5.	a)	If a body is thrown horizontally into space, find the path traced by that body mathematically.	7 Marks	L2	CO3	PO2
	b)	Sketch the displacement ***Vs*** time curve, velocity ***Vs*** time curve and acceleration ***Vs*** time curve of a body travelling in a straight-line path and give your inferences.	7 Marks	L3	CO3	PO2
		(OR)				
6.	a)	Assume that a wheel is acted upon by torque, derive an expression for moment the wheel undergoes, if the body rotates about its own axis with an acceleration "α".	7 Marks	L1	CO3	PO1
	b)	Derive an expression for work energy equation for a body of weight W undergoing a translation motion.	7 Marks	L2	CO3	PO1 PO2

UNIT-IV

7.	a)	Explain in detail a technique to find the thermal conductivity of bad conductor.	8 Marks	L2	CO4	PO1
	b)	Explain in detail different modes of heat transfer.	6 Marks	L2	CO4	PO1 PO2

(OR)

8.		Derive an expression for heat conducted through compound media when the materials are connected in series.	14 Marks	L2	CO4	PO1

UNIT-V

9.	a)	Explain the preparation of metallic glass by RF sputtering technique. Write its advantage over other techniques.	10 Marks	L2	CO5	PO1
	b)	Describe any two applications of metallic glasses.	4 Marks	L2	CO5	PO1 PO2

(OR)

10.	a)	Define shape memory effect. Briefly explain the main features of shape memory alloys.	9 Marks	L2	CO5	PO1
	b)	List the properties of NiTi alloy.	5 Marks	L3	CO5	PO1 PO2

CODE No.: 20BT1HS01 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-20) Regular Examinations September – 2021

COMMUNICATIVE ENGLISH

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		What are the language skills involved in Technical communication? Explain in detail.	14 Marks	L1	CO2	PO2
		(OR)				
2.	a)	Discuss in detail the differences between Interpersonal communication and Intrapersonal communication.	7 Marks	L6	CO2	PO1
	b)	Identify the differences between 'postures' and 'gestures' in Nonverbal communication.	7 Marks	L3	CO4	PO5
		UNIT-II				
3.		Illustrate the traits of a good listener.	14 Marks	L2	CO2	PO2
		(OR)				
4.	a)	'Sometimes, it is necessary to be a Passive listener.' Justify the statement.	7 Marks	L5	CO2	PO1
	b)	What signals can you identify among listeners during the stage of Empathetic listening?	7 Marks	L1	CO2	PO2
		UNIT-III				
5.		Explain 'Paralinguistic features' in detail.	14 Marks	L2	CO1	PO1
		(OR)				
6.	a)	Discuss the role of 'Confidence' in one's communication and presentation.	7 Marks	L6	CO4	PO10
	b)	'Awareness of Intercultural differences plays a significant role in communication.' Develop the statement meaningfully.	7 Marks	L3	CO4	PO10
		UNIT-IV				
7.		Explain the techniques followed for good comprehension of a text.	14 Marks	L2	CO3	PO5
		(OR)				
8.	a)	What role does Topic sentence play in a text?	7 Marks	L1	CO3	PO5
	b)	Why do you think SQ3R Reading technique is a widely used reading technique? Discuss.	7 Marks	L1	CO3	PO5
		UNIT-V				
9.		Classify the types of Essays and explain them in detail.	14 Marks	L4	CO1	PO1
		(OR)				
10.	a)	What are the Characteristic features of an Essay? Explain.	7 Marks	L1	CO1	PO1
	b)	Identify the steps to elaborate to produce an effective Precis writing.	7 Marks	L3	CO3	PO5

CODE No.: 20BT2BS01 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-20) Regular Examinations September – 2021

TRANSFORMATION TECHNIQUES AND LINEAR ALGEBRA

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Science), Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define an even function and give an example. Obtain Fourier series for the function $f(x) = x^2$ in $(-\pi, \pi)$.	7 Marks	L3	CO1	PO1
	b)	Express $f(x) = \begin{cases} 1, & 0 < x < \pi \\ 0, & > \pi \end{cases}$ as a Fourier sine integral and hence, evaluate $\int_0^\infty \frac{1-\cos\pi\lambda}{\lambda} \sin x\lambda \, d\lambda$.	7 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Find the half-range sine series of $f(x) = \begin{cases} kx, & 0 < x < \frac{\pi}{2} \\ k(\pi - x), & \frac{\pi}{2} < x < \pi \end{cases}$ *in* $0 < x < \pi$.	7 Marks	L1	CO1	PO1
	b)	Find the Fourier sine transform of $f(x) = \frac{e^{-ax}}{x}$ and deduce that $\int_0^\infty \frac{e^{-ax} - e^{-bx}}{x} \sin sx \, dx = \tan^{-1}\left(\frac{s}{a}\right) - \tan^{-1}\left(\frac{s}{b}\right)$.	7 Marks	L1	CO1	PO1

UNIT-II

3.	a)	Using Laplace transform, evaluate $\int_0^\infty \frac{e^{-2t}\sin^2 t}{t} dt$.	7 Marks	L3	CO2	PO2
	b)	Find the Laplace transform of the triangular wave of period 2a given by $f(t) = \begin{cases} t & 0 < t < a \\ 2a - t, & a < t < 2a \end{cases}$.	7 Marks	L1	CO2	PO1
		(OR)				
4.	a)	Find the Laplace transform of $f(t) = t^2 e^{-2t} \cos t$.	7 Marks	L1	CO2	PO1
	b)	Define unit step function and find its Laplace transform. Find Laplace transform of $f(t) = e^{-2t}\{1 - u(t-1)\}$.	7 Marks	L1	CO2	PO1

UNIT-III

5.	a)	Apply convolution theorem, find the inverse Laplace transform of the function $\frac{s^2}{(s^2+a^2)(s^2+b^2)}$, $a \neq b$.	7 Marks	L5	CO2	PO2
	b)	Find $L^{-1}\left\{\frac{e^{-2s}}{s^2+4s+5}\right\}$.	7 Marks	L1	CO2	PO1
		(OR)				
6.		Solve the differential equation $\frac{d^2x}{dt^2} + 9x = \sin t$, using Laplace transform, given that x(0) = 1, x(π/2) = 1.	14 Marks	L3	CO2	PO2

UNIT-IV

7.	a)	Find the rank of the matrix $A = \begin{bmatrix} 1 & 2 & 3 & 0 \\ 2 & 4 & 3 & 2 \\ 3 & 2 & 1 & 3 \\ 6 & 8 & 7 & 5 \end{bmatrix}$ by reducing it to echelon form.	7 Marks	L1	CO3	PO2
	b)	Are the systems of equations consistence? If so, solve them. **x + y + 2z + w = 5; 2x + 3y – z – 2w = 2; 4x + 5y + 3z = 7**.	7 Marks	L3	CO3	PO2
		(OR)				
8.		Is the matrix $A = \begin{bmatrix} 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{bmatrix}$ diagonalizable? If so, find the model matrix and diagonal matrix.	14 Marks	L3	CO3	PO2

UNIT-V

9.	a)	Determine whether or not the vectors (1, -2, 6), (3, 2, 7), (2, 4, 1) in R^3 are linearly dependent. If so find the relationship between them.	7 Marks	L4	CO4	PO2
	b)	Find the rank and nullity of the linear transformation T : $R^2 \rightarrow R^3$ defined by $T\left(\begin{bmatrix} a \\ b \end{bmatrix}\right) = \begin{bmatrix} a-b \\ a+b \\ b \end{bmatrix}$.	7 Marks	L1	CO4	PO1
		(OR)				
10.	a)	Show that the set B = **{1 + x, x + x^2, 1 + x^2}** is a basis for the vector space P_2 of all polynomials of degree at most 2 over R.	7 Marks	L2	CO4	PO1
	b)	Determine matrix of the linear transformation T : $P_2 \rightarrow P_2$ defined by T(p(x)) = p(x + 2) with respect to the basis B = {1, x, x^2}, here P_2 is the vector space of all polynomials of degree at most 2.	7 Marks	L3	CO4	PO2

❀ ❀ ❀

CODE No.: 20BT10201 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-20) Regular Examinations September – 2021

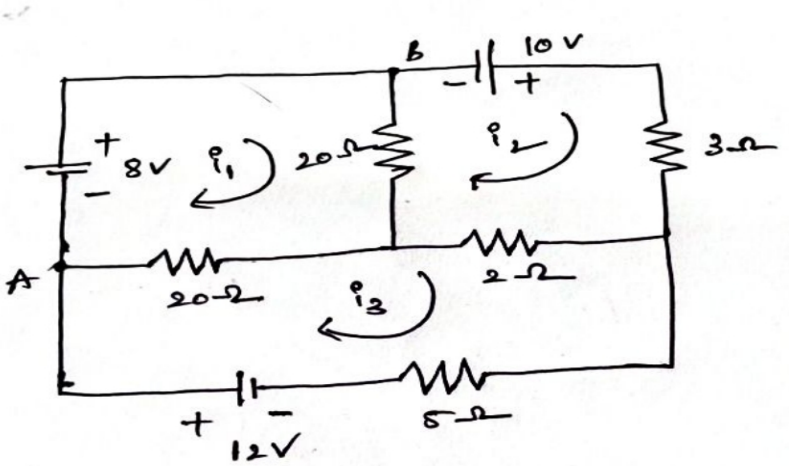
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

[Civil Engineering, Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Find the current in 5ohm resistor from the circuit diagram given below: 	8 Marks	L3	CO1	PO2
	b)	Discuss briefly about the phasor representation of a sinusoidal waveform.	6 Marks	L2	CO1	PO1

(OR)

2.	a)	Illustrate Kirchoff's Voltage and Kirchoff's Current laws with the help of an example each.	8 Marks	L2	CO2	PO2
	b)	Define the following terms: i) Power factor. ii) Reactive power. iii) Apparent power.	6 Marks	L2	CO2	PO2

UNIT-II

3.	a)	Illustrate the working details of Hydro power plants with neat diagrammatic representation.	10 Marks	L2	CO2	PO2
	b)	Discuss about power factor correction and its importance in electrical system.	4 Marks	L2	CO2	PO2

(OR)

4.	a)	Explain the sustainable power generation process in thermal power plant with a neat diagram.	8 Marks	L2	CO2	PO7
	b)	Write short notes on: i) BEE standards. ii) ELCB. iii) Relay.	6 Marks	L2	CO2	PO2

UNIT-III

5.	a)	Explain in detail about working of a single phase transformer.	6 Marks	L3	CO4	PO2
	b)	Differentiate resistor start and capacitor start single phase induction motor.	8 Marks	L2	CO4	PO2

(OR)

6.	a)	Illustrate the construction and working principle of a 3-phase induction motor with a neat sketch.	10 Marks	L2	CO4	PO2
	b)	What is the significance of EMF equation of a single phase transformer?	4 Marks	L2	CO4	PO2

UNIT-IV

7.	a)	Explain the input and output characteristics of CE configuration.	10 Marks	L2	CO4	PO2
	b)	Define the following terms: i) Ripple factor. ii) Peak Inverse Voltage.	4 Marks	L2	CO4	PO2

(OR)

8.	a)	Explain the working principle of a Zener diode in forward and reverse bias conditions and draw its V-I characteristics.	8 Marks	L2	CO2	PO1
	b)	Compare CE, CB and CC configurations of a transistor.	6 Marks	L2	CO2	PO2

UNIT-V

9.	a)	Define an Op-Amp. Illustrate the equivalent circuit of an Op-Amp with a neat sketch.	7 Marks	L2	CO2	PO2
	b)	Illustrate the differentiator circuit with a neat diagram and derive the output voltage.	7 Marks	L2	CO2	PO1

(OR)

10.	a)	Write short notes on: i) Operational Amplifier. ii) Comparator circuit.	8 Marks	L2	CO2	PO2
	b)	Illustrate various applications of an Op-Amp.	6 Marks	L2	CO2	PO2

CODE No.: 20BT20101 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-20) Regular Examinations September – 2021

CIVIL ENGINEERING MATERIALS AND CONCRETE TECHNOLOGY

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the various factors that cause deterioration of stone work and the preservation of stones.	8 Marks	L4	CO1	PO1
	b)	Explain any two laboratory tests on bricks.	6 Marks	L4	CO1	PO1 PO2 PO4 PO5 PO6 PO7 PO8 PO10
		(OR)				
2.	a)	Explain dressing of stones and what are the requirements of good building stones.	7 Marks	L3	CO1	PO1 PO5 PO6 PO7
	b)	List out the types of tiles.	7 Marks	L4	CO1	PO1 PO8

UNIT-II

3.	a)	Explain the qualities of a good timber.	7 Marks	L4	CO2	PO1 PO5 PO6 PO7 PO8
	b)	Give a brief description of the process of painting on different surfaces.	7 Marks	L4	CO2	PO1 PO2 PO7 PO12
		(OR)				
4.	a)	What are the materials used for construction.	7 Marks	L4	CO2	PO1
	b)	How do you select the materials and sizes of forms for construction work?	7 Marks	L4	CO2	PO1

UNIT-III

5.	a)	Explain about soundness test for Portland cement by using Le-chateliers apparatus as per IS: 4031(part 3)-1988.	7 Marks	L4	CO3	PO1 PO5 PO8
	b)	What are the properties of good aggregates for making concrete and discuss in brief various tests carried out on aggregates.	7 Marks	L4	CO3	PO1 PO5 PO8
		(OR)				

6.	a)	Explain how do you determine moisture content of aggregate.	7 Marks	L4	CO3	PO1 PO2
	b)	Write about sieve analysis.	7 Marks	L4	CO3	PO1 PO2
		UNIT-IV				
7.	a)	What is segregation and bleeding of concrete why they occur, discuss how to prevent them.	7 Marks	L4	CO4	PO1 PO5 PO8
	b)	Write short notes on Ultrasonic pulse velocity test.	7 Marks	L4	CO4	PO1 PO5 PO8
		(OR)				
8.	a)	Discuss about the maturity concept of concrete. The strength of sample of fully matured concrete is found to be 40Mpa. Find the strength of identical concrete at the age of 7 days when cured at an average temperature during day time at 20^0C and night time at 10^0C.	7 Marks	L4	CO4	PO1
	b)	Explain about factors affecting the compressive strength of concrete.	7 Marks	L4	CO4	PO1 PO7
		UNIT-V				
9.	a)	What is shrinkage of concrete? Explain the various factors affecting shrinkage of concrete.	7 Marks	L4	CO5	PO1 PO7
	b)	How does strength of concrete influence the modulus of elasticity and Poisson's ratio of concrete?	7 Marks	L4	CO5	PO1 PO2
		(OR)				
10.		Explain in detail the various steps involved in designing concrete mixes using IS 10262 method.	14 Marks	L4	CO6	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8

CODE No.: 20BT20201 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-20) Regular Examinations September – 2021

ELECTRICAL CIRCUITS

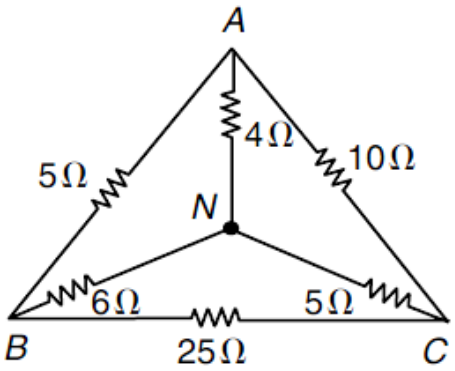
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

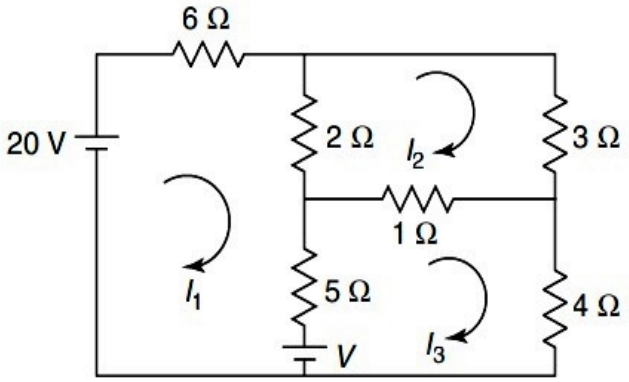
UNIT-I

1.	a)	Derive the expressions for equivalent resistance in case of star to delta transformation.	7 Marks	L2	CO1	PO1
	b)	Find the equivalent resistance between A and N of the circuit below.	7 Marks	L3	CO1	PO2

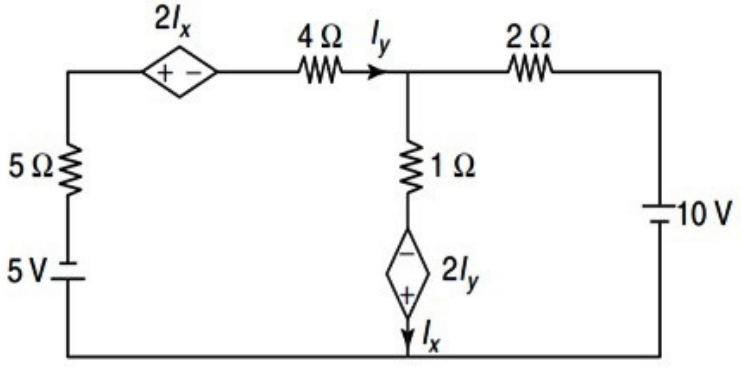


(OR)

2.	a)	Determine the voltage V which causes the current I_1 to be zero in the network shown in Fig.	7 Marks	L3	CO1	PO4

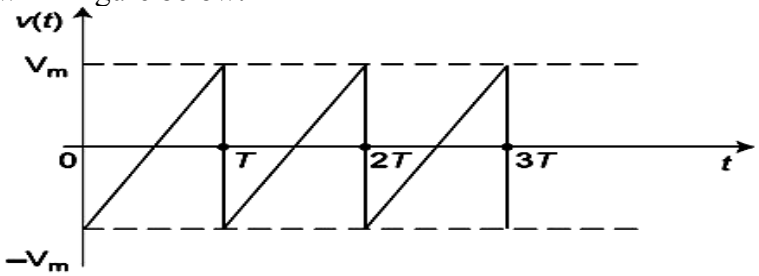


	b)	Find currents I_X and I_Y of the network shown in the Fig.	7 Marks	L3	CO1	PO4



UNIT-II

3.	a)	Determine the average and r.m.s values of a sinusoidal current having I_m as the maximum value. Hence, find the values of the peak factor and form factor.	7 Marks	L2	CO2	PO2
	b)	Determine the form factor and peak factor of the waveform shown in figure below.	7 Marks	L3	CO2	PO2

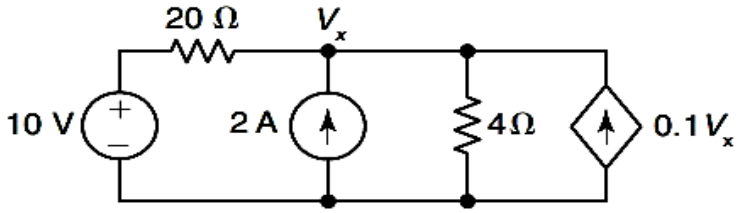


(OR)

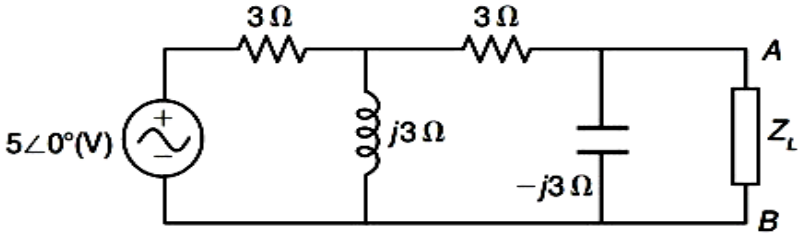
4.	a)	In a particular RL series circuit, a voltage of 10V at 50Hz produces a current of 700mA while the same voltageat 75Hz produces a current of 500mA. Design the values of R and L in the circuit?	7 Marks	L6	CO2	PO3
	b)	A series RLC circuit consists of a resistance of 1kΩ, an inductance of 10mH and a capacitance of 100μF. For a supply voltage of 100 V, determine the following: i) Resonant frequency. ii) Q-Factor of the circuit. iii) Half-power frequencies.	7 Marks	L3	CO2	PO2

UNIT-III

5.	a)	Use the superposition theorem and determine the value of voltageV_x in the given circuit.	7 Marks	L3	CO3	PO5

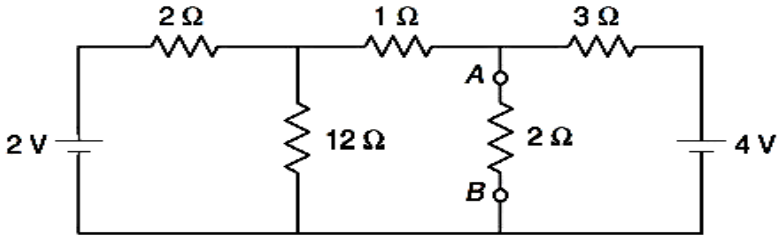


	b)	In the network shown, find the value of Z_L to which the maximum power can be delivered. Hence, find the value of the maximum power.	7 Marks	L3	CO3	PO5

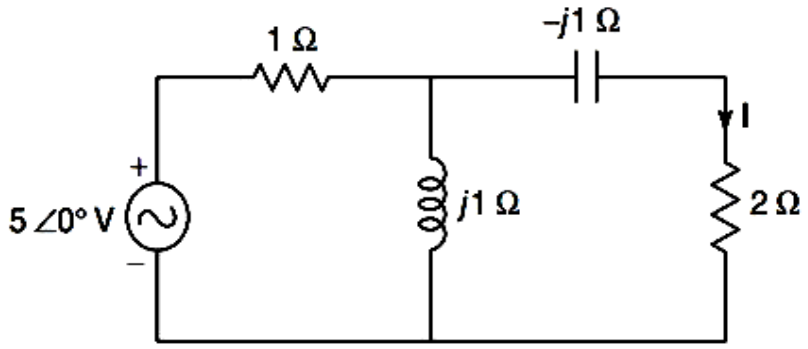


(OR)

6.	a)	Obtain the Thevenin's equivalent circuit and find the current through 2Ω resistor connected between terminals A and B in the given circuit.	7 Marks	L3	CO3	PO5



	b)	Find the current through the 6Ω resistor and verify the reciprocity theorem.	7 Marks	L3	CO3	PO5



UNIT-IV

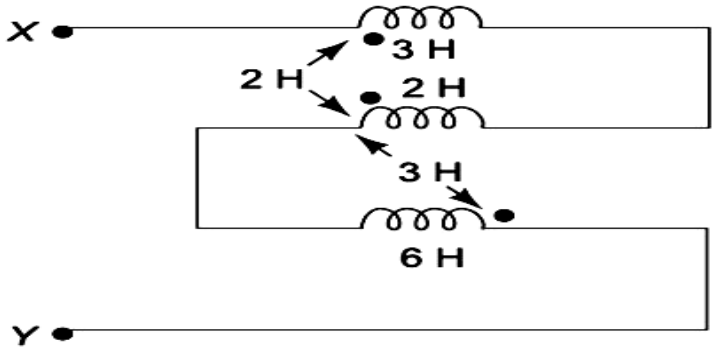
7.	a)	Show that power consumption, when three identical impedances are connected in delta across a balanced 3-phase supply, is three times that when the same impedances are connected in star across the same 3-phase supply.	7 Marks	L5	CO4	PO4
	b)	A balanced 3-phase, star-connected load of 100kW takes a leading current of 80A, when connected across a 3-phase 1100-V, 50-Hz supply. Find the circuit constants of the load per phase.	7 Marks	L4	CO4	PO3

(OR)

8.	a)	Explain the measurement of 3-phase active and reactive powers using two watt meter method with a neat phasor diagram.	7 Marks	L2	CO4	PO2
	b)	Three coils each with a resistance of 10Ω and reactance of 10Ω are connected in star across a 3-phase, 50Hz, 400V supply. Calculate: i) line current, and ii) readings on the two watt meters connected to measure the power.	7 Marks	L3	CO4	PO2

UNIT-V

9.	a)	Determine the equivalent inductance of two coils with self-inductances L_1, L_2 and mutual inductance M are connected in parallel aiding and parallel opposing.	7 Marks	L2	CO5	PO2
	b)	Find the equivalent inductance between the terminals across XY for the coupled circuit shown.	7 Marks	L4	CO5	PO2



(OR)

10.	a)	Explain the dot convention used in magnetically coupled circuits with the help of suitable examples.	7 Marks	L2	CO5	PO1
	b)	Two inductors are connected in parallel. Their equivalent inductance when the mutual inductance aids the self-inductance is 6mH and it is 2mH when the mutual inductance opposes the self-inductance. If the ratio of the self-inductances is 1:3 and the mutual inductance between the coils is 4mH, find the self-inductances.	7 Marks	L3	CO5	PO3

❀ ❀ ❀

CODE No.: 20BT20241 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-20) Regular Examinations September – 2021

NETWORK ANALYSIS

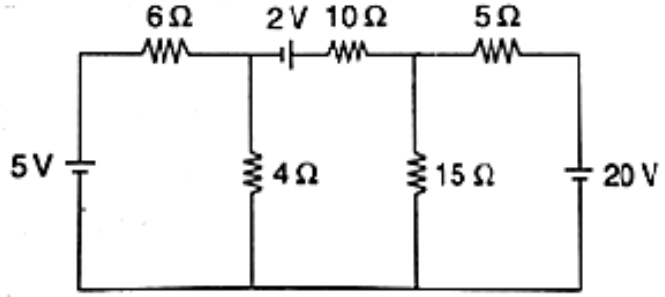
[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

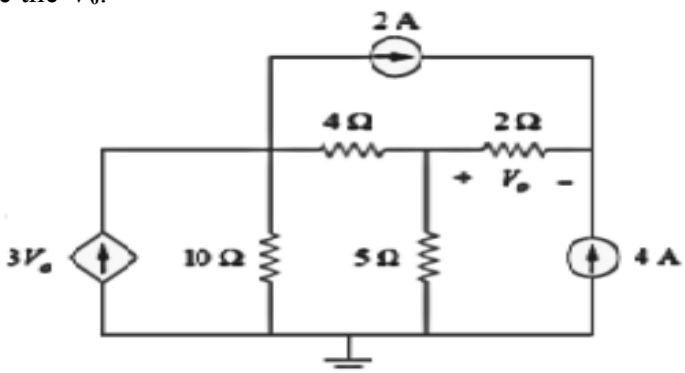
UNIT-I

1.	a)	State and explain KVL and KCL with examples.	7 Marks	L2	CO1	PO2
	b)	Determine the current through 10Ω resistor in the fig below using mesh analysis.	7 Marks	L4	CO1	PO2

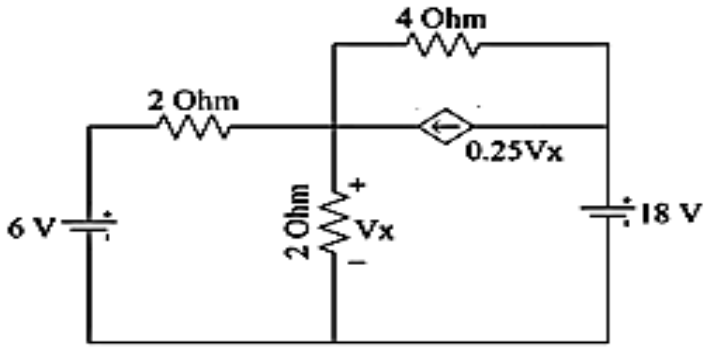


(OR)

2.	a)	Obtain the Node equation for the circuit shown below and compute the V_0.	7 Marks	L3	CO1	PO2



	b)	Find Vx for the circuit shown below.	7 Marks	L4	CO1	PO2



UNIT-II

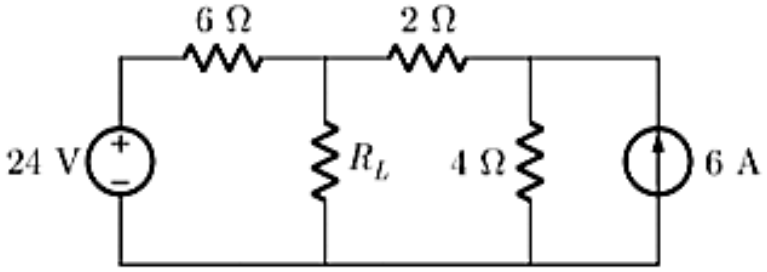
3.	a)	Derive expression for bandwidth of series resonance circuit.	7 Marks	L2	CO1	PO2
	b)	In a series RLC circuit with R = 10 Ω, L = 0.1 H and C = 50 μF, find resonant frequency, quality factor and band width.	7 Marks	L3	CO2	PO2

(OR)

4.	a)	A series connected load draws a current I(t) = 4sin (100πt)A when the applied voltage is V(t) = 120 sin (100πt)V. Find the power factor.	7 Marks	L4	CO1	PO2
	b)	Design a series RLC circuit that resonates at 1.5kHz and consumes 50W from a 50V A.C source operating at the resonance frequency. The bandwidth is 0.75kHz.	7 Marks	L3	CO2	PO2

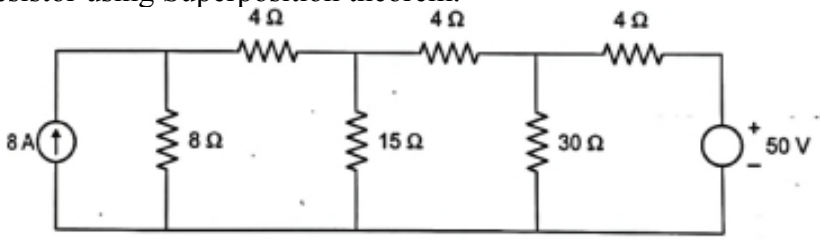
UNIT-III

5.	a)	State and explain Thevinin's theorem.	7 Marks	L2	CO1	PO2
	b)	Determine the value of RL and also calculate Pmax by using maximum power transfer theorem.	7 Marks	L4	CO1	PO5



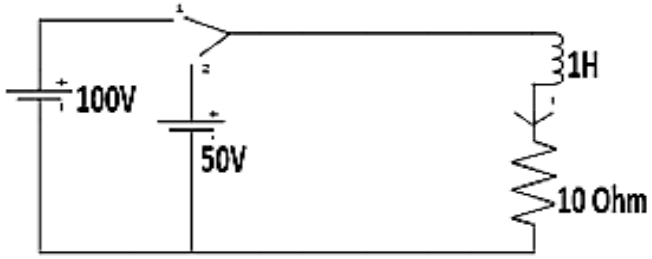
(OR)

6.	a)	State and explain reciprocity theorem.	7 Marks	L3	CO1	PO2
	b)	For the circuit shown in figure find the current through the 15Ω resistor using Superposition theorem.	7 Marks	L4	CO1	PO2



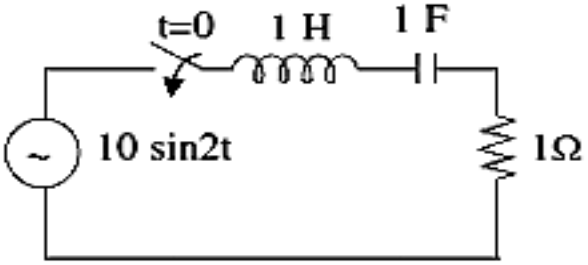
UNIT-IV

7.	a)	Find the transient response of RL series circuit for dc excitation.	7 Marks	L3	CO1	PO2
	b)	The switch is in position 1 for long time and moved to position 2 at t= 0, find current i.	7 Marks	L4	CO1	PO2

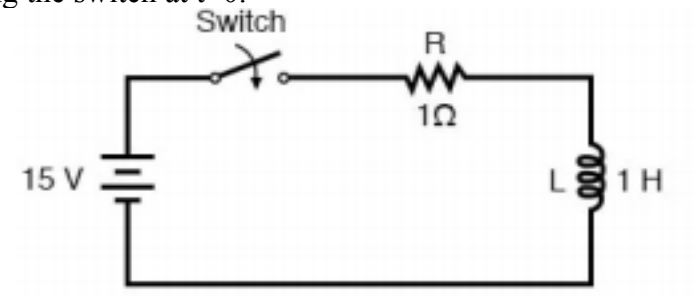


(OR)

8.	a)	Find the current in the circuit shown for t > 0. At t = 0 sec. the network was unenergized.	7 Marks	L3	CO2	PO6

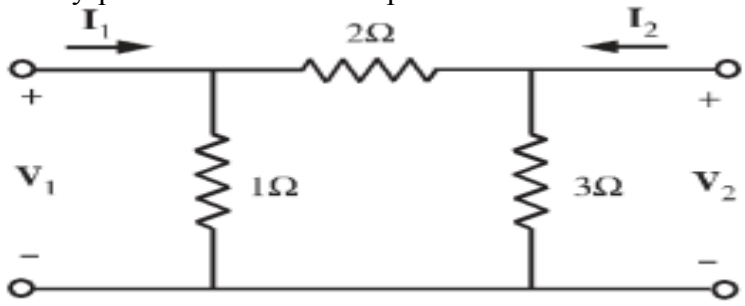


	b)	For the circuit shown below find the current in the circuit after closing the switch at t=0.	7 Marks	L4	CO1	PO2



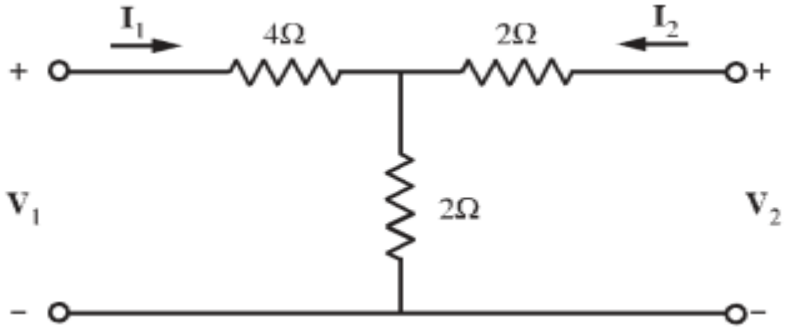
UNIT-V

9.	a)	Express h parameters in terms of ABCD parameters for a generalized network.	7 Marks	L2	CO5	PO1
	b)	Find the y-parameters of the two-port network shown below.	7 Marks	L4	CO2	PO5



(OR)

10.	a)	Prove that reciprocity and symmetry condition for Z-parameters.	7 Marks	L2	CO1	PO2
	b)	Find the ABCD parameters of the two-port network shown below.	7 Marks	L4	CO1	PO2



❀ ❀ ❀

CODE No.: 20BT20301 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-20) Regular Examinations September – 2021

BASIC ENGINEERING MECHANICS

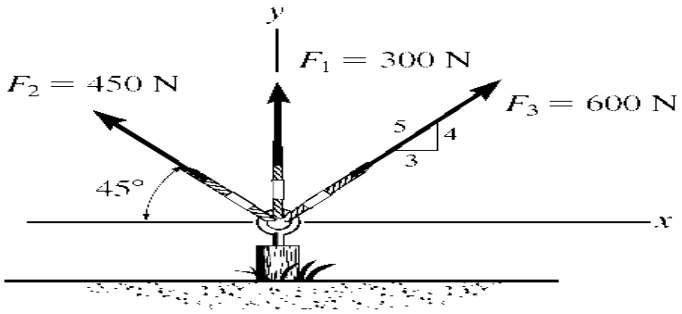
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

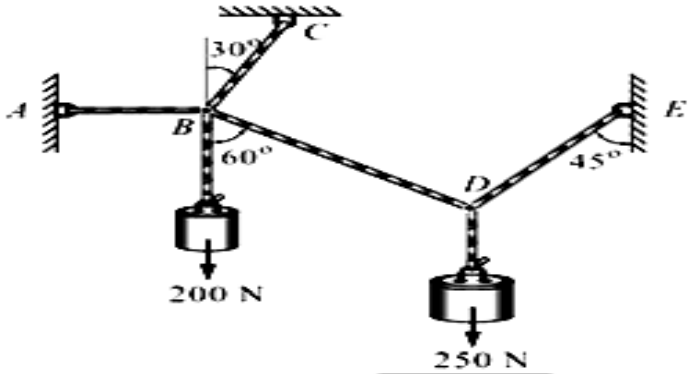
UNIT-I

1.	a)	State and prove Lami's theorem.	7 Marks	L3	CO1	PO1
	b)	Resolve each force acting on the post into its *x* and *y* components and determine the magnitude and direction of resultant force.	7 Marks	L4	CO1	PO6



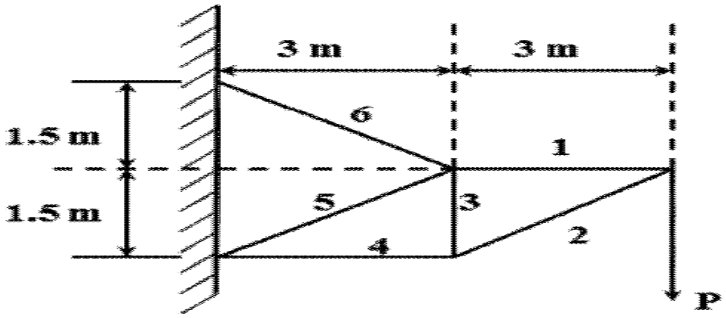
(OR)

2.	a)	What is Newton's first law of motion and law of transmissibility of forces?	7 Marks	L3	CO1	PO2
	b)	A system of connected flexible cables shown in fig. is supporting two vertical forces 200N and 250N at points B and D. Determine the forces in various segments of the cable.	7 Marks	L4	CO1	PO4



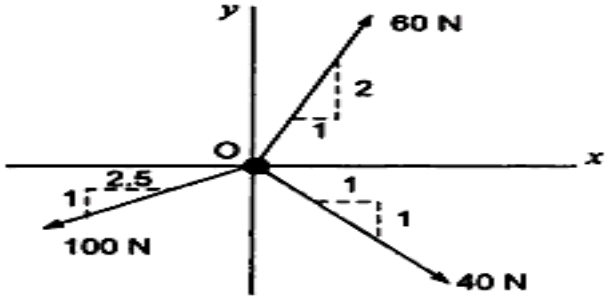
UNIT-II

3.	a)	State and explain varignon's thorem.	7 Marks	L3	CO2	PO1
	b)	Determine the axial force in each bar of the plane truss loaded as shown in the figure.	7 Marks	L4	CO2	PO2



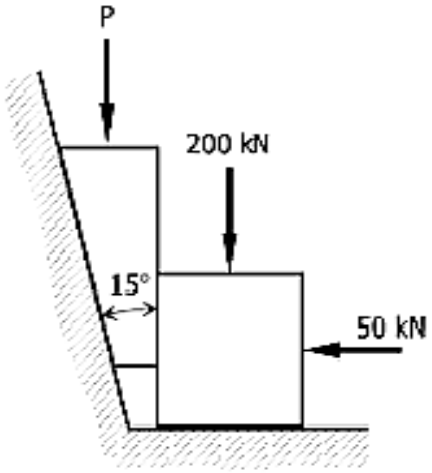
(OR)

4.	a)	Explain the concept of moment of a force about a point. For what condition the moment of a force will be zero?	7 Marks	L3	CO2	PO1
	b)	Determine analytically the equilibrant of the three coplanar forces shown in Fig. The slopes of the force directions are indicated in the Fig.	7 Marks	L4	CO2	PO3



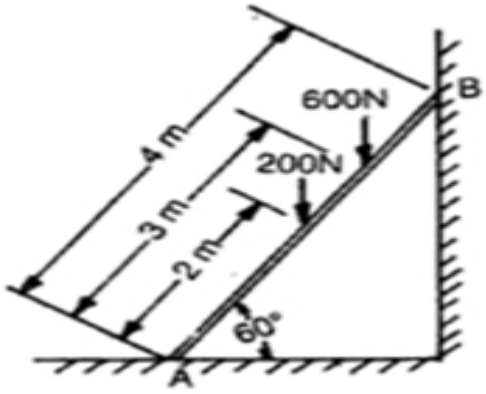
UNIT-III

5.	a)	State the laws of dry friction.	4 Marks	L3	CO3	PO1
	b)	Referring to the Figure the coefficient of friction is as follows: 0.25 at the floor, 0.30 at the wall, 0.20 between the blocks. Find the minimum value of a horizontal force P applied to the lower block that will hold the system in equilibrium.	10 Marks	L4	CO3	PO3



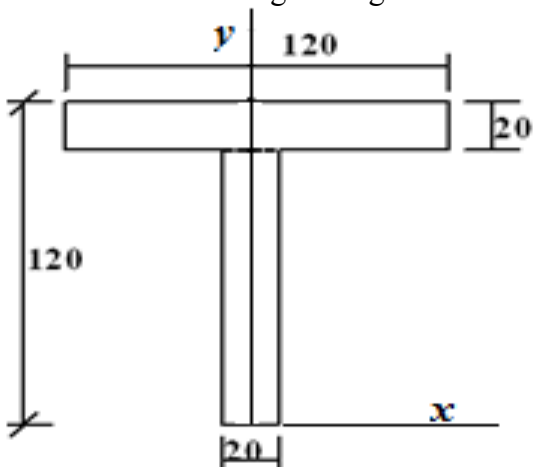
(OR)

6.	a)	Define wedge and write the equilibrium conditions for ladder friction.	4 Marks	L3	CO3	PO1
	b)	Determine the minimum horizontal force to be applied at A to prevent slipping. $\mu = 0.2$ between the wall and ladder, $\mu = 0.3$ between the floor and ladder. The ladder weighs 200N and a man weighing 600 N is at 3m from A.	10 Marks	L4	CO3	PO2



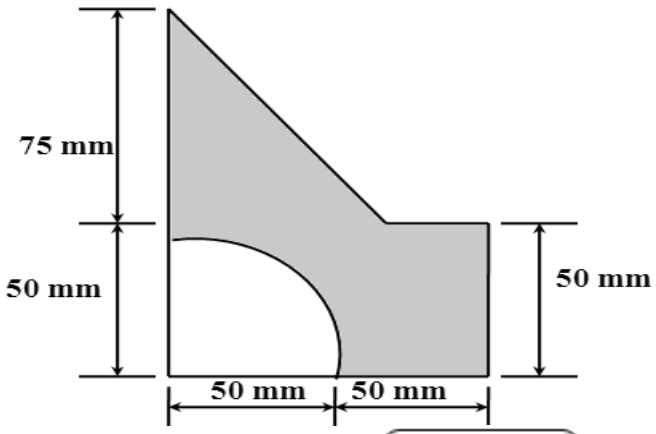
UNIT-IV

7.	a)	State and prove theorems of Pappus-Guldinus.	8 Marks	L3	CO4	PO1
	b)	Find the Moment of inertia of the given figure about the X-axis.	6 Marks	L4	CO4	PO2



(OR)

8.	a)	State and prove perpendicular axis theorem for area moment of inertia.	5 Marks	L3	CO4	PO1
	b)	With respect to coordinate axes x and y, locate the centroid C of the shaded area as shown in the figure.	9 Marks	L4	CO4	PO2



UNIT-V

9.	a)	Find amplitude and time period of a particle moving with SHM, which has a velocity of 9m/s and 16 m/s at the distance of 3m and 4m respectively from the centre.	8 Marks	L4	CO4	PO1
	b)	A mass of 2 kg is supported on as isolator having a spring scale of 2940 N/m and viscous damping. If the amplitude of free vibration of the mass falls to one half it original value in 1.5 seconds, determine the damping coefficient of the isolator.	6 Marks	L4	CO4	PO3

(OR)

10.	a)	State and explain D'Alembert's principle.	8 Marks	L3	CO4	PO1
	b)	A body moving with simple harmonic motion has amplitude of 1 m and a period of oscillation of 2 seconds. What will be its velocity and acceleration 0.4 seconds after passing an extreme position?	6 Marks	L4	CO4	PO3

❀ ❀ ❀

CODE No.: 20BT20501 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-20) Regular Examinations September – 2021

DIGITAL LOGIC DESIGN

Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Science)]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Express the following numbers in decimal: i) (26.24)8 ii) (16.5)16.	6 Marks	L3	CO1	PO1
	b)	Perform the following subtraction in binary using 1's and 2's complement method: (677)10 – (899)10.	8 Marks	L3	CO1	PO1
		(OR)				
2.	a)	Implement the following Boolean function with only two input NOR gates: F=(AB'+CD')E+BC(A+B).	7 Marks	L3	CO1	PO1
	b)	Explain the Theorems of Boolean algebra.	7 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Implement the following Boolean function with only two input NAND gates: F=(AB'+D')E+C(A'+B') .	7 Marks	L4	CO2	PO2
	b)	Simplify the following Boolean function with the don't conditions d using Kmap method: F(A, B, C, D)=Σ(1,3,8,10,15); d(A, B, C, D)=Σ(0, 2, 9).	7 Marks	L4	CO2	PO2
		(OR)				
4.	a)	Simplify the following using K-map and implement the same using NAND gates. Y (A, B, C) = ∑ (0, 3, 4, 5, 7).	7 Marks	L4	CO2	PO2
	b)	Reduce the following Boolean function to four literals and draw the logic diagram: (A'+C)(A'+C')(A+B+C'D).	7 Marks	L4	CO2	PO2
		UNIT-III				
5.	a)	Define Combinational Circuit. Explain Design Procedure for Combinational Circuit.	7 Marks	L2	CO3	PO3
	b)	Implement full adder using decoder and OR gates.	7 Marks	L4	CO3	PO3
		(OR)				
6.	a).	Design a 1:8 demultiplexer using two 1:4 demultiplexer.	7 Marks	L4	CO3	PO3
	b).	Define an encoder. Design octal to binary encoder.	7 Marks	L4	CO3	PO3
		UNIT-IV				
7.	a)	Convert JK flip-flop to T flip-flop.	7 Marks	L2	CO4	PO4
	b)	Draw the logic diagram of a JK flip-flop and using excitation table explain its operation.	7 Marks	L4	CO4	PO4
		(OR)				
8.	a)	Draw and Explain Bidirectional Shift Register.	7 Marks	L4	CO4	PO4
	b)	Design and explain about the Ring counter.	7 Marks	L4	CO4	PO4
		UNIT-V				
9.	a)	Design a BCD to Excess-3 code converter using a PAL.	8 Marks	L4	CO5	PO5
	b)	Compare PROM, PLA and PAL.	6 Marks	L2	CO5	PO5
		(OR)				
10.		Implement the following Boolean functions using PLA. A(x,y,z)=∑(1,2,4,6); B(x,y,z)= ∑(0,1,6,7); C(x,y,z)= ∑(2,6).	14 Marks	L4	CO5	PO5

CODE No.: 20BT20541 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-20) Regular Examinations September – 2021

PROGRAMMING IN C AND DATA STRUCTURES

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Compare and contrast flowchart and algorithm.	7 Marks	L4	CO1	PO1
	b)	Write an algorithm, find the sum of the given **n** numbers.	7 Marks	L3	CO1	PO2
		(OR)				
2.	a)	List and explain various operators used in C with examples and evaluate expression K=3/2 * +3/8+3.	9 Marks	L2	CO1	PO1
	b)	Write a C program to generate electricity bill.	5 Marks	L3	CO1	PO2
		UNIT-II				
3.		List and explain about different input and output functions with examples.	14 Marks	L2	CO2	PO3
		(OR)				
4.	a)	Differentiate between while and do-while statements. Give examples.	7 Marks	L4	CO2	PO1
	b)	Write a program to find the factorial of a given number.	7 Marks	L3	CO2	PO4
		UNIT-III				
5.	a)	What is dynamic array? How is it created? Give example.	7 Marks	L1	CO3	PO2
	b)	Write a program to perform matrix multiplication.	7 Marks	L3	CO3	PO2
		(OR)				
6.	a)	What is user defined functions? Discuss with an example.	7 Marks	L1	CO3	PO1
	b)	Write a recursive function to find GCD value.	7 Marks	L3	CO3	PO4
		UNIT-IV				
7.	a)	How is a pointer initialized? Discuss about the importance of pointers.	7 Marks	L1	CO3	PO1
	b)	Describe self-referential structure and nested structure with suitable examples.	7 Marks	L4	CO3	PO2
		(OR)				
8.		Explain about different types of lists.	14 Marks	L2	CO3	PO2
		UNIT-V				
9.	a)	Define Queue. Explain its concept.	7 Marks	L1	CO3	PO3
	b)	Write a program to implement Queue using arrays.	7 Marks	L3	CO3	PO4
		(OR)				
10.	a)	Explain about Selection sort with an example.	7 Marks	L2	CO4	PO1
	b)	Write an algorithm for Linear search and give an example.	7 Marks	L3	CO4	PO4

CODE No.: 20BT21501 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-20) Regular Examinations September – 2021

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Science), Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Describe objects with example program.	7 Marks	L1	CO1	PO1
	b)	Write a program to find factorial of given number using classes.	7 Marks	L6	CO1	PO1
		(OR)				
2.	a)	Describe Garbage collection with relevant example.	7 Marks	L1	CO1	PO1
	b)	Solve any java program using constructors.	7 Marks	L3	CO1	PO1
		UNIT-II				
3.	a)	Compare method overloading and constructor overloading.	7 Marks	L2	CO3	PO3
	b)	Write a program to find area of triangle using parameter passing.	7 Marks	L6	CO2	PO3
		(OR)				
4.	a)	Develop a program to display prime numbers between 40 and 100.	7 Marks	L6	CO2	PO1
	b)	Describe type conversions and casting with examples.	7 Marks	L1	CO2	PO1
		UNIT-III				
5.	a)	Design a program to find area of rectangle and triangle using abstract methods and classes.	7 Marks	L6	CO3	PO2
	b)	Illustrate packages with example java program.	7 Marks	L4	CO2	PO3
		(OR)				
6.	a)	Explain Block Lambda expressions with examples.	7 Marks	L1	CO3	PO3
	b)	Develop a program to implement nested interfaces.	7 Marks	L6	CO2	PO2
		UNIT-IV				
7.	a)	Illustrate multiple catch statements with example program.	7 Marks	L4	CO3	PO2
	b)	Design a program to convert an Array List into an array.	7 Marks	L6	CO3	PO3
		(OR)				
8.	a)	Describe synchronization with example program.	7 Marks	L1	CO4	PO1
	b)	Plan nested try statements using Java Program.	7 Marks	L5	CO3	PO3
		UNIT-V				
9.	a)	Develop a program to create a vertical and horizontal scroll bars.	7 Marks	L6	CO5	PO3
	b)	Design a program to demonstrate the functionality of adapter classes.	7 Marks	L6	CO5	PO2
		(OR)				
10.	a)	Develop a code to create swing application.	7 Marks	L6	CO5	PO3
	b)	Design a program for java event handling by outer class.	7 Marks	L6	CO5	PO3

CODE No.: 20BT22901 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-20) Regular Examinations September – 2021

DATA STRUCTURES AND ALGORITHMS

[Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define data structure and discuss how performance analysis is measured for an algorithm.	6 Marks	L2	CO1	PO1
	b)	Illustrate the result of each pass of selection sort for the following. 2, 3 78, 5, 46, 32, 56, 8, 99, 9.	8 Marks	L3	CO2	PO2
		(OR)				
2.	a)	Write the algorithm for insertion sort and write its time complexity.	8 Marks	L2	CO2	PO2
	b)	Distinguish between binary search and linear search. In searching point of view, which of the two algorithms is best?	6 Marks	L2	CO2	PO2

UNIT-II

3.	a)	Write a program to create a double linked list and insert a node at the middle.	7 Marks	L2	CO3	PO2
	b)	Illustrate with an example on how circular double linked list are created.	7 Marks	L2	CO3	PO2
		(OR)				
4.	a)	List and explain applications of linked lists.	5 Marks	L 2	CO4	PO2
	b)	Write an algorithm insertion operation of singly linked list.	9 Marks	L2	CO3	PO2

UNIT-III

5.	a)	Write an algorithm to insert and delete elements in a linear queue.	7 Marks	L 2	CO4	PO2
	b)	Write an algorithm to implement stack operations.	7 Marks	L2	CO4	PO2
		(OR)				
6.	a)	Define queue. Discuss various types of queues and the operations that can be performed.	5 Marks	L 2	CO4	PO2
	b)	Convert the given infix expression to postfix expression using stack (a+b*c^d)*(e+f/g).	9 Marks	L3	CO4	PO3

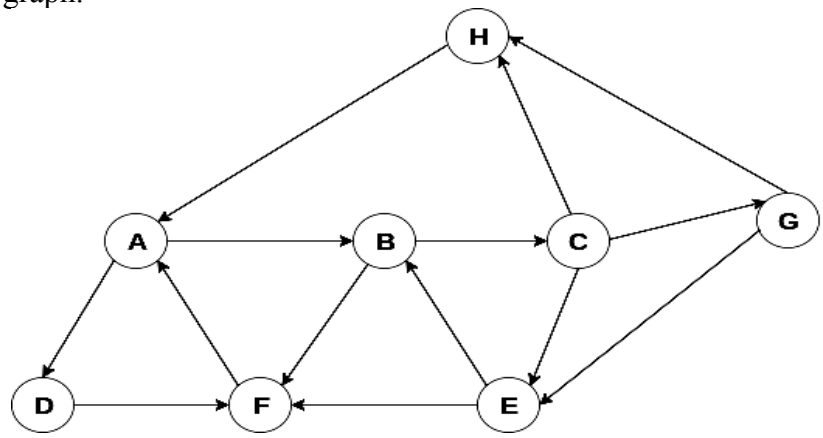
UNIT-IV

7.	a)	Construct a binary search tree whose post order traversal is : 5, 4, 9, 11, 12, 8, 13 and 7.	8 Marks	L3	CO5	PO2
	b)	Write non-recursive procedures for preorder traversals of a binary tree.	6 Marks	L2	CO5	PO2
		(OR)				
8.	a)	Illustrate with an example on how single rotation takes place in AVL trees.	7 Marks	L 3	CO5	PO2
	b)	The order of nodes of a binary tree in Preorder and Inorder traversal are as given below. Preorder Sequence: A B D G H C E F I K J In order Sequence: B G H D A E I C K F J Draw the corresponding binary tree	7 Marks	L4	CO5	PO2

UNIT-V

9.		Distinguish between B Tree and B+ tree. Create a B tree of order 5 by inserting the following elements: 3,14,7,1,8,5,11,17,13,6,23,12,20,26,4,16,18,24,28 and 19.	14 Marks	L 3	CO5	PO2

(OR)

10.	a)	Implement Breadth First Search algorithm for the following graph. 	10 Marks	L3	CO5	PO2
	b)	Write short note on hashing.	4 Marks	L 1	CO6	PO2

CODE No.: 16BT1BS01 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

ENGINEERING CHEMISTRY

[Civil Engineering; Mechanical Engineering; Computer Science and Engineering; Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Discuss briefly about boiler troubles and methods to be adapted for their treatment. 14 Marks

(OR)

2 a) Explain Nalgonda method used for Defluoridation of water and list out the merits and demerits of various deflouridation methods. 7 Marks

b) What is the threshold level of fluoride in ground water? Discuss the adverse effects of fluorides on human health 7 Marks

UNIT-II

3 a) Discuss about: 7 Marks
i) particulate composites. ii) layered composites.

b) Give the potential applications of biodegradable polymers. 7 Marks

(OR)

4 Define doped conducting polymer. Illustrate p-doped and n-doped conducting polymers. 14 Marks

UNIT-III

5 a) Outline the role of Green Chemistry in our day-to-day life. 7 Marks

b) Summarize the commercial applications of bio-diesel. 7 Marks

(OR)

6 Explain the following tools with suitable examples. 14 Marks
i) Alternative feed stocks.
ii) Alternative products.
iii) Alternative reaction conditions.

UNIT-IV

7 Define sensor. Explain the working principle and construction of potentiometric sensor. 14 Marks

(OR)

8 Classify the sensors with examples and give the applications of electrochemical sensor. 14 Marks

UNIT-V

9 Outline the method of electroplating for the control of corrosion. Apply it for nickel electroplating. 14 Marks

(OR)

10 a) Classify the lubricants based on their state. 7 Marks

b) Examine the influence of ‘pH’ and ‘purity of metal’ on the rate of corrosion. 7 Marks

❀ ❀ ❀

CODE No.: 16BT1BS02 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

ENGINEERING PHYSICS

[Electrical and Electronics Engineering, Electronics and Communications Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the characteristics of a laser.	6 Marks
	b)	Distinguish spontaneous and stimulated emission of radiation. Define life time of an atom and metastable state.	8 Marks

(OR)

2	a)	Derive the relation between the probabilities of spontaneous emission and stimulated emission in terms Einstein coefficients.	9 Marks
	b)	What is population inversion in lasers? Describe various methods of achieving population inversion.	5 Marks

UNIT-II

3	a)	Formulate one dimensional Schrodinger's time independent wave equation and discuss the physical significance of wave function.	10 Marks
	b)	A quantum particle confined to one dimensional box of width of 'a' is known to be in its first exited state. Determine the probability of the particle in the central half.	4 Marks

(OR)

4		Evaluate expressions for Eigen function and Eigen values for the particle in one dimensional potential box of length 'L'.	14 Marks

UNIT-III

5	a)	Classify different types of semiconductor.	4 Marks
	b)	Derive an expression for intrinsic carrier concentration in an intrinsic semiconductor.	10 Marks

(OR)

6	a)	What is intrinsic Semiconductor?	4 Marks
	b)	Derive the expression for electron concentration in an intrinsic semiconductor.	10 Marks

UNIT-IV

7	a)	Define Reverberation time. Formulate Sabine's mathematical relation for reverberation time of the Hall. The volume of a hall is 2265 m^3 and its absorption is equal to 92.9 m^2 of open window. If the hall is filled with audience, then the absorption becomes double. Find the reverberation time when the hall is without and with audience.	10 Marks
	b)	Outline the three basic requirements of an acoustically good hall.	4 Marks

(OR)

8	a)	Explain the various factors affecting the architectural acoustics of a building and their remedies.	8 Marks
	b)	Discuss the following: i) Reverberation. ii) Reverberation time. iii) Echelon effect. iv) Absorption coefficient.	6 Marks

UNIT-V

9	a)	Explain crystal planes and crystal direction.	4 Marks
	b)	Derive the expression for inter-planar distance between consecutive planes for a cubic system.	10 Marks

(OR)

10		Describe the procedure to find the Miller Indices and its mention significance. Draw the planes of (111) (110) (112) (100) and directions of [111] [100] in a cubic lattice.	14 Marks

CODE No.: 16BT1BS03 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

MATRICES AND NUMERICAL METHODS

[Civil Engineering, Mechanical Engineering, Electrical and Electronics Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Define the Quadratic form and reduce $x^2 + 4y^2 + z^2 + 4xy + 6yz + 2zx$ to canonical form by technique of orthogonal transformation and hence find its rank index and signature. 14 Marks

(OR)

2 Define rank, index, signature of a quadratic form. Reduce $5x^2 + 26y^2 + 10z^2 + 4yz + 14zx + 6xy$ to canonical form by orthogonal reduction technique. Hence find index, Signature and nature of the quadratic form. 14 Marks

UNIT-II

3 a) Construct a second degree polynomial to the following data using technique of least square principle. 7 Marks

x	10	15	20	25	30	35
y	35.3	32.4	29.2	26.1	23.2	20.5

b) Construct by the technique of least squares fit a curve of the form $y = ae^{bx}$ to the following data. 7 Marks

x	0	2	4
y	5.1	10	31.1

(OR)

4 a) Using method of least square, fit a straight line $y = a + bx$ to the following data. 7 Marks

x	0	5	10	15	20	25
y	12	15	17	22	24	30

b) Applying method of least square principle, construct a curve of the Form $y = ae^{bx}$ to the following data. 7 Marks

x	77	100	185	239	285
y	2.4	3.4	7.0	11.1	19.6

UNIT-III

5 a) State Newton's backward interpolation formula and using it evaluate $\cos 73^0$ from the following data. 7 Marks

x^0	10	20	30	40	50	60	70	80
$\cos x^0$	0.9848	0.9397	0.8660	0.7660	0.6428	0.5000	0.3420	0.1737

b) State Lagrange's interpolation formula and using it find the value of y when x = 10 from the following data. 7 Marks

x	5	6	9	11
y	12	13	14	16

(OR)

6 a) Prove the results (i) $\Delta = \frac{\delta^2}{2} + \delta\sqrt{1+\frac{\delta^2}{4}}$. (ii) $\mu\delta = \frac{1}{2}\Delta E^{-1} + \frac{1}{2}\Delta$. 7 Marks

b) Write Newton's backward interpolation formula and using it estimate the value of $f(42)$ from the following data. 7 Marks

x	20	25	30	35	40	45
$f(x)$	354	332	291	260	231	204

UNIT-IV

7 a) Determine the first and second derivatives of the function tabulated below at the point $x = 1.5$. 7 Marks

x	1.5	2.0	2.5	3.0	3.5	4.0
y	3.375	7.0	13.625	24.0	38.875	59.0

b) Evaluate $\int_0^1 x^3 dx$ with five sub-intervals by Trapezoidal rule. 7 Marks

(OR)

8 a) The following data gives the velocity of a particle for 20 seconds at an interval of 5 seconds. Obtain the initial acceleration using the data. 7 Marks

Time(t sec)	0	5	10	15	20
Velocity v(m/sec)	0	3	14	69	228

b) Evaluate $\int_0^6 x\sec x dx$ taking eight sub intervals by Trapezoidal rule. 7 Marks

UNIT-V

9 a) Calculate $y(0.3)$ from $y' = x^2 + y^2, y(0) = 1$ by apply Milne's Predictor-Corrector method. Take the straight values $y(-0.1) = 0.9087$, $y(0.1)=1.1113$, $y(0.2)=1.2506$. 7 Marks

b) Compute the value of y(0.2) by Euler's method, given $y' = x + y^2, y = 1$ at $x=0$. 7 Marks

(OR)

10 a) Given the differential equation $y' = x^2(1+y)$ with $y(1) = 1$, $y(1.1) = 1.233$, $y(1.2) = 1.548$, $y(1.3)=1.974$. Estimate y(1.4) using Milne's Predictor – Corrector method. 7 Marks

b) Given that $\frac{dy}{dx} = 2 + \sqrt{xy}$ and $y = 1$ when $x = 1$. Find approximate value of y at $x = 2$ in steps of h=0.2, using Euler's modified method. 7 Marks

❀ ❀ ❀

CODE No.: 16BT1BS04 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

MULTI-VARIABLE CALCULUS AND DIFFERENTIAL EQUATIONS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Design a mathematical equation of the family of orthogonal trajectories to the curves $a\,y^2 = x^3$ where a is the parameter. 7 Marks

b) Check whether the two families of curves given by $x^2 - y^2 = a^2$ and $xy = c^2$ are mutually orthogonal to each other or not and justify your answer. 7 Marks

(OR)

2 a) Design a mathematical equation for the orthogonal trajectories of the family of curves $r = 2a\,(\cos\theta + \sin\theta)$. 7 Marks

b) If the temperature of the body is changing from 100°C to 70°C in 15 minutes estimate the time for which the body comes to 40°C, the temperature of air being 30°C. 7 Marks

UNIT-II

3 a) A circuit has in series on electromotive force given by E = 100 (sin 40t) volts. A resistor of 10Ω and an inductor of 0.5 H. If the initial current is 0 find the current at time $t > 0$. 7 Marks

b) A conductor of capacity C discharged through an inductance L and resistance R in series and the charge q at time t satisfies the equation $L\frac{d^2q}{dt} + R\frac{dq}{dt} + \frac{q}{C} = 0$. Given that L = 0.25 henries , R = 250Ω C = 2 x 10^{-6} farads and that when t = 0, charge q = 0.02 coulombs and the current $\frac{dq}{dt} = 0$. Estimate the value of q in terms of t. 7 Marks

(OR)

4 For an L – R – C circuit, the charge q on a plate of the condenser is given by $L\frac{d^2q}{dt} + R\frac{dq}{dt} + \frac{q}{C} = E\sin\omega t$ where $i = \frac{dq}{dt}$ The circuit is turned to resonance so that $\omega^2 = \frac{1}{LC}$. If $CR^2 < 4L$ and initially q = 0 ,i = 0 then show that $q = \frac{E}{R\omega}\left[e^{\frac{Rt}{2L}}\left(\cos pt + \frac{R}{2LP}\sin pt\right) - \cos\omega t\right]$ where $p^2 = \frac{1}{LC} - \frac{R^2}{4L^2}$ and $i = \frac{E}{R}\left[\sin\omega t - \frac{1}{p\sqrt{LC}}e^{-\frac{Rt}{2L}}\sin pt\right]$. 14 Marks

UNIT-III

5 a) Examine the function for extreme values $f(x,y) = x^4 + y^4 - 2x^2 + 4xy - 2y^2$ **(x> 0 , y > 0)**. 7 Marks

b) Evaluate three positive numbers whose sum is 100 and whose product is maximum. 7 Marks

(OR)

6 a) Expand in Taylor series the function $e^x \cos y$ about the point $(1, \frac{\pi}{4})$. 7 Marks

b) Making use of the Lagrange's method of multipliers, find the maximum or minimum of $u = x^2 + y^2 + z^2$ subject to the conditions $ax^2 + by^2 + cz^2 = 1$ *and* $lx + my + nz = 0$. 7 Marks

UNIT-IV

7 Change the order of integration, evaluate $\int_0^{4a} \int_{x^2/4a}^{2\sqrt{ax}} dydx$ 14 Marks

(OR)

8 Evaluate $\int_0^1 \int_{x^2}^{2-x} xydxdy$ by the change of order technique. 14 Marks

UNIT-V

9 a) State Greens theorem in a place and verify it for $\oint (3x^2 - 8y^2)dx + (4y - 6xy)dy$ where C is the region bounded by y = √x and y = x². 7 Marks

b) State stokes theorem and applying it evaluate $\oint_C ydx + zdy + xdz$ where C is the curve of intersection of the sphere $\mathbf{x^2 + y^2 + z^2 = a^2}$ and $\mathbf{x + z = a}$. 7 Marks

(OR)

10 a) State stokes theorem and applying it show that curlgrad $\phi = \bar{0}$. 7 Marks

b) State Gauss divergence theorem and use it to evaluate $\iint (yz^2\bar{i} + xz^2\bar{j} + 2z^2\bar{k}) \cdot d\bar{s}$. where S is the closed surface bounded by xy – plane and the upper half of the sphere $\mathbf{x^2 + y^2 + z^2 = a^2}$ above this plane. 7 Marks

❀ ❀ ❀

CODE No.: 16BT10201 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations August - 2021

ELECTRIC CIRCUITS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) State ohm's law and give its applicability to electrical network and explain convention current direction and voltage across an element 7 Marks

b) Find the total power dissipated in the circuit shown in the Fig. 1 (All resistances are in ohms). 7 Marks

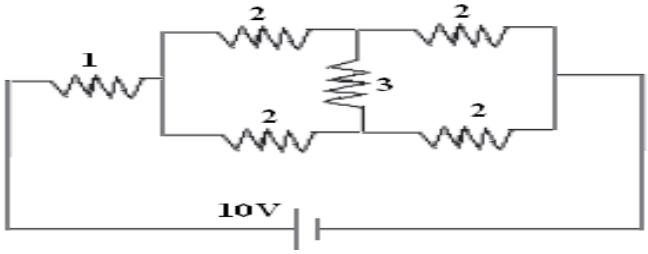


Fig. 1

(OR)

2 a) What are passive and active elements? Explain the volt-current relationship of passive elements with examples. 7 Marks

b) Using Kirchoff's current law, find the values of the currents i_1 and i_2 in the circuit shown in Fig. 2. 7 Marks

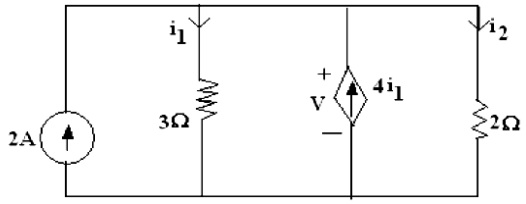


Fig. 2

UNIT-II

3 a) Derive the expression of resonant frequency for RLC series circuit shown in Fig.3 6 Marks

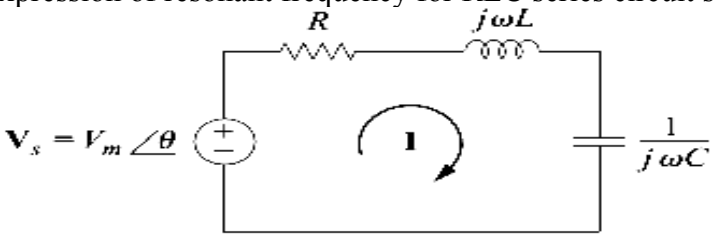


Fig. 3

b) For the circuit shown in Fig. 4 compute: 8 Marks

(i) Power factor. (ii) Average power delivered by the source.
(iii) Reactive power. (iv) Apparent power. (v) Complex power.

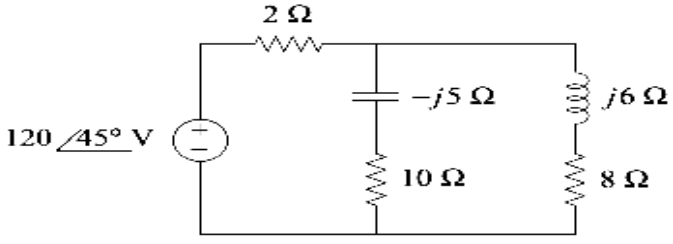


Fig. 4

(OR)

4 a) A series RLC circuit consists of R=100Ω, L = 0.02 H and C = 0.02 microfarad. Calculate frequency of resonance. A variable frequency sinusoidal voltage of constant RMS value of 50V is applied to the circuit. Find the frequency at which voltage across L and C is maximum and find maximum current in the circuit. 6 Marks

b) For the circuit shown in Fig. 5, find the load impedance Z_L that absorbs the maximum average power. Calculate that maximum average power. 8 Marks

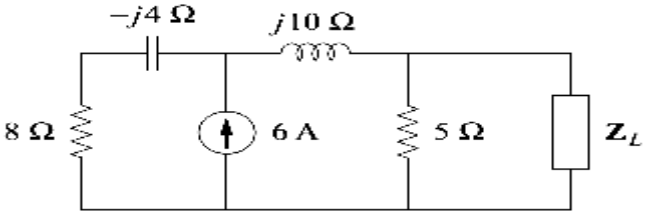


Fig. 5

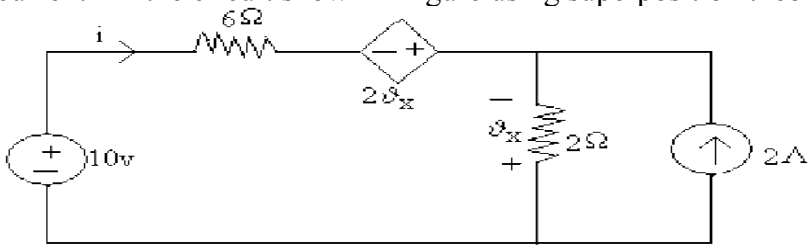
UNIT-III

5 State and explain Maximum power transfer theorem and derive the necessary conditions for maximum power transfer for DC and AC excitations. 14 Marks

(OR)

6 a) State and explain Maximum power transfer theorem and derive the necessary conditions for maximum power transfer for a DC excitations. 6 Marks

b) Find the current **i** in the circuit shown in figure using superposition theorem. 8 Marks



UNIT-IV

7 a) Elucidate the measurement of power and power factor of a balanced three phase load with neat sketch. 6 Marks

b) For the following Fig.6, the RMS value of the line voltage is 208 V. Find the average power delivered to the load. 8 Marks

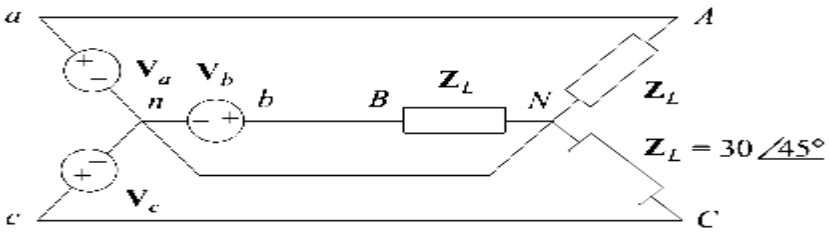


Fig. 6

(OR)

8 a) Explain how a single wattmeter can be used to measure the reactive power with the help of circuit connection and derive the necessary equations. 6 Marks

b) The unbalanced Δ-connected load of Fig.7 is supplied by balanced line-to-line voltage of 440V in the positive sequence. Find the line currents. Take V_{ab} as a reference. 8 Marks

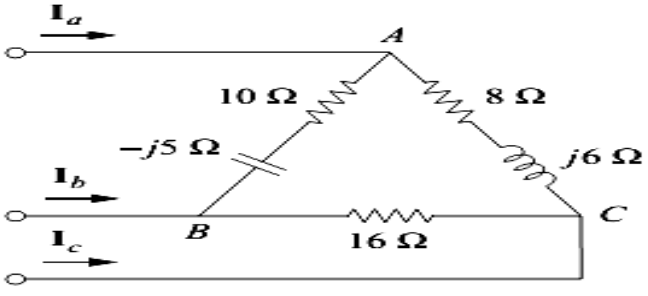


Fig. 7

UNIT-V

9 a) Derive the expressions for equivalent inductance of two coils in parallel with i) parallel aiding. ii) parallel opposition. 6 Marks

b) Find the input impedance of the circuit in Fig. 8 and the current from the voltage source. 8 Marks

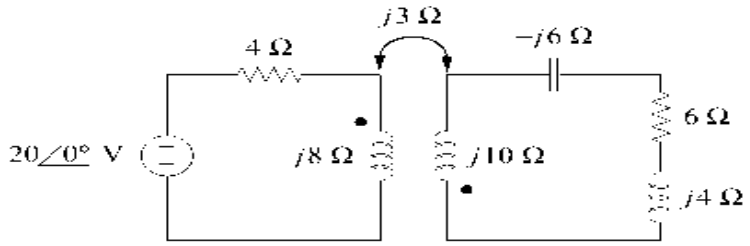


Fig. 8

(OR)

10 a) Derive the expressions for equivalent inductance of two coils in series with i) series aiding. ii) series opposition. 6 Marks

b) Calculate the mesh currents shown in Fig. 9 8 Marks

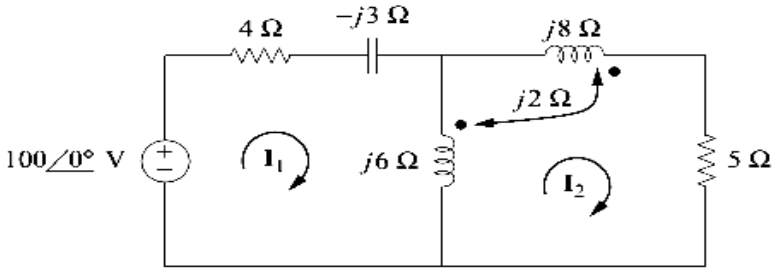


Fig. 9

CODE No.: 16BT10501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

PROGRAMMING IN C

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Define C character set and explain about the C tokens and Data types with examples.	14 Marks
		(OR)	
2	a)	Illustrate the structure of 'C' Program with an example.	7 Marks
	b)	List various steps to develop Programs in 'C'.	7 Marks

UNIT-II

3	a)	Demonstrate One way and Two way decision statements with example programs.	7 Marks
	b)	Write a 'C' Program that determines if a year is Leap Year (or) not.	7 Marks
		(OR)	
4		Write a 'C' Program that Prints Largest among Three numbers.	14 Marks

UNIT-III

5	a)	Define Function. Explain its syntax and advantages.	7 Marks
	b)	Write a 'C' Program to compute X^{n} where X is a any valid number and **n** is an Integer Value.	7 Marks
		(OR)	
6	a)	Define Array. Discuss 2-Dimensional and Multi-Dimensional Arrays with its syntax.	7 Marks
	b)	Write a 'C' Program that prints Fibonacci Series using Arrays.	7 Marks

UNIT-IV

7	a)	Define Pointer Data type. Write a 'C' Program using Pointers to exchange the contents of two variables.	7 Marks
	b)	Write a short note on Pointer Operators.	7 Marks
		(OR)	
8	a)	What is Pointer Arithmetic? Explain about Pointer Expressions.	7 Marks
	b)	Write a 'C' Program to Add 'N' numbers using Pointers.	7 Marks

UNIT-V

9	a)	With an example, explain how to Declare and Access Structures.	6 Marks
	b)	Write a 'C' Program to initialize Structure Members.	8 Marks
		(OR)	
10	a)	What is the use of typedef in structure declaration? Explain.	9 Marks
	b)	Write a 'C' Program to copy one structure into another.	5 Marks

❀ ❀ ❀

CODE No.: 16BT1BS01 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations February – 2021

ENGINEERING CHEMISTRY

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the following. i) Priming. ii) Foaming.	7 Marks
	b)	Write short note on internal treatment methods for softening of water.	7 Marks
		(OR)	
2	a)	What is the principle of reverse osmosis? Explain the process of reverse osmosis.	7 Marks
	b)	"Reverse osmosis is advantageous over ion exchange process" justify the statement	7 Marks

UNIT-II

3	a)	Differentiate short and long fibre-reinforced composites	7 Marks
	b)	What are the advantages of composite material? Mention its applications	7 Marks
		(OR)	
4		Write the synthesis, properties and applications of the following engineering plastics. i) Poly Carbonates. ii) Teflon.	14 Marks

UNIT-III

5		Discuss any three tools of Green Chemistry with examples.	14 Marks
		(OR)	
6		Write the twelve principles of Green Chemistry and evaluate their role on chemistry and environment.	14 Marks

UNIT-IV

7		Discuss the construction and working of Lithium-ion battery with the reactions occurring during charging and discharging. Mention the applications of Li-ion batteries.	14 Marks
		(OR)	
8		Define fuel cell. Explain the construction, working of H_2-O_2 fuel cell and its applications.	14 Marks

UNIT-V

9	a)	Define flash point and fire point of a lubricant and explain their significance.	7 Marks
	b)	Illustrate semi-solid lubricants with their uses.	7 Marks
		(OR)	
10	a)	Write short note on: i) Cloud and pour points. ii) Mechanical strength of lubricants.	7 Marks
	b)	Compare the terms viscosity and viscosity index	7 Marks

❀ ❀ ❀

CODE No.: 16BT1BS02 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations February – 2021

ENGINEERING PHYSICS

[Electrical and Electronics Engineering, Electronics and Communications Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the construction and working of a semiconductor laser. Give the applications of semiconductor laser.	10 Marks
	b)	Calculate the wavelength of emitted radiation from GaAs which has a band gap of 1.44 Ev.	4 Marks
		(OR)	
2	a)	What is an optical fiber? What is the principle involved in its working? Derive an expression for acceptance angle of an optical fiber and how it is related to numerical aperture.	10 Marks
	b)	The refractive indices of core and cladding materials of an optical fiber are 1.48 and 1.45 respectively. Calculate numerical aperture and acceptance angle	4 Marks

UNIT-II

3	a)	Explain origin of energy band formation in solids.	4 Marks
	b)	Distinguish between conductors, insulators and semiconductors based on band theory. An electron is bound in one dimensional infinite well of width 1×10^{-10} m then find the energy values in the ground state and in the first two excited states.	10 Marks
		(OR)	
4	a)	Explain de-Broglie hypothesis.	8 Marks
	b)	Find the velocity and kinetic energy of an electron having wavelength 1.66Å.	6 Marks

UNIT-III

5	a)	Write a note on extrinsic semiconductors. How they are formed?	6 Marks
	b)	Obtain an expression for the electrical conductivity in semiconductors.	8 Marks
		(OR)	
6		Predict the theory behind the formation of p-n junction and explain its energy band diagram.	14 Marks

UNIT-IV

7	a)	How the reverberation and reverberation time influences the acoustically good hall?	6 Marks
	b)	Distinguish between echo and reverberation. A hall with a volume of 1000m^3 has a sound absorbing surface of area of 400m^2. If the average absorption coefficient of the hall is 0.2 sabine, what is the reverberation time of the hall?	8 Marks
		(OR)	
8	a)	Elaborate Meissner's effect.	7 Marks
	b)	Distinguish between Type-I and Type-II superconductors.	7 Marks

UNIT-V

9	a)	How X-rays are suitable in determination of crystal structure.	4 Marks
	b)	State and explain Bragg's law for diffraction in crystals. Calculate the glancing angle at (110) plane of a cubic crystal having lattice constant of 0.26 nm corresponding to the second order diffraction maximum for the X-rays having wavelength of 0.65 nm.	10 Marks

(OR)

10	a)	Explain the principle factors which affect the properties of nanomaterials.	5 Marks
	b)	Discuss in detail about the fabrication of nanomaterials by pulsed laser deposition.	9 Marks

CODE No.: 16BT1BS03 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations February – 2021

MATRICES AND NUMERICAL METHODS

[Civil Engineering, Mechanical Engineering, Electrical and Electronics Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Construct the diagonal matrix $A=\begin{bmatrix} 8 & -8 & -2 \\ 4 & -3 & -2 \\ 3 & -4 & 1 \end{bmatrix}$ 14 Marks

(OR)

2 Define modal matrix and spectral matrix. Determine the modal matrix P of $A=\begin{bmatrix} -2 & 2 & -3 \\ 2 & 1 & -6 \\ -1 & -2 & 0 \end{bmatrix}$ 14 Marks

UNIT-II

3 a) Estimate the value of y at $x = 3.5$ by fitting the curve of the form $y = a + bx + cx^2$ by method of least square principle to the following data 7 Marks

x	1	2	3	4	5	6	7
y	2.3	5.2	9.7	16.5	29.4	35.5	54.4

b) Determine the values of a and b and fit an exponential curve of the form $y = ae^{bx}$ that best fits the following data 7 Marks

X	0	1	2	3
Y	1.05	2.10	3.85	8.30

(OR)

4 a) Construct a straight line by method of least square principle to the following data 7 Marks

x	1	2	3	4	5
y	4	3	6	7	11

b) Using the technique of least squares, fit the parabola $y = a + bx + cx^2$ to the data $f(-1) = -2,\ f(0) = 1,\ f(1) = 2,\ f(2) = 4$ 7 Marks

UNIT-III

5 a) Evaluate the value of $\sin 1.747$ using the values given in the table below 7 Marks

x	1.70	1.74	1.78	1.82	1.86
$\sin x$	0.9916	0.9857	0.9781	0.9691	0.9584

b) Using the technique of Lagrange's interpolation, express the function $f(x) = \dfrac{3x^2 + x + 1}{(x-1)(x-2)(x-3)}$ as a sum of partial fractions. 7 Marks

(OR)

6 a) Define (i) Average operator (ii) Central difference operator and hence show that 7 Marks

$E^{\frac{1}{2}} = \mu + \frac{\delta}{2}$

b) State Newton's forward interpolation formula. Calculate the values of e^{185} from the following table 7 Marks

x	1.7	1.8	1.9	2.0	2.1	2.2	2.3
e^x	5.474	6.050	6.686	7.389	8.166	9.025	9.974

UNIT-IV

7 a) A Slider in a machine moves along a fixed straight rod. Its distance **x** cm along the rod is given below for various values of the time t seconds. Obtain the velocity and acceleration of the slider when $t = 0.1$ seconds. 7 Marks

t(sec)	0	0.1	0.2	0.3	0.4	0.5	0.6
x (cm)	30.13	31.62	32.87	33.64	33.95	33.81	33.24

b) Write Simpson's 3/8 rule and evaluate $\int_0^{\frac{1}{2}} \frac{1}{\sqrt{1-x^2}}\,dx$ applying it with n=6. 7 Marks

(OR)

8 a) The Velocity ***v*** of a particle moving in a straight line covers a distance **x** in time **t** related as follows. Estimate $f'(15)$ 7 Marks

x	0	10	20	30	40
v	45	60	65	54	42

b) Evaluate the following integral $\int_1^2 \frac{e^x}{x}\,dx$ using Simpson's $\frac{1}{3}$rd rule for $n = 4$ 7 Marks

UNIT-V

9 Write Runge-Kutta 4th order formulae and use it to evaluate $y(0.1)$ and $y(0.2)$ given $y' = x^2 - y$ and $y(0)=1$. Compare the numerical solution obtained with analytical solution. 14 Marks

(OR)

10 a) Write Milne's Predictor-Corrector formula and apply it to obtain the solution of the equation $y' = x - y^2$ at $x = 0.8$ given that 7 Marks

$y(0)=0,\ y(0.2) = 0.02,\ y(0.4) = 0.0795,\ y(0.6) = 0.1762.$

b) Estimate the value of y at $x = 0.1$ given that $y' = xy^2 - 1, y(0) = 1,$ by Taylor's series method. 7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations February – 2021

MULTI-VARIABLE CALCULUS AND DIFFERENTIAL EQUATIONS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology and Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Solve the differential equation $(x^2y - 2xy^2)dx - (x^3 - 3x^2y)dy = 0$ by reducing it into exact equation. 7 Marks

b) Find a solution for the differential equation 7 Marks
$(xy\sin xy + \cos xy)\,y\,dx + (xy\sin xy - \cos xy)\,x\,dy = 0$

(OR)

2 a) Identify the integrating factor and solve the differential equation 7 Marks
$(2xy + 1)\,y\,dx + (1 + 2xy - x^3y^3)\,x\,dy = 0$

b) Multiplying with the corresponding integrating factor, find a solution for the differential equation $2xy\,dy - (x^2 + y^2 + 1)\,dx = 0$ 7 Marks

UNIT-II

3 a) Applying the method of variation of parameters, solve the differential equation $(D^2 - 2D)y = e^x \sin x$ 7 Marks

b) Solve the equation $\frac{d^2y}{dx^2} - y = \frac{2}{1 + e^x}$ by the method of variation of parameters. 7 Marks

(OR)

4 a) Find a solution of the differential equation $(D^2 + a^2)y = \sec ax$ by using partial fractions 7 Marks

b) An uncharged condenser of capacity C is charged by applying an e.m.f. $E\sin(\frac{t}{\sqrt{LC}})$, through leads of self-inductance L and negligible resistance. Show that at any time t, the charge on one of the plates is $\frac{EC}{2}\left\{\sin\frac{t}{LC} - \frac{t}{\sqrt{LC}}\cos\frac{t}{\sqrt{LC}}\right\}$ 7 Marks

UNIT-III

5 a) Using the appropriate technique of finding stationary values, estimate the maximum and minimum values for the function $x^3 + y^3 - 3axy$ 7 Marks

b) Write the Taylor series for a function f(x,y) about a point (a,b) and hence expand the function $x^3 + y^3 + xy^2$ in powers of $(x - 1)$ *and* $(y - 2)$. 7 Marks

(OR)

6 a) By the technique of finding stationary values for the function $x^2y^2 - 5x^2 - 8xy - 5y^2$, decide at what points the function becomes maximum and minimum. 5 Marks

b) By the technique of Lagrange's undetermined multipliers establish a minimum value for $x^2 + y^2 + z^2$ subject to the condition $xyz = a^3$ 9 Marks

UNIT-IV

7 a) Evaluate $\iint (x^2 + y^2)dxdy$ in the positive quadrant for which $x + y \le 1$. 7 Marks

b) Evaluate $\iint (x + y)dxdy$ over the region of the positive quadrant bounded by the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$. 7 Marks

(OR)

8 a) Evaluate the following integral by the technique of transforming into polar coordinates $\int_0^a \int_0^{\sqrt{a^2 - x^2}} y\sqrt{x^2 + y^2}\,dxdy$. 7 Marks

b) Evaluate $\iint_R (1 - \frac{x^2}{a^2} - \frac{y^2}{b^2})dxdy$ over the first quadrant of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ using the transformations x = au and y = bv. 7 Marks

UNIT-V

9 a) Define flux of a vector point function across a surface and compute the flux of water through the parabolic cycloid $y = x^2$, $0 \le x \le 2$; $0 \le z \le 3$, if the velocity vector $\bar{V} = 3z^2\bar{i} + 6\bar{j} + 6xz\bar{k}$ m/sec. 6 Marks

b) By transforming into triple integral evaluate $\iint_S x^3 dydz + x^2 ydzdx + x^2 zdxdy$ where S is the closed surface consisting of the cylinder $\mathbf{x^2 + y^2 = a^2}$ and the circular discs z = 0 and z = b 8 Marks

(OR)

10 a) Define surface integral and evaluate $\int_S \bar{F} \cdot \bar{n}dS$ where $\bar{F} = z\bar{i} + x\bar{j} - 3y^2z\bar{k}$ and S is the surface $\mathbf{x^2 + y^2 = 16}$ included in the first octant between z = 0 and z = 5. 9 Marks

b) State Gauss divergence theorem and use it to evaluate $\iint_S \bar{F} \cdot dS$ where $\bar{F} = 4x\bar{i} - 2y^2\bar{j} + z^2\bar{k}$ and S is the surface of the closed region bounded by $\mathbf{x^2 + y^2 = 4}$, z = 0 and z = 3. 5 Marks

CODE No.: 16BT1HS01 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations February – 2021

TECHNICAL ENGLISH

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	Discuss the various types of communication, explaining in detail verbal and non-verbal communication.	14 Marks
	(OR)	
2	Distinguish between Intrapersonal, Interpersonal and Organisational barriers to communication.	14 Marks

UNIT-II

3	Discuss the barriers which affect the process of listening and suggest methods to overcome the barriers.	14 Marks
	(OR)	
4	State the factors on which the listening modes depend and elaborate on different kinds of listening modes.	14 Marks

UNIT-III

5	Distinguish semi-formal and informal speaking with examples.	14 Marks
	(OR)	
6	State the importance of reasoning and emotional appeal in persuasive speaking.	14 Marks

UNIT-IV

7	Provide guidelines to enhance reading rate.	14 Marks
	(OR)	
8	Explain the various purposes of reading.	14 Marks

UNIT-V

9	Describe how you achieve conciseness and flow in technical writing, with the help of suitable examples.	14 Marks
	(OR)	
10	Define the terms clichés and Jargon with examples and how to avoid them.	14 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations February – 2021

ELECTRIC CIRCUITS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Using nodal method, find the battery current in the circuit of Fig. 1. 14 Marks

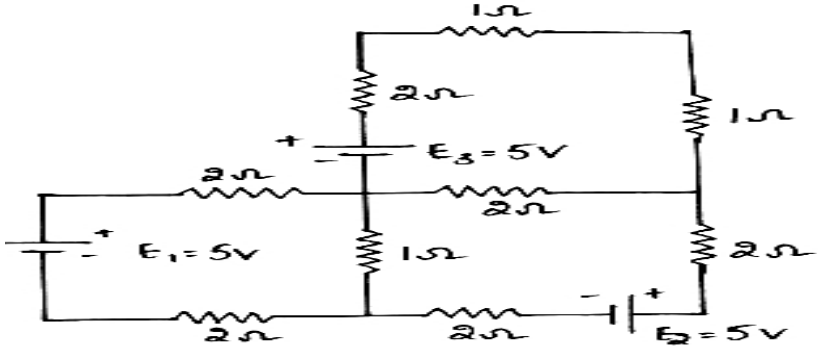


Fig. 1

(OR)

2 a) Explain the concept of dual and duality in electrical circuits. 7 Marks

b) Find the loop currents i_1, i_2 and i_3 in the network of Fig.2 by mesh method. 7 Marks

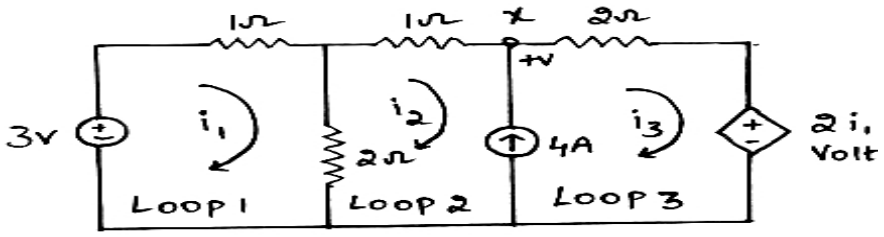


Fig. 2

UNIT-II

3 a) Derive the expression of resonant frequency for RLC parallel circuit shown in Fig. 3 6 Marks

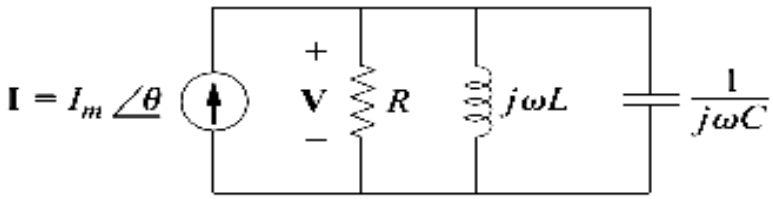


Fig. 3

b) Find the RMS value of the current waveform of Fig. 4, if the current flows through a 9Ω resistor, calculate the average power absorbed by the resistor. 8 Marks

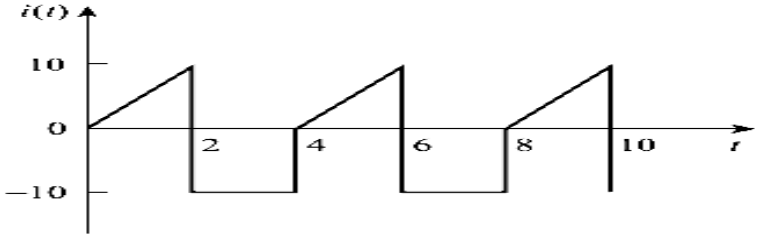


Fig. 4

(OR)

4 a) Develop the relation between resonant frequency and half-power frequencies for 6 Marks

RCL series circuit shown in Fig. 5

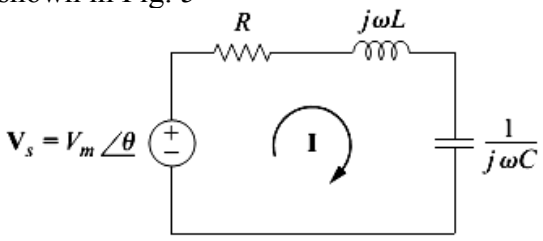


Fig. 5

b) In the parallel RLC circuit of Fig. 6, assume R=8kΩ, L=0.2mH and C=8μF then calculate Resonant frequency, Half-power frequencies, Bandwidth and Quality factor. 8 Marks

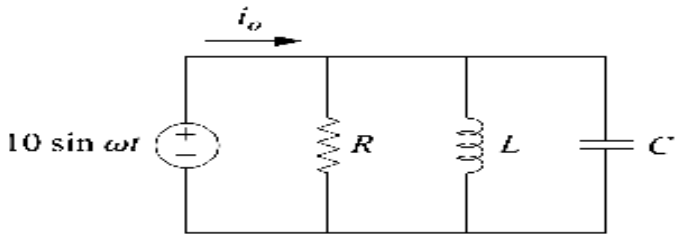


Fig. 6

UNIT-III

5 a) State and explain Millman's theorem. 7 Marks

b) Find the current through load resistance RL and also find the voltage drop across load using Millman's theorem shown in figure Fig. 7. 7 Marks

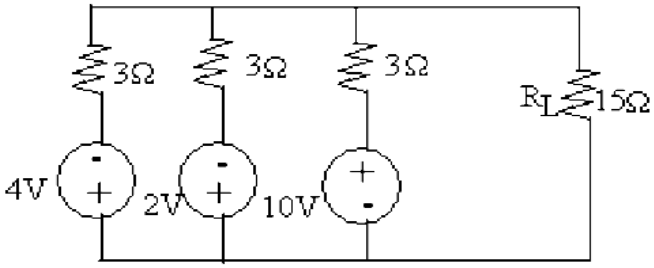
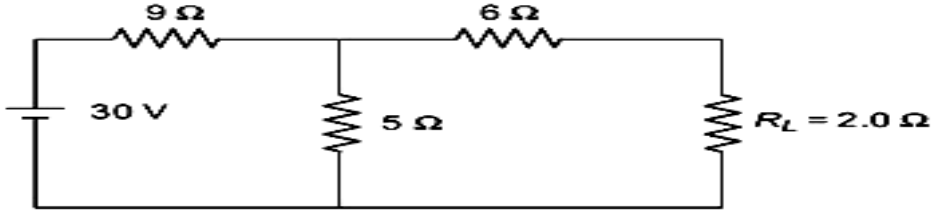


Fig. 7

(OR)

6 a) State and explain compensation theorem. 7 Marks

b) Calculate the change in current of the network given below using compensation theorem when load resistor changes to 10Ω. 7 Marks



UNIT-IV

7 a) Explain how the power factor of a three phase load can be determined by two wattmeter method. 6 Marks

b) Find the line currents in the unbalanced three-phase circuit of Fig. 8 and the real power absorbed by the load. 8 Marks

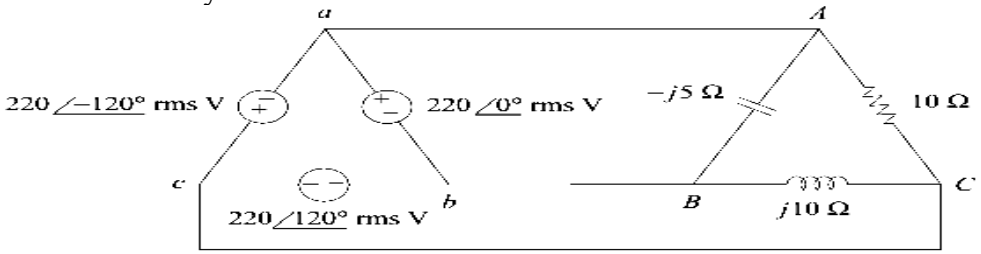


Fig. 8

(OR)

8 Three identical coil having impedance of (17.32 + j10) Ω each are connected in star across a 3-phase, 50 Hz, 400V supply. Find: 14 Marks

i) The total power supplied.
ii) Power factor of the load.
iii) If same coils are now connected in delta, calculate the total power taken by the load. Comment on result.

UNIT-V

9 a) For the coupled circuit shown in fig. 9 find the input impedance at the terminals **ab**. 6 Marks

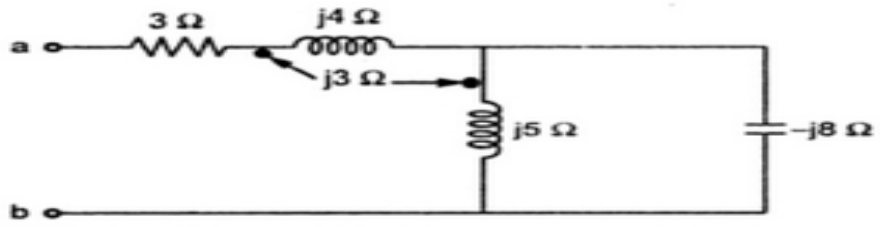


Fig. 9

b) Determine the mesh currents I_1 and I_2 in the circuit of Fig. 10 8 Marks

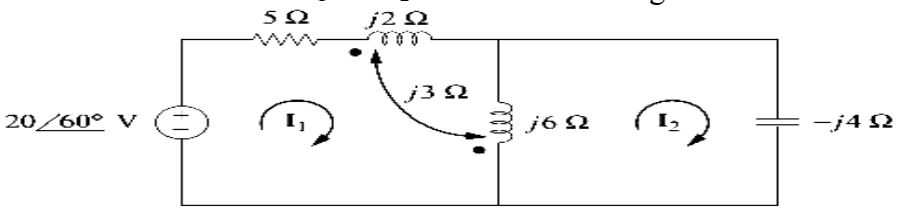


Fig. 10

(OR)

10 a) Determine the voltage V_0 in the circuit of Fig. 11 7 Marks

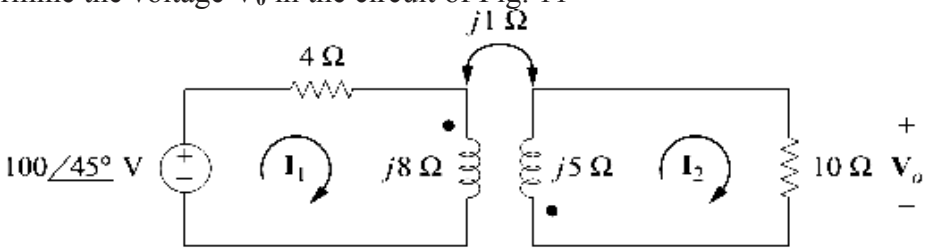


Fig. 11

b) For the circuit in Fig. 12, determine the coupling coefficient and the energy stored in the coupled inductors at t =1.5s. 7 Marks

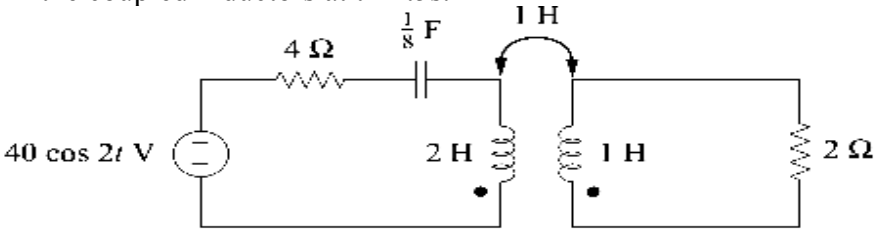


Fig. 12

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations February – 2021

NETWORK ANALYSIS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

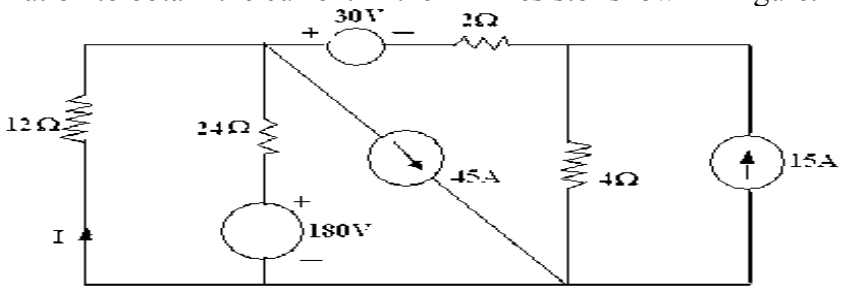
Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Write short notes on source transformation. 7 Marks

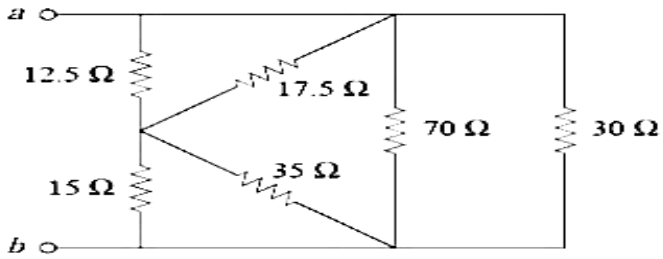
b) Reduce the network to a single loop network by successive source transformation to obtain the current in the 12 Ωresistor shown in figure. 7 Marks



(OR)

2 a) State ohm's law and give its applicability to electrical network and explain convention current direction and voltage across an element. 7 Marks

b) Determine the equivalent resistance between the points **ab** in the circuit shown in figure. 7 Marks



UNIT-II

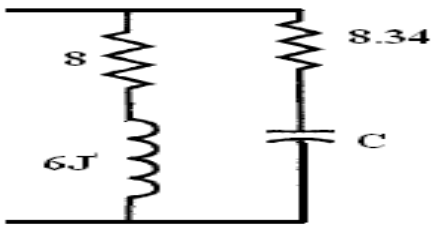
3 a) Explain the concept of active, reactive and apparent power and draw the power triangle. 7 Marks

b) In an AC circuit with 500sin100t as source voltage, connected across series combination of resistance and capacitance of 10Ω and 10F respectively. Calculate the source current flowing through the circuit. Also construct impedance and power triangles. 7 Marks

(OR)

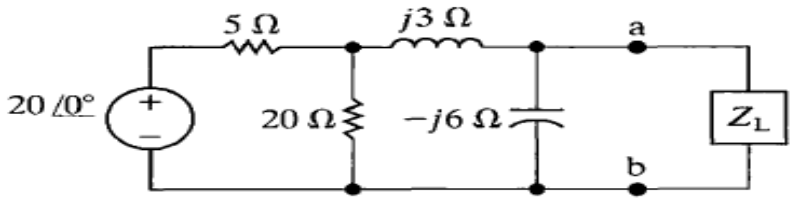
4 a) Define cut-off frequencies and bandwidth. Derive the expressions for cut-off frequencies and bandwidth of series RLC circuit. 7 Marks

b) Design the capacitance C, which results in resonance at 5000 rad/sec for the circuit shown in figure. 7 Marks



UNIT-III

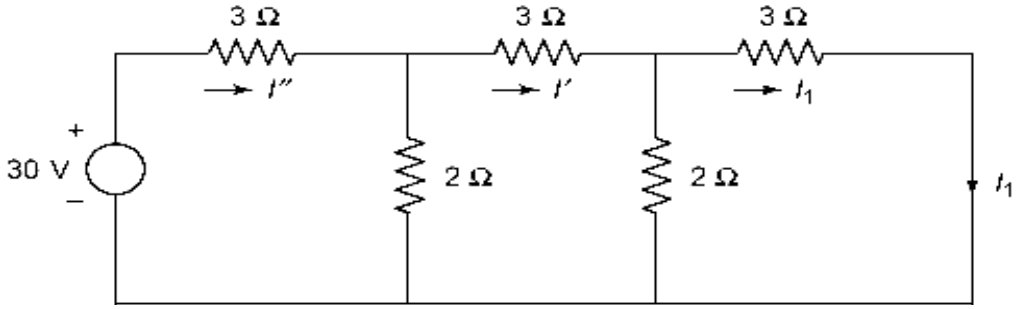
5 For the circuit shown in figure, determine the impedance Z_L that results in maximum average power transfer to Z_L. Also find the maximum power transferred. 14 Marks



(OR)

6 a) State and explain Tellegen's theorem. 7 Marks

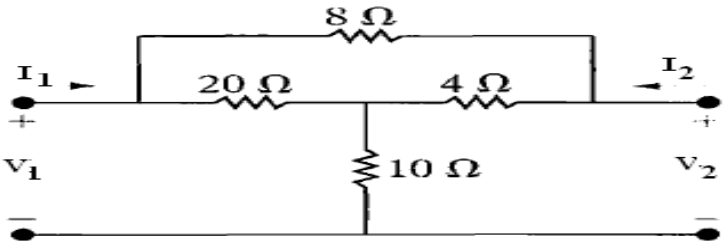
b) Verify reciprocity theorem for the circuit shown in below figure. 7 Marks



UNIT-IV

7 a) Obtain the relation between hybrid and ABCD parameters. 7 Marks

b) Find the y- Parameters for the circuit shown in the figure 7 Marks



(OR)

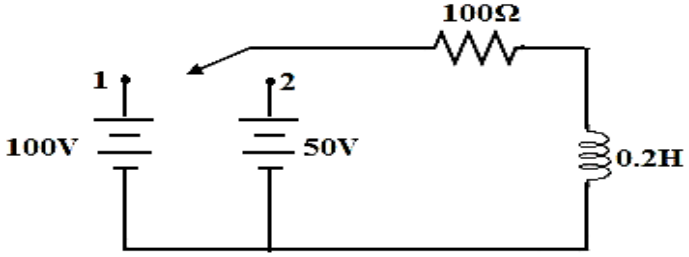
8 a) Define reciprocity and symmetry for a generalized two port network and derive the conditions for reciprocity and symmetry in terms of ABCD parameters. 7 Marks

b) Z-parameters for a two port network are given as Z_{11}=25, Z_{12}=Z_{21}=20, Z_{22}=50. Design an equivalent T-network. 7 Marks

UNIT-V

9 a) What are initial conditions? Explain the procedure to evaluate initial conditions 6 Marks

b) In the circuit shown, theswitchisclosedonposition1at t=0 thereby applying 100V source to the R-L branch, att=500micro seconds, the switch is moved to position 2. Obtain the equations for the current in both intervals. 8 Marks



(OR)

10 A Series RLC circuit with R=100Ω, L=0.1H and C=100μF has a DC voltage of 200 Volts applied to it att=0 through a switch. Determine the transient current. Assume initially the capacitor is charged to a voltage of 10V. 14 Marks

❀ ❀ ❀

CODE No.: 16BT10501 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations February – 2021

PROGRAMMING IN C

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Illustrate Relational, Increment and Decrement, Assignment and Special Operators with example programs. 14 Marks

(OR)

2 a) Why Operator Precedence is necessary? Explain with suitable example. 7 Marks
b) Classify 'C' expressions in detail. 7 Marks

UNIT-II

3 Distinguish between while and do-while statements. Write a C program to determine whether the given no is Armstrong Number or not. 14 Marks

(OR)

4 a) Write a short notes on gets( ) and puts( ) functions with suitable examples. 7 Marks
b) Write a C program to calculate electricity bill using else-if ladder. Read the starting and ending meter readings. The charges are as follows. 7 Marks

No. of Units	Consumed rates in (Rs.) per unit
0-50	1.50
51-100	2.00
101-150	2.50
151-200	2.75
>200	3.00

UNIT-III

5 a) Write short notes on usage of Pre-Processor directives in 'C' programming. 7 Marks
b) Write a 'C' program to find out whether a number is Perfect or not using Functions. 7 Marks

(OR)

6 a) How 1-Dimesional and 2-Dimensional arrays will be Passed to functions? Explain with suitable examples. 7 Marks
b) Write a 'C' program to find Transpose of a Given Matrix using Functions. 7 Marks

UNIT-IV

7 Demonstrate Dynamic Memory Allocation functions with syntax. 14 Marks

(OR)

8 a) What is Pointer to Pointer? Explain with example. 7 Marks
b) Write a program using Functions and Pointers to accept a given amount in Figures and display it in Words. (Ex:input:123 output>One Hundred and Twenty Three Rupees) 7 Marks

UNIT-V

9 a) What is the difference between sequential access and Random access of files? 7 Marks
b) Using command line arguments, write a program to copy two files. 7 Marks

(OR)

10 a) Explain in detail about Random Access file functions with suitable examples. 7 Marks
b) Explain about fread( ) and fwrite( ) functions with its syntax. 7 Marks

❀ ❀ ❀

CODE No.: 16BT1BS01 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations January – 2022

ENGINEERING CHEMISTY

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Four samples of water are collected at Naravari palli (**NP**), Pullaiahgari palli (**PP**), Kunchivari Palli (**KP**) and the other at Bandara Palli (**BP**). 100 ml of the each water sample collected at NP, PP, KP, and BP requires 28, 26, 20, 18 mL of EDTA solution on titrations respectively. 100ml of standard hard water (0.28 g of $CaCO_3$ per liter) requires 24ml of EDTA solution on titration. Calculate and compare the degree of hardness and Write the chemical reactions involved in titration.	8 Marks
	b)	Discuss the effects of fuorides in water on human Health and Nalgonda technique for defluoridation of water.	6 Marks

(OR)

2	a)	Rishika want to investigate the reason for unpredicted explosion of home boiler. After explosion the following deposits were found on analysis of boiler pieces. $CaSO_4$, $CaSiO_3$, $MgSiO_3$, Fe_2O_3, $Mg(OH)_2$, Na_2FeO_2, $CaCO_3$. Looking at the data Rishika Discussed about how boiler has suffered before explosion predicting the impurities present in water. Can you write the report discussing the attributes for explosion?	8 Marks
	b)	Write the chemistry of estimation of water hardness by EDTA method.	6 Marks

UNIT-II

3	a)	Discuss the preparation, properties and uses of PTFE and PMMA.	8 Marks
	b)	Explain Engineering applications of conducting polymers.	6 Marks

(OR)

4	a)	Explain the types of conducting polymer with suitable examples.	7 Marks
	b)	Explain the conduction mechanism of polyaniline.	7 Marks

UNIT-III

5	a)	Discuss the synthesis of Biodiesel by Trans esterification method.	7 Marks
	b)	Enumerate advantages, disadvantages and important applications of Biodiesel.	7 Marks

(OR)

6	a)	Write informative notes on recent trends in NANO TECHNOLOGY and future trends of GREEN CHEMISTRY.	10 Marks
	b)	Illustrate disadvantages of Nanomaterials.	4 Marks

UNIT-IV

7	a)	Explain the construction and working of bio-fuel cell with a rough diagram. Mention its two applications.	10 Marks
	b)	Generation of electricity by fuel cell is eco-friendly-give your comments.	4 Marks

(OR)

8	a)	Calculate the standard e.m.f. of the H_2-O_2 fuel cell, given E^0 values as -0.40V and 0.83V for the hydrogen and oxygen half cells respectively	5 Marks
	b)	Identify the type of battery that is truly the power behind everyday life. They start and power vehicles, back up uninterruptible operations like hospitals, railroad signals, air traffic controls, and help electric utilities shift loads among grids. Explain the chemistry with neat diagram.	9 Marks

UNIT-V

9	a)	Analyze the possible means of rendering a metal cathodic to protect it from corrosion.	7 Marks
	b)	What is metallic corrosion? Pin holes on tin coated iron are more prone to corrosion of iron than those on zinc coated iron. Why?	7 Marks

(OR)

10	a)	How will you assess the situation and identify the type of corrosion from the physical manifestation of the corroded components / parts?	8 Marks
	b)	Discuss the functions of lubricants with suitable examples.	6 Marks

CODE No.: 16BT1BS02 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

ENGINEERING PHYSICS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain briefly the three processes involved in the LASER action with suitable diagrams.	10 Marks
	b)	List six applications of optical fibers.	4 Marks
		(OR)	
2	a)	Illustrate how a LASER is different from other light sources.	4 Marks
	b)	Explain the various types of optical fibers.	10 Marks

UNIT-II

3	a)	What are matter waves? Explain their properties and derive the expression for de-Broglie wavelength.	9 Marks
	b)	Explain the origin of energy bands in solids.	5 Marks
		(OR)	
4	a)	Basing on the energy band structure classify solids into conductors, semiconductors and insulators with neat diagrams.	9 Marks
	b)	What is the physical significance of the wave function?	5 Marks

UNIT-III

5	a)	Define the following terms as they pertain to semi conducting materials: intrinsic, extrinsic, compound, elemental and give an example for each.	4 Marks
	b)	In your own words, explain how donor impurities in semiconductors give raise to free electrons in numbers in excess of those generated by valence band-conduction band excitations.	6 Marks
	c)	Germanium to which $\mathbf{10^{24}/m^3}$ **'P'** atoms have been added in an extrinsic semiconductor at room temperature, and virtually all the **'P'** atoms may be thought of as being ionized (i.e. one charge carrier exists for each **'P'** atom). (i) Is this material n – type or p – type? (ii) Calculate the electrical conductivity of this material, assuming electron and hole mobilities of 0.1 and $0.05\mathbf{m^2/V\text{-}s}$ respectively.	4 Marks
		(OR)	
6	a)	Derive an expression for the intrinsic carrier concentration of a semiconductor.	7 Marks
	b)	Describe the drift and diffusion currents in a semiconductor.	4 Marks
	c)	The intrinsic carrier concentration at room temperature of Ge is $2.37 \times 10^{19}/m^3$. If the electron and hole mobilities are 0.38 and 0.18 m^2/V-s respectively, calculate the resistivity.	3 Marks

UNIT-IV

7	a)	Mention the properties of superconductors. Give some applications of superconductors.	7 Marks
	b)	Show that a superconductor in its superconducting state acts as a perfect diamagnetic material.	7 Marks
		(OR)	

8	a)	Define the terms reverberation, reverberation time and absorption coefficient of a material.	6 Marks
	b)	Derive Sabine's formula for reverberation time.	8 Marks

UNIT-V

9	a)	Derive an expression for the interplanar spacing in case of a cubic structure.	8 Marks
	b)	Discuss the physical, chemical and thermal properties of nano materials.	6 Marks

(OR)

10	a)	Describe any one top down method by which nano materials are fabricated.	10 Marks
	b)	List the significances of miller indices.	4 Marks

CODE No.: 16BT1BS03 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations January – 2022

MATRICES AND NUMERICAL METHODS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Define the rank of a matrix and find the rank of the following matrix. 7 Marks

$$A = \begin{bmatrix} 2 & 1 & 3 & 5 \\ 4 & 2 & 1 & 3 \\ 8 & 4 & 7 & 3 \\ 8 & 4 & -3 & -1 \end{bmatrix}$$

b) Discuss for what values of λ and μ, the simultaneous equations $x + y + z = 6$; $x + 2y + 3z = 10$; $x + 2y + \lambda z = \mu$ have: 7 Marks
i) no solution. ii) a unique solution. iii) an infinite number of solutions.

(OR)

2 a) For the matrix $A=\begin{bmatrix} 1 & 2 & -3 \\ 0 & 3 & 2 \\ 0 & 0 & -2 \end{bmatrix}$, estimate the Eigen values of $3A^3+5A^2-6A+2I$. 7 Marks

b) Find the inverse of the matrix A by applying elementary row operations. 7 Marks

$$A=\begin{bmatrix} 1 & 2 & 3 \\ 2 & -1 & 4 \\ 3 & 1 & -1 \end{bmatrix}$$

UNIT-II

3 a) Applying bisection method, find the real root of $x \log_{10} x = 1.2$ correct to five decimal places. 7 Marks

b) The temperature T(in ^{o}c) and length L (in mm) of a heated rod are given below. 7 Marks
If $L= a_0+a_1T$, estimate the best values for a_0 and a_1.

T	20	30	40	50	60	70
L	800.3	800.4	800.6	800.7	800.9	801.0

(OR)

4 a) Evaluate a real root of the equation $xe^x - \cos x = 0$, using the Newton-Raphson method. 7 Marks

b) By the method of least squares, evaluate a straight line that best fits the following data: 7 Marks

x	1	2	3	4	5
y	14	27	40	55	68

UNIT-III

5 a) The following table gives the viscosity of a lubricant as a function of temperature 7 Marks

Temperature ^{0}C	100	120	150	170
Viscosity	10.2	7.9	5.1	4.4

Using Lagrange's formula, find the viscosity of the lubricant at a temperature 130ºC.

b) Develop the relations between the difference operators. 7 Marks

i) $E = e^{hD}$ (D is the differential operator). ii) $(1+\Delta)(1-\nabla) = 1$

(OR)

6 a) State appropriate interpolation formula which is to be used to calculate the value of y when x=1.75 from the following data and hence estimate the value of y(1.75). 7 Marks

b) i) Establish a relation between the difference operators E and ∇. 3 Marks

ii) Develop the relation between forward and back ward difference operators. 4 Marks

UNIT-IV

7 a) The following table gives the angular displacements θ(radians) at different intervals of time t (seconds): 7 Marks

t	0	0.02	0.04	0.06	0.08	0.10	0.12
θ	0.052	0.105	0.168	0.242	0.327	0.408	0.489

Calculate the angular velocity at t= 0.12 seconds.

b) Given that, 7 Marks

x:	4.0	4.2	4.4	4.6	4.8	5.0	5.2
logx:	1.3863	1.4351	1.4816	1.5261	1.5686	1.6094	1.6484

Evaluate $\int_4^{5.2} \log x \, dx$ by Simpson's 1/3 rule.

(OR)

8 a) Given that: 7 Marks

x	1.0	1.1	1.2	1.3	1.4	1.5	1.6
y	7.989	8.403	8.781	9.129	9.451	9.750	10.031

Estimate the value of dy/dx at x = 1.1.

b) The following table gives the velocity V of a particle at a distance S from a point on its path. 7 Marks

S(feets)	0	10	20	30	40	50	60
V(feets/sec)	47	58	64	65	61	52	38

Estimate the time taken by the particle to travel 60 feet using Simpson's 1/3 rd rule.

UNIT-V

9 a) Employ Taylor's method to obtain approximate value of y at x = 0.2 for the differential equation $\frac{dy}{dx} = 2y + 3e^x, y(0) = 0$. 7 Marks

b) Use the Euler algorithm with a step size h=0.5, find an approximate solution of the linear first order initial value problem $\frac{dy}{dx} = \sin x - y$, $y(0) = 1$ in the interval $0 \le x \le 3$. 7 Marks

(OR)

10 a) Tabulate y(0.1), y(0.2) and y(0.3) using Taylor's series method given that $\frac{dy}{dx} = y^2 + x$ and y(0)=1. 7 Marks

b) Apply Euler's method, solve for y at x=0.1 from $\frac{dy}{dx} = x + y + xy$ with initial condition y=1 at x=0, taking h=0.025. 7 Marks

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

MULTIVARIABLE CALCULUS AND DIFFERENTIAL EQUATIONS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Identify the order and degree and determine the solution of the differential equation $\frac{dy}{dx} + \frac{y}{x\log x} = \frac{\sin 2x}{\log x}$. 7 Marks

b) Apply differentiation and Obtain the orthogonal trajectories of the family of curves $x^2 + y^2 = a^2$. 7 Marks

(OR)

2 a) Determine the solution of the differential equation. 7 Marks
$\frac{dy}{dx} + 2y = e^x + x$, given $y = 1$, when $x = 0$.

b) Verify the system of parabolas $y^2 = 4a(x + a)$ is self orthogonal. 7 Marks

UNIT-II

3 a) Determine the solution of $(D^2 + 4D + 3)y = e^{e^x}$. 7 Marks

b) The charge $q(t)$ on the capacitor is given by the differential equation $10\frac{d^2q}{dt^2} + 120\frac{dq}{dt} + 1000q = 17\sin 2t$. At time zero, the current is zero and the charge on the capacitor is $\frac{1}{2000}$ coloumbs. Determine the charge on the capacitor for $t > 0$. 7 Marks

(OR)

4 a) Obtain the solution of $(D^2 - 3D + 2)y = \cos 3x$. 7 Marks

b) An uncharged condenser of capacity C is charged by applying an e.m.f $E\sin\left(\frac{t}{\sqrt{LC}}\right)$, through leads of self inductance L and negligible resistance. Determine the charge on one plate at any time t. 7 Marks

UNIT-III

5 a) Examine for continuity at the origin of the function defined by 7 Marks
$f(x,y) = \begin{cases} \frac{x^2}{\sqrt{(x^2 + y^2)}} & x \neq 0, y \neq 0; \\ 0; x = 0. y = 0 \end{cases}$

b) Examine the function for extreme values, where the function $f(x,y) = x^4 + y^4 - 2x^2 + 4xy - 2y^2 \quad (x > 0, y > 0)$. 7 Marks

(OR)

6 a) If $u = f(y-z, z-x, x-y)$ then find the value of $\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + \frac{\partial u}{\partial z}$. 7 Marks

b) Show that the rectangular solid of maximum volume that can be inscribed in a sphere is a cube. 7 Marks

UNIT-IV

7 a) Evaluate the length of the arc of the parabola $x^2 = 4ay$ measured from the vertex to one extremity of the latus-rectum. 7 Marks

b) Evaluate the surface of the solid formed by revolving the cardioid $r = a(1+\cos\theta)$ about the initial line. 7 Marks

(OR)

8 a) Find the surface area of the solid revolution of the curve $r = 2a\cos\theta$ about the initial line. 7 Marks

b) Evaluate the double integral $\int_0^5 \int_0^{x^2} x(x^2+y^2)dxdy$. 7 Marks

UNIT-V

9 a) Evaluate unit normal vector to the surface $x^3 + y^3 + 3xyz = 3$ at the point (1, 2, -1). 7 Marks

b) Evaluate $\oint_C F.dR$, If $F = 3xyi - y^2 j$, and c is the curve in the XY-plane $y = 2x^2$ from (0,0) to (1,2). 7 Marks

(OR)

10 a) Evaluate divergence of the flux F at the point (1, 2, 3) given $F = grad\left[x^3y + y^3z + z^3x - x^2y^2z^2\right]$. 7 Marks

b) Compute the work done in the moving a particle in the force field $F = 3x^2i + (2xz - y)j + zk$, along the curve define by $x^2 = 4ay, 3x^3 = 8z$ from x=0 to x=2. 7 Marks

CODE No.: 16BT1HS01 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

TECHNICAL ENGLISH

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Discuss the different levels of communication in detail. 14 Marks

(OR)

2 Define barriers to Communication. Give two example of each of the following: 14 Marks
- i) Intrapersonal barriers.
- ii) Organisation barriers.
- iii) Interpersonal barriers.

UNIT-II

3 List some of the common external and personal barriers to listening. How are they similar / dissimilar to the general barriers to communication? 14 Marks

(OR)

4 What do you understand by the following terms? 14 Marks
- i) Appreciative Listening. ii) Empathetic Listening.
- iii) Comprehensive Listening. iv) Critical Reasoning.

UNIT-III

5 Explore the various types of speaking with appropriate guidelines. 14 Marks

(OR)

6 Suggest guidelines to achieve confidence. 14 Marks

UNIT-IV

7 Explain the following in about 150 words each: 14 Marks
- i) Study skills. ii) Inductive Logic.
- iii) Lexical meaning. iv) SQ3R.

(OR)

8 Discuss in detail the various purposes and methods of reading that are employed by readers. 14 Marks

UNIT-V

9 How does language help in technical writing? Explain which the help of suitable examples. 14 Marks

(OR)

10 Explain the techniques for good technical writing. 14 Marks

❀ ❀ ❀

CODE No.: 16BT10201 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations January – 2022

ELECTRICAL CIRCUITS

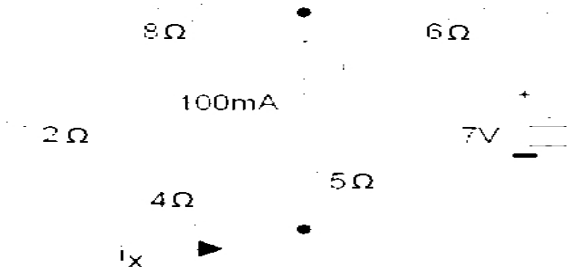
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

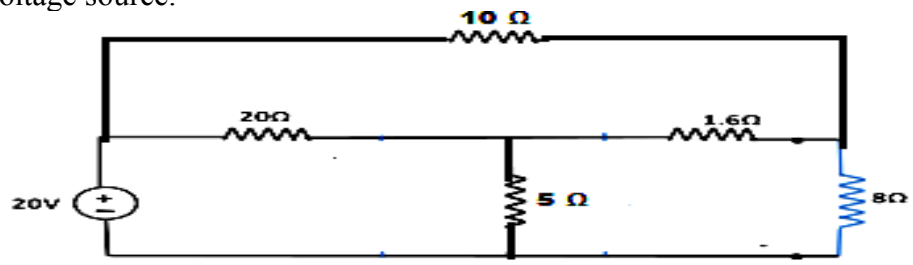
UNIT-I

1 a) Solve the current i_x passing through the 4Ω resistor using Mesh Analysis for the circuit shown in Figure. 7 Marks



Figure

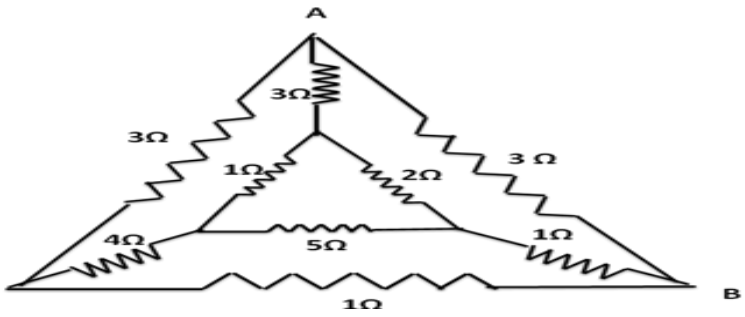
b) Compute the equivalent resistance across voltage source using star/delta transformation for the circuit shown in Figure. Also compute current delivered by voltage source. 7 Marks



Figure

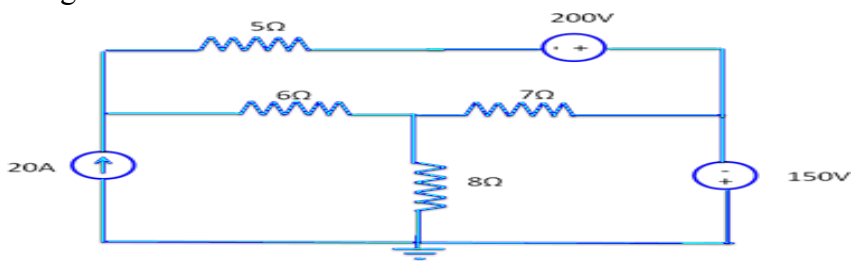
(OR)

2 a) Find the equivalent resistance across AB for the network shown in Figure. 7 Marks



Figure

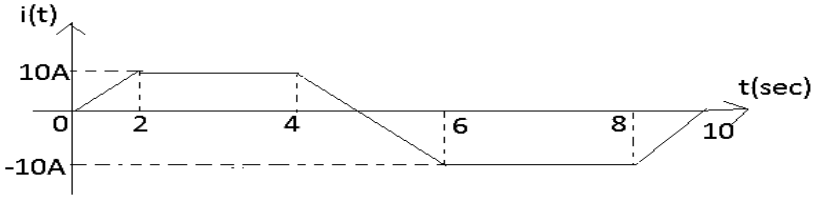
b) Find the current flowing through 8Ω by using Mesh analysis for the circuit shown in Figure. 7 Marks



Figure

UNIT-II

3 a) Compute the effective value, average value, form factor and peak factor of the waveform shown in Figure. 7 Marks

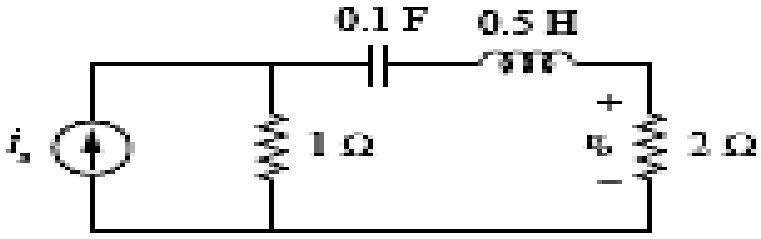


Figure

b) Define current locus. Explain the procedure to draw the current locus diagram for series RL circuit. 7 Marks

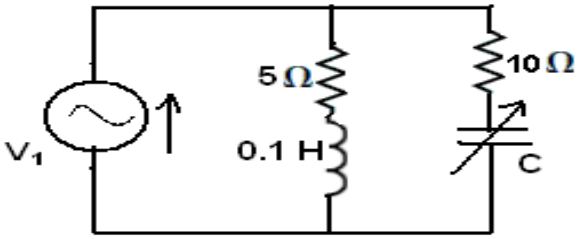
(OR)

4 a) For the circuit shown in Figure, If the voltage across 2 Ω resistor $V_0(t)$=-5 cos 2t, Compute the source current $\mathbf{i_s}$. 7 Marks



Figure

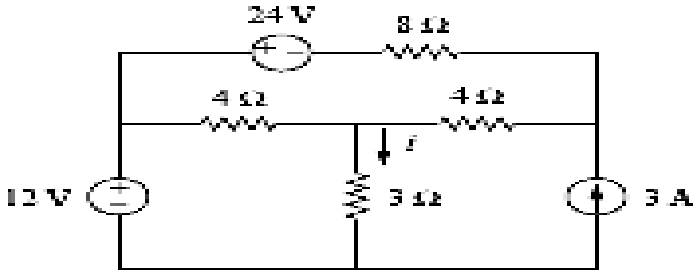
b) In a given network shown in Figure, obtain its resonance at 100 kHz. Determine capacitance value. If V_1 = 200 ∠30^0 V, compute current passing through inductor and capacitor. 7 Marks



Figure

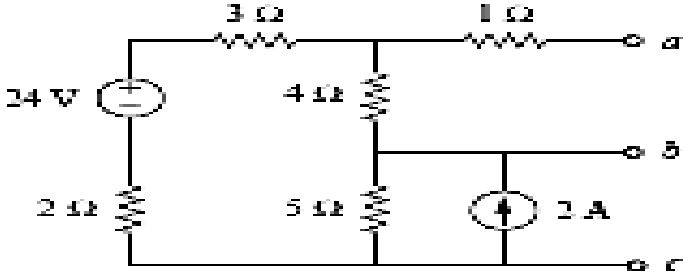
UNIT-III

5 a) For the circuit shown in Figure, use the superposition theorem to find **i.** 7 Marks



Figure

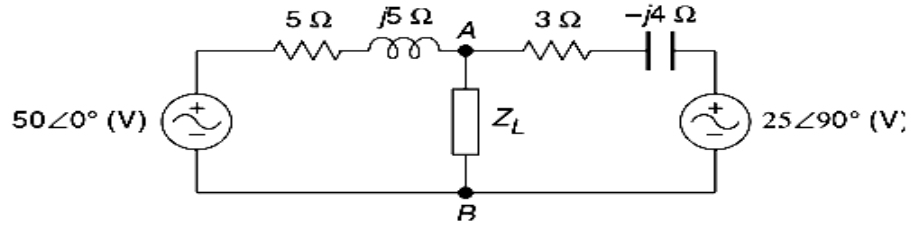
b) For the circuit shown in Figure, obtain the Thevenin's equivalent as seen from terminals. (i) a-b and (ii) b-c. 7 Marks



Figure

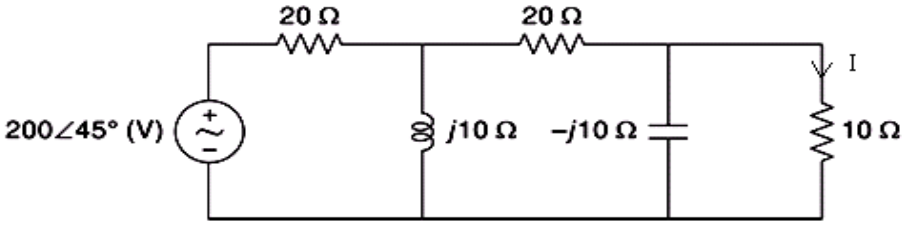
(OR)

6 a) For the circuit shown in Figure, compute the equivalent impedance for which Z_L will receive the maximum power. What is the maximum power delivered to load? 7 Marks



Figure

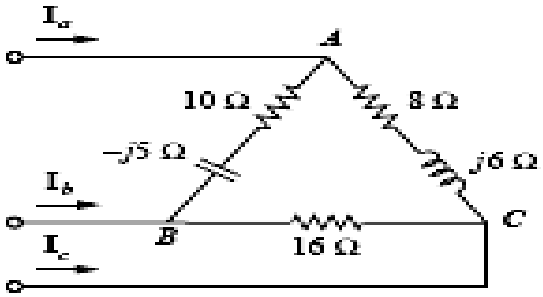
b) Verify the reciprocity theorem for the ladder network shown in Figure. 7 Marks



Figure

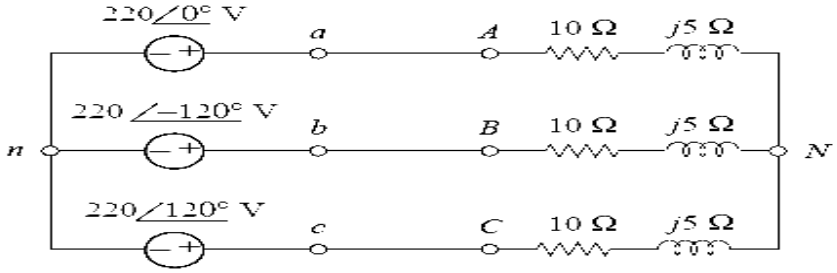
UNIT-IV

7 a) The unbalanced Δ - load shown in Figure is supplying by balanced line to line voltage of 240V in positive sequence. Find the line currents. Take V_{ab} as reference. 7 Marks



Figure

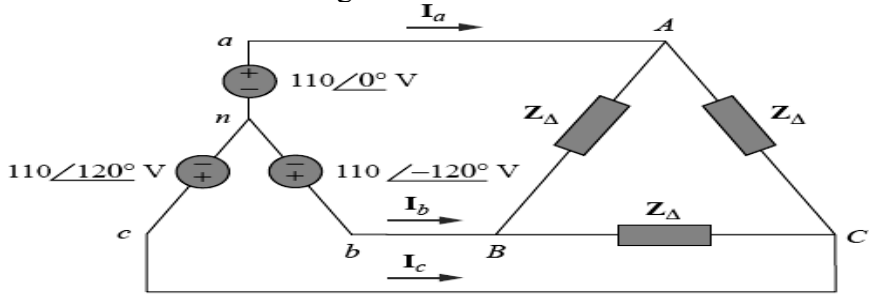
b) For the Y-Y circuit shown in Figure, find the line currents, the line voltages, and the load voltages. 7 Marks



Figure

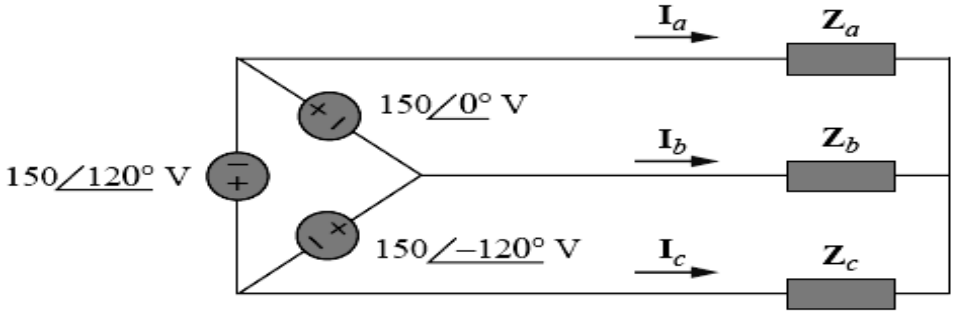
(OR)

8 a) Solve for the line currents in the Y connected source feeding Δ connected balanced circuit shown in Figure. Take $Z_\Delta = 60\angle 45^0$. 7 Marks



Figure

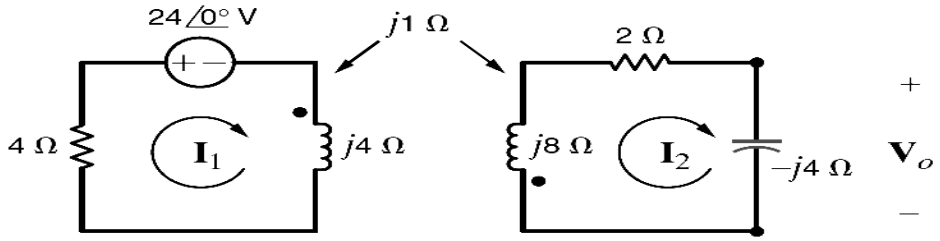
b) For the circuit in shown in Figure, $Z_a = 6 - j8\ \Omega$, $Z_b = 12 + j9\ \Omega$, and $Z_c = 15\ \Omega$. Find the line currents I_a , I_b, and I_c. Compute the active, reactive and apparent power delivered to load. 7 Marks



Figure

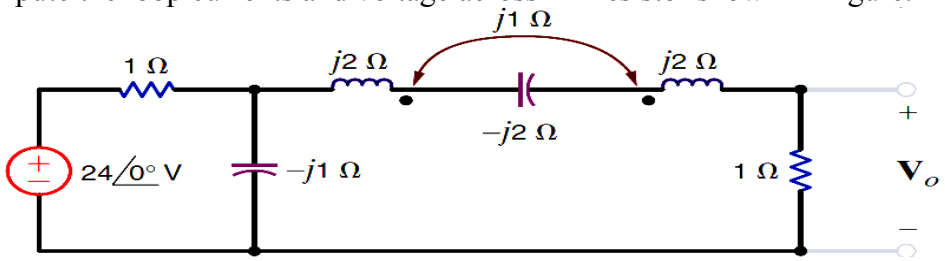
UNIT-V

9 a) Find the current I_1 and I_2 and the output V_0 in the network shown in Figure. 7 Marks



Figure

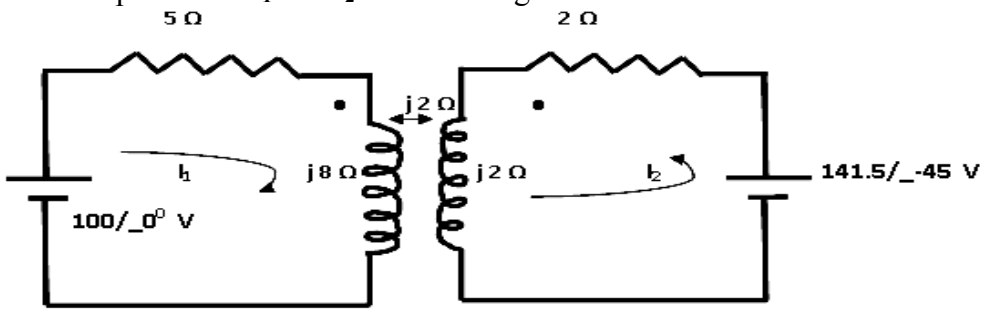
b) Compute the loop currents and voltage across 1Ω resistor shown in Figure. 7 Marks



Figure

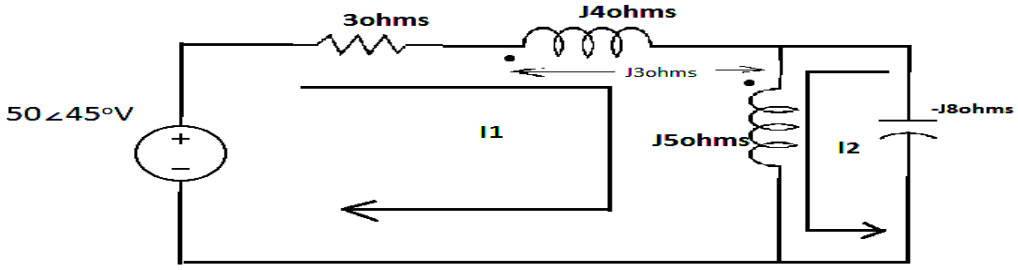
(OR)

10 a) Find the loop currents I_1 and I_2 shown in Figure. 7 Marks



Figure

b) In the circuit of Figure, find the voltage across the capacitance with the polarity shown. 7 Marks



Figure

❀ ❀ ❀

CODE No.: 16BT10501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations January – 2022

PROGRAMMING IN C

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Write a menu driven program to compute electricity bill taking different categories of users for different slabs.	14 Marks
		(OR)	
2		Describe the logical not (logical negation) operator. What is its purpose. Within which precedence group is it included? How many operands does it require? What is it's associatively?	14 Marks

UNIT-II

3	a)	Write a program that illustrates the use of the precision feature with floating-point numbers.	8 Marks
	b)	Compare and contrast break and continue statements with relevant examples.	6 Marks
		(OR)	
4	a)	Design an algorithm to check a given integer is prime or not.	7 Marks
	b)	Explain in detail about do-while statement with suitable example.	7 Marks

UNIT-III

5	a)	What relationship must exist between the data type appearing at the beginning of the first line of the function definition and the value returned by the return statement?	7 Marks
	b)	What is the difference between single dimensional arrays and double dimensional arrays explain with examples.	7 Marks
		(OR)	
6	a)	How is a static variable defined in a single-file program? How is a static variable initialized? Compare with automatic variables.	7 Marks
	b)	Program for addition of two given matrices using functions to read, display and add the matrices.	7 Marks

UNIT-IV

7	a)	Develop a program to read two strings **str1** and **str2** and then find out whether the string **str2** is the substring of **str1**or not.	7 Marks
	b)	Develop a program to read two strings **str1** and **str2** from the user and then find whether the given two strings are equal or not without using **strength** library functions.	7 Marks
		(OR)	
8	a)	Develop a program to read a line of text and a string **str1** and then replace each occurrence of **str1** with its reverse string in the given line of text.	7 Marks
	b)	Develop a program to read a string and a character and then insert the character into a specified position of the given string.	7 Marks

UNIT-V

9	a)	Suppose a pointer variable points to a structure that contains another structure as a member. How can a member of the embedded structure be accessed?	7 Marks
	b)	Write a program to read student data consisting of Id.No, Name and marks in six subjects from the keyboard, write it to a file called INPUT, again read the same data from the file INPUT, and find the total and percentage marks of each student. Display the output in tabular form.	7 Marks

(OR)

10	a)	How can an entire structure be passed to a function? Describe fully, both for older and newer versions of C.	7 Marks
	b)	What are the three steps followed while accessing a file? Write a program to convert the case of alphabets in a text file. Upper case letters should be converted to lower case and vice versa.	7 Marks

CODE No.: 16BT1BS01 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations June – 2022

ENGINEERING CHEMISTRY

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Explain the Ion-Exchange process for softening of water with the reactions involved and mention the advantages, disadvantages of this process.	14 Marks
		(OR)	
2	a)	Define hardness of water and give various units of hardness, interrelate various units with ppm.	7 Marks
	b)	Give reasoning for the following: i) Why does hard water consume lot of soap? ii) Calgon treatment prevents scale formation in boilers. Give reason.	7 Marks

UNIT-II

3		Define Engineering plastics. Discuss their general properties and applications	14 Marks
		(OR)	
4		Explain in brief about the types of composite materials and mention their applications.	14 Marks

UNIT-III

5		Design the synthesis of nanomaterials by Sol-Gel method with a neat sketch.	14 Marks
		(OR)	
6		Why the properties of nanomaterials differ significantly from bulk materials? Explain the properties of nanomaterials with examples.	14 Marks

UNIT-IV

7		Define EMF of an electrochemical cell. Discuss the construction and representation of electrochemical cell.	14 Marks
		(OR)	
8	a)	How does fuel cell differ from battery? Mention the advantages of fuel cells.	7 Marks
	b)	Write the classification of batteries with examples.	7 Marks

UNIT-V

9	a)	Explain the mechanism of thick film lubrication.	7 Marks
	b)	Discuss the importance of viscosity, aniline point and neutralization number.	7 Marks
		(OR)	
10	a)	Define lubricant. Mention the important functions of lubricant.	7 Marks
	b)	Write an explanatory note on any two solid lubricants.	7 Marks

❀ ❀ ❀

CODE No.: 16BT1BS02 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations June – 2022

ENGINEERING PHYSICS

[Electrical and Electronics Engineering, Electronics and Communications Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Classify the optical fibers on the basis of refractive index profile and modes of propagation.	10 Marks
	b)	Mention the applications of optical fibers in various fields.	4 Marks
		(OR)	
2	a)	Draw the block diagram of an optical fiber communication system and explain the function of each block.	9 Marks
	b)	Mention various applications of optical fibers.	5 Marks

UNIT-II

3	a)	Discuss the de-Broglie hypothesis of duality of material particles.	6 Marks
	b)	Formulate time independent Schrodinger's wave equation for a free particle.	8 Marks
		(OR)	
4		Show that the energies of a particle in a infinite potential box are quantized.	14 Marks

UNIT-III

5	a)	Explain direct and indirect band gap semiconductors.	6 Marks
	b)	Write a short note on LED. Calculate the wavelength of radiation emitted by a LED made up of GaAs with band gap of 1.43 eV.	8 Marks
		(OR)	
6		Construct and explain the working mechanism of photo diode and solar cell.	14 Marks

UNIT-IV

7	a)	What is superconductivity? Explain the general properties of superconductors. A superconducting tin has a critical temperature of 3.7 K at zero magnetic field and a critical field of 0.0306 Tesla at 0K. Find the critical field at 2K.	10 Marks
	b)	List various applications of superconductivity.	4 Marks
		(OR)	
8	a)	Elaborate Meissner effect.	7 Marks
	b)	Explain Penetration depth and Flux quantization.	7 Marks

UNIT-V

9	a)	Define Nanomaterial. Explain any five properties of nanomaterials.	8 Marks
	b)	Describe the fabrication of nanomaterials by using ball milling method.	6 Marks
		(OR)	
10	a)	Describe any one method of fabrication of nanomaterials.	7 Marks
	b)	Write few applications of nanomaterials.	7 Marks

❀ ❀ ❀

CODE No.: 16BT1BS03 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations June – 2022

MATRICES AND NUMERICAL METHODS

[Civil Engineering, Mechanical Engineering, Electrical and Electronics Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Determine the non-singular matrices P and Q such that PAQ is in the normal form for A and hence find the rank of the matrix $A=\begin{bmatrix} 1 & 2 & 3 & -2 \\ 2 & -2 & 1 & 3 \\ 3 & 0 & 4 & 1 \end{bmatrix}$ 14 Marks

(OR)

2 a) Find the inverse of the matrix by elementary row operations $\begin{bmatrix} 1 & 1 & 3 \\ 1 & 3 & -3 \\ -2 & -4 & -4 \end{bmatrix}$ 7 Marks

b) Define the terms consistency and inconsistency. Determine whether the following system of equations are consistent. If so solve them. 7 Marks
$x + y + 2z = 9, x - 2y + 2z = 3, 2x - y + z = 3, 3x - 6 + z = 4.$

UNIT-II

3 a) Apply Bisection method to calculate the negative root for the equation $x^3 - 4x + 9 = 0$. 7 Marks

b) Design a recurrence formula for evaluating $\sqrt{N}$ by Newton Raphson's method and hence estimate $\sqrt{41}$ correct to four decimal places. 7 Marks

(OR)

4 a) Design a recurrence formula for the reciprocal of a natural number N byNewton-Raphson's method and hence find the reciprocal of 18. 7 Marks

b) Using method of false position, find an approximate root for the equation $x \log_{10} x = 1.2$ near to 2.5. 7 Marks

UNIT-III

5 a) Construct an interpolating polynomial for the following data using Newton's forward formula. 7 Marks

x	0	1	2	3	4
y	3	6	11	18	27

b) Estimate the value of $y(10)$ from the following data using Lagrange's interpolation formula . 7 Marks

x	5	6	9	11
y	12	13	14	16

(OR)

6 a) Define : 7 Marks

i) Shift operator.

ii) Forward difference operator and obtain the relation between them.

b) Estimate the value of y at $x = 1.5$ applying Newton's forward interpolation formula from the following data (0, 1), (1, 14), (2, 15), (3, 5) , (4, 6). 7 Marks

UNIT-IV

7 a) The Velocities of a Car (running of straight rod) at intervals of 2 minutes are given below 7 Marks

Time in minutes	0	2	4	6	8	10	12
Velocity in km/hr	0	22	30	27	18	7	10

Apply the Simpson's rule to find the distance covered by car in 12 minutes.

b) The following data gives corresponding values of pressure(p) and specific volume(v) of superheated system 7 Marks

v	2	4	6	8	10
p	10.5	42.7	25.3	16.7	13

Evaluate the rate of change of pressure with respect to volume when $\boldsymbol{v} = 2$.

(OR)

8 a) The population of a certain town (as obtained from census data) is shown in the following table 7 Marks

Year	1951	1961	1971	1981	1991
Population (in thousands)	19.96	39.65	58.81	77.21	94.61

Estimate the rate of growth of the population in the year 1981.

b) State Simpson's 1/3 rule and applying it evaluate $\int_0^{\frac{\pi}{2}} \sqrt{\sin\theta}\, d\theta$. 7 Marks

UNIT-V

9 a) Compute y at x = 0.25 by Euler's method given that $y' = 2xy, y(0) = 1$. Compare with exact solution. 7 Marks

b) Write Runge-Kutta formula of fourth order and estimate $y(0)$, given $y' = 3x + \frac{1}{2}y,\ y(0) = 1$ by using it, taking h = 0.1. 7 Marks

(OR)

10 a) Solve numerically $y' = y + e^x,\ y(0) = 0$ for $x = 0.2, 0.4$ by Modified Euler's method. 7 Marks

b) Apply the fourth order R-K method to find $y(0.1)$ and $y(0.2)$, given $y' = xy + + y^2,\ y(0) = 1$. 7 Marks

CODE No.: 16BT1BS04 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations, June 2022

MULTI-VARIABLE CALCULUS AND DIFFERENTIAL EQUATIONS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Write the general form of a first order linear equation, its general solution and hence find the solution of $x\cos x\frac{dy}{dx}+(x\sin x+\cos x)y=1$. 7 Marks

b) Write the general form of first order linear equation in x and its general solution and hence solve the differential equation $(x+y+1)\frac{dy}{dx}=1$. 7 Marks

(OR)

2 a) Evaluate the equation of the curve satisfying the differential equation $(1+x^2)\frac{dy}{dx}+2xy=4x^2$ and passing through origin. 7 Marks

b) Find the solution of the differential equation $(1+y^2)\,dx=(\tan^{-1}y-x)\,dy$. 7 Marks

UNIT-II

3 a) Write the general form of an n^{th} order homogeneous linear equation with constant coefficients and hence solve equation $4y'''+4y''+y'=0$. 7 Marks

b) Solve the differential equation $y''+6y'+9y=0$, $y(0)=-4$ and $y'(0)=14$. 7 Marks

(OR)

4 a) By the technique of finding the particular integrals , find the general solution of the differential equation $(D^2+4D+13)y=2e^{-x}$ 7 Marks

b) Write the general form of a non-homogeneous differential equation of order n and establish a general solution for the differential equation $(D+2)(D-1)^2y=e^{-2x}+2\sinh x$. 7 Marks

UNIT-III

5 a) Evaluate $\lim_{\substack{x\to 1\\ y\to 2}}\frac{2x^2y}{x^2+y^2+1}$. 7 Marks

b) Define continuity of the function f(x, y) at a point (a, b) and analyze the function $f(x,y)=\begin{cases}\frac{2xy}{x^2+y^2}, & (x,y)\neq(0,0)\\ 0 & (x,y)=(0,0)\end{cases}$ for the continuity at origin. 7 Marks

(OR)

6 a) If $f(x,y)=\frac{x-y}{2x+y}$ then show that $\underset{x\to 0}{Lt}\ \underset{y\to 0}{Lt}\ f(x,y) \neq \underset{y\to 0}{Lt}\ \underset{x\to 0}{Lt}\ f(x,y)$. 5 Marks

b) Define continuity of the function f(x, y) and analyze the following function $f(x,y)=\begin{cases}\frac{x^2}{\sqrt{x^2+y^2}} & for\quad x\neq 0\ ,y\neq 0\end{cases}$ for its continuity at origin by appropriately defining the function at origin. 9 Marks

UNIT-IV

7 a) Prove that the length of the arc of the parabola $y^2 = 4ax$ cut off by its latus-rectum is $2a(\sqrt{2} + \log(1+\sqrt{2}))$. 7 Marks

b) Find the surface area generated by the revolution of an arc of the catenary $y = c\cosh\frac{x}{c}$ about the x – axis. 7 Marks

(OR)

8 a) Find the perimeter of the cardioid $r = a(1 - \cos\theta)$. 7 Marks

b) Change the order of integration and evaluate $\int_0^b \int_0^{\frac{a\sqrt{b^2-y^2}}{b}} xydxdy$. 7 Marks

UNIT-V

9 a) Define gradient of a scalar point function and show that $\nabla[f(r)] = \frac{f'(r)}{r}\bar{r}$ where $\bar{r} = x\bar{i} + y\bar{j} + z\bar{k}$. 6 Marks

b) Define directional derivative and find the directional derivative of $f = x^2 - y^2 + 2z^2$ at the point p = (1, 2, 3) in the direction of the line PQ, where Q= (5, 0, 4). 8 Marks

(OR)

10 a) Find the directional derivative of $xyz^2 + xz$ at (1,1,1) in a direction of the normal to the surface $3xy^2 + y = z$ at (0,1,1). 7 Marks

b) Find the angle between the normal to the surface $x^2 = yz$ at the points (1,1,1) and (2, 4, 1). 7 Marks

❀ ❀ ❀

CODE No.: 16BT10501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations June – 2022

PROGRAMMING IN C

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Describe two different ways to utilize the increment and decrement operators. Explain with suitable examples.	7 Marks
	b)	Define unary operators. How many operands are associated with unary operators explain with examples?	7 Marks
		(OR)	
2		What is an operator? Describe the different types of operator that are included wit in the 'C' language with the example for each.	14 Marks

UNIT-II

3	a)	Compare and Contrast Pre-Test and Post-Test Loops with examples.	7 Marks
	b)	Write short notes on Break, Continue and Go to statements.	7 Marks
		(OR)	
4	a)	Illustrate Entry-Controlled and Exit-Controlled Loops.	7 Marks
	b)	Write a 'C' Program that prints Mathematical Table of a given number.	7 Marks

UNIT-III

5	a)	Describe briefly about various Storage Classes available in 'C'.	7 Marks
	b)	Write a 'C' Program to calculate GCD of given numbers using Recursion.	7 Marks
		(OR)	
6	a)	Differentiate Recursion with Iteration.	7 Marks
	b)	Write a 'C' Program that uses a Function to copy One String into another.	7 Marks

UNIT-IV

7	a)	Define String. Explain String input and output functions with syntax.	7 Marks
	b)	Write a 'C' Program to check whether the given string is Palindrome or not.	7 Marks
		(OR)	
8	a)	Compare array of Characters and Pointer to characters.	7 Marks
	b)	Explain how to pass a Pointer array to a function.	7 Marks

UNIT-V

9	a)	Explain the concept of Structures and Pointers with suitable examples.	7 Marks
	b)	Write a Program which will read students Name, Roll number and Marks in 3 Subjects. Calculate its sum and average and print them on output screen. (Note: Use Structure)	7 Marks
		(OR)	
10	a)	What is Self-Referential Structure? Explain.	7 Marks
	b)	Write a 'C' Program to determine the frequency of letters in a given string. (Note: Use Structure to represent words).	7 Marks

❀ ❀ ❀

CODE No.: 19BT1BS01 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations August – 2021

DIFFERENTIAL EQUATIONS AND MULTIVARAIBLE CALCULUS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Solve the differential equation $\frac{d^2y}{dx^2} + \frac{dy}{dx} + y = \left(1 - e^x\right)^2$.	6 Marks	L3	CO1	PO1 PO2
	b)	Solve the differential equation $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = xe^x \sin x$.	6 Marks	L3	CO1	PO1 PO2
		(OR)				
2.	a)	Using the method of variation of parameters, solve $y'' - 2y' + y = e^x \log x$.	6 Marks	L3	CO1	PO1 PO2
	b)	Change the differential equation $x^2\frac{d^2y}{dx^2} - x\frac{dy}{dx} + y = \log x$ in to linear equation with constant coefficients and find its general solution.	6 Marks	L2	CO1	PO1 PO2

UNIT-II

3.	a)	Construct the partial differential equation by eliminating arbitrary function f from the relation $f\left(x^2 + y^2, z - xy\right) = 0$.	6 Marks	L3	CO1	PO1
	b)	Find the complete solution of the partial differential equation $z^2\left(p^2 + q^2\right) = x^2 + y^2$.	6 Marks	L1	CO1	PO1 PO2
		(OR)				
4.	a)	Solve the partial differential equation $r - 4s + 4t = e^{2x+y}$.	6 Marks	L3	CO1	PO1 PO2
	b)	Applying the method of separation of variables to solve $\frac{\partial u}{\partial x} = 2\frac{\partial u}{\partial t} + u$.	6 Marks	L3	CO1	PO1 PO2

UNIT-III

5.	a)	Determine $\frac{du}{dx}$ *when* $u = x\log xy$ *and* $x^3 + y^3 + 3xy = 1$.	6 Marks	L3	CO2	PO1
	b)	Define Jacobian for two variables and find the Jacobian of the variables $u = \frac{x+y}{1-xy}$ *and* $v \tan^{-1}x + \tan^{-1}y$.	6 Marks	L1	CO2	PO1
		(OR)				
6.	a)	Divide the number 24 into three parts such that the continued product of the first, square of the second and cube of the third may be maximum.	6 Marks	L4	CO2	PO1 PO2
	b)	Using Lagrange's method of undetermined multipliers, calculate the maximum value of xyz *when* $x + y + z = a$.	6 Marks	L3	CO2	PO1 PO2

UNIT-IV

7.	a)	Evaluate $\iint_R xydxdy$ where R is the region by $x-axis,\ x=2a\ and\ x^2=4ay$.	6 Marks	L5	CO2	PO1 PO2
	b)	Apply change the order of integration and evaluate $\int_0^{\infty}\int_x^{\infty} \frac{e^{-y}}{y}\,dydx$.	6 Marks	L3	CO2	PO1 PO2
		(OR)				
8.	a)	Evaluate $\int_0^a \int_o^x \int_0^{x+y} e^{x+y+z}\,dzdydx.$	6 Marks	L5	CO2	PO1
	b)	By changing to polar coordinates, evaluate $\int_0^{\infty}\int_0^{\infty} e^{-\left(x^2+y^2\right)}dxdy.$	6 Marks	L3	CO2	PO1 PO2

UNIT-V

9.	a)	Determine directional derivative of the field $xy+yz+zx$ at the point $(1,1,1)$ in the direction of $\bar{i}+\bar{j}+\bar{k}$.	6 Marks	L3	CO3	PO1
	b)	Evaluate the line integral $\int_c \left(x^2+xy\right)dx+\left(x^2+y^2\right)dy$, where C is the square formed by the lines $y=\pm 1\ and\ x=\pm 1$.	6 Marks	L5	CO3	PO1 PO2
		(OR)				
10.		Verify Gauss divergence theorem for the field $\bar{F}\left(x^2-yz\right)\bar{i}+\left(y^2-zx\right)\bar{j}+\left(z^2-xy\right)\bar{k}$ taken over the rectangular parallelepiped $0\le x\le a,\ 0\le y\le b,\ 0\le z\le c.$	12 Marks	L5	CO3	PO1 PO2

CODE No.: 19BT1BS03 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations August – 2021

ENGINEERING PHYSICS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	List the conditions for sustained interference.	4 Marks	L1	CO1	PO1
	b)	Describe the construction and working of a Nicol Prism.	8 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Why do soap bubbles appear multicolored when viewed under sun light?	2 Marks	L1	CO1	PO1
	b)	Explain necessary theory of Fraunhoffer diffraction due to 'n' slits.	10 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	Recall the principle behind the functioning of optical fiber. Explain the differences between the step index fiber and graded index fiber.	9 Marks	L2	CO2	PO1 PO2
	b)	Calculate the numerical aperture and acceptance angle for an optical fiber with core and cladding refractive indices being 1.48 and 1.45 respectively.	3 Marks	L3	CO2	PO2
		(OR)				
4.	a)	Derive an expression for acceptance angle and numerical aperture of an optical fiber.	8 Marks	L3	CO2	PO1 PO2
	b)	List the applications of fiber optic sensors.	4 Marks	L1	CO2	PO2
		UNIT-III				
5.	a)	Define electrical conductivity and develop an equation for electrical conductivity of intrinsic semiconductors.	6 Marks	L3	CO3	PO1 PO2
	b)	Distinguish the direct and indirect band gap semiconductors.	6 Marks	L4	CO3	PO1
		(OR)				
6.	a)	Discuss the formation of extrinsic semiconductors.	5 Marks	L2	CO3	PO1
	b)	Develop an equation for density of charge carriers in p-type semiconductors.	7 Marks	L3	CO3	PO2
		UNIT-IV				
7.	a)	Summarize the frequency dependence of various types of polarizations with a neat graph.	6 Marks	L2	CO4	PO2
	b)	Define the terms: i) Dielectric material. ii) Dielectric constant. iii) Dielectric break down.	6 Marks	L1	CO4	PO1
		(OR)				
8.	a)	Define the terms magnetic field (H) and magnetic induction (B). Discuss on soft and hard magnetic materials.	7 Marks	L2	CO4	PO1
	b)	What is Bohr magnetron? How it related to magnetic moment of electron?	5 Marks	L1	CO4	PO1 PO2

UNIT-V

9.	a)	Is superconductors' exhibits diamagnetic nature? Justify. Outline applications of superconductors in various fields.	6 Marks	L2	CO5	PO1
	b)	Explain the BCS theory of superconductivity.	6 Marks	L2	CO5	PO1
		(OR)				
10.	a)	Describe any one method for synthesize nanomaterials.	6 Marks	L2	CO5	PO1
	b)	Discuss the various properties of nanomaterials.	6 Marks	L2	CO5	PO1

CODE No.: 19BT1BS04 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations August – 2021

ENGINEERING CHEMISTRY

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Apply the Schrödinger wave equation to the electron present in the hydrogen atom.	8 Marks	L3	CO1	PO1
	b)	Outline the bonding and anti-bonding molecular orbitals.	4 Marks	L2	CO1	PO1
		(OR)				
2.		Write the main postulates of VSEPR Theory. How this theory explain the shapes of the molecules?	12 Marks	L 1	CO1	PO1 PO2
		UNIT-II				
3.		If a boiler is fed with water containing $MgCl_2$, $MgSO_4$, $CaSO_4$, Na_2CO_3, O_2, oil. Identify the various boiler troubles arise and explain how they can be avoided.	12 Marks	L3	CO2	PO1 PO2 PO6
		(OR)				
4.	a)	Discuss the impurities in water and their consequences.	7 Marks	L2	CO2	PO1 PO6
	b)	Calculate the temporary, permanent and total hardness of a water sample containing $Mg(HCO_3)_2$ = 73 mg/L, $Ca(HCO_3)_2$ = 162 mg/L, $MgCl_2$ = 95 mg/L, $CaSO_4$ = 136 mg/L.	5 Marks	L3	CO2	PO1 PO2
		UNIT-III				
5.	a)	Explain the factors influencing the electrode potential in terms of Nernst equation.	8 Marks	L2	CO3	PO1 PO2
	b)	Define primary cell. Discuss the construction and working principle of dry cell.	4 Marks	L1	CO3	PO1
		(OR)				
6.		Discuss the various factors affecting rate of corrosion.	12 Marks	L2	CO3	PO1
		UNIT-IV				
7.		Discuss the principle and working of a UV-Visible spectrometer with the help of a block diagram.	12 Marks	L2	CO4	PO1 PO5
		(OR)				
8.	a)	Explain different types of fundamental modes of vibrations.	6 Marks	L2	CO4	PO1
	b)	Write the principle and applications of Scanning Electron Microscope.	6 Marks	L1	CO4	PO1
		UNIT-V				
9.	a)	How fuels are classified? What are important characteristics of good fuel? Explain with suitable example.	6 Marks	L1	CO5	PO1
	b)	What do you understand with the knocking of a fuel? Report the ways to improve the anti-knocking characteristics of a fuel.	6 Marks	L1	CO5	PO1
		(OR)				
10.	a)	Explain the mechanism of lubrication appears in sewing machines and moving surfaces under very high pressure and speed.	8 Marks	L2	CO5	PO1 PO2
	b)	Define lubrication. Recall some major functions of lubricants.	4 Marks	L1	CO5	PO1 PO2

❀ ❀ ❀

CODE No.: 19BT10201 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations August – 2021

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the principle of single loop generator for producing sinusoidal voltage.	6 Marks	L2	CO1	PO2
	b)	A 4Ω resistor has a current $i=2.5\sin(500t)$mA. Find the voltage, power and energy over one cycle.	6 Marks	L3	CO1	PO2
		(OR)				
2.	a)	State Kirchhoff's laws and validate the law with a suitable example.	6 Marks	L1	CO1	PO1
	b)	Obtain the RMS and average values of a sinusoidal voltage of peak V_m and angular frequency ω rad/s.	6 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	With neat sketch, explain the operation of hydro power plant.	6 Marks	L1	CO2	PO1
	b)	Illustrate the significance of : i) Fuse. ii) Relay. iii) Most Economical power factor.	6 Marks	L1	CO2	PO1
		(OR)				
4.	a)	Elucidate the importance of Solar Power generation against the electric power generation through Hydel and Thermal.	6 Marks	L2	CO2	PO1
	b)	Exemplify the significance of power factor and enumerate the methods of improving it.	6 Marks	L2	CO2	PO2
		UNIT-III				
5.	a)	With neat sketch, demonstrate the working principle of single phase transformer.	6 Marks	L1	CO3	PO1
	b)	Explain the working principle of 3-phase induction motor and mention any one application of it.	6 Marks	L1	CO3	PO5
		(OR)				
6.	a)	Explain the constructional details of single phase capacitor start and run induction motor.	6 Marks	L1	CO3	PO1
	b)	Explain the constructional details of synchronous machine and mention any one application.	6 Marks	L1	CO3	PO5
		UNIT-IV				
7.		Explain the operation of a p-n junction diode in forward biased and reverse biased conditions. Draw its V-I characteristics.	12 Marks	L2	CO4	PO1
		(OR)				
8.	a)	Distinguish between Half wave Rectifier and full wave rectifier.	6 Marks	L2	CO4	PO2
	b)	Explain the V-I characteristics of Zener diode and draw the waveforms.	6 Marks	L1	CO4	PO1

UNIT-V

9.	a)	Draw the block diagram of Op-amp and explain its operation in detail.	6 Marks	L1	CO5	PO1
	b)	In an inverting adder circuit, the input voltages are 0.3V, 0.5V and 0.1V while $R_1=R_2=R_3=1$ KΩ. If $R_f=10$ KΩ, calculate the output voltage.	6 Marks	L3	CO5	PO4
		(OR)				
10.	a)	Examine and derive an expression for V_0 of the differentiator circuit by using an Op-amp.	6 Marks	L2	CO5	PO2
	b)	In an integrator circuit, $R_iC_f=1$ Sec., and the input is a step voltage $V_{in}=2V$ for $0\leq t\leq 4$. Determine the output voltage and sketch it.	6 Marks	L3	CO5	PO4

CODE No.: 19BT10341 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations August – 2021

BASIC CIVIL AND MECHANICAL ENGINEERING

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

PART-A

UNIT-I

1.	a)	How civil engineering contributes to the development of society?	6 Marks	L2	CO1	PO1 PO6
	b)	What are requirements of good building bricks? State the important varieties of building bricks.	6 Marks	L2	CO1	PO1 PO8
		(OR)				
2.		The following staff reading were observed successively with a level the instrument having been moved after third and seventh readings 2.550, 1.600, 0.900, 3.000, 1.950, 1.500, 0.950, 0.750, 1.600, 1.300 the above readings in a page of a field. Calculate the RL of all the points by height of collimation method. The first reading was taken with a staff held on a bench mark of RL 80 m. Apply arithmetical check.	12 Marks	L4	CO1	PO1 PO2 PO5

UNIT-II

3.	a)	How will you apply the rain water harvesting system in residential building?	6 Marks	L4	CO1	PO1 PO7
	b)	Mention the types of bridges used for civil engineering construction.	6 Marks	L1	CO1	PO1
		(OR)				
4.	a)	Explain the types of foundation used in different sites with neat sketches of foundation.	6 Marks	L4	CO1	PO1 PO10
	b)	Illustrate the different types of brick masonry in civil engineering infrastructure with neat sketches.	6 Marks	L2	CO1	PO1 PO10

PART-B

UNIT-III

5.		Differentiate between single acting and double acting reciprocating pump.	12 Marks	L2	CO2	PO1
		(OR)				
6.		Describe the working principle of single acting reciprocating pump with neat sketch.	12 Marks	L2	CO2	PO1

UNIT-IV

7.	a)	Write the advantages and Disadvantages of chain drive over belt and rope drive.	6 Marks	L1	CO2	PO1
	b)	Compare cross belt drive and open belt drive on the basis of: i) Velocity ratio. ii) Direction of driven pulley. iii) Length of belt drives. iv) Application.	6 Marks	L2	CO2	PO1
		(OR)				

8.	a)	Write short notes on the following: i) Belt drive. ii) Chain drive. iii) Rope drive.	6 Marks	L1	CO2	PO1
	b)	The central distance two shaft is 4m having two pulleys with diameter having 500mm and 700mm respectively find the length of belt required – i) for open belt drive. ii) for cross belt drive.	6 Marks	L3	CO2	PO1 PO2

UNIT-V

9.	Give a comprehensive explanation of forging process. What are its limitations? Mention some of its applications.	12 Marks	L2	CO2	PO1
	(OR)				
10.	Compare and contrast between taper turning and thread cutting operations.	12 Marks	L2	CO2	PO1

CODE No.: 19BT10501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations August – 2021

PROGRAMMING FOR PROBLEM SOLVING

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Draw a flow chart to find sum of individual digits of a given number.	6 Marks	L3	CO1	PO2
	b)	Illustrate the concept of type casting in Python with examples.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	List and explain different types of literals.	6 Marks	L1	CO1	PO1
	b)	Explain about the top down design in proLem solving.	6 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Write a python script that will read an unspecified number of integers and will determine how many positive and negative values have been read. Your program ends when the input is 0.	6 Marks	L3	CO1	PO2
	b)	Display the following pattern using python script. 1 212 32123 4321234 543212345	6 Marks	L3	CO1	PO2
		(OR)				
4.	a)	List and explain selection statements used in python with examples.	6 Marks	L1	CO1	PO1
	b)	Write a python script to print GCD of two numbers.	6 Marks	L3	CO1	PO3
		UNIT-III				
5.	a)	Write a Python script that checks whether a given string is a palindrome or not. Ex: MADAM is a palindrome	6 Marks	L3	CO1	PO2
	b)	Write a python script to demonstrate following string methods : index(), find(), count(), split(), join().	6 Marks	L2	CO1	PO1
		(OR)				
6.	a)	Develop a python script to read employee details like eid, empname, branch, salary and sort records based on empname.	6 Marks	L3	CO1	PO3
	b)	List the applications of stacks and queues.	6 Marks	L2	CO1	PO1
		UNIT-IV				
7.	a)	Illustrate following file handling functions with an example program. i) open() ii) read() iii) readline() iv) readlines()	6 Marks	L2	CO2	PO1
	b)	Define scope and explain usage of global keyword.	6 Marks	L2	CO2	PO1
		(OR)				
8.	a)	Define function. Explain four different types of arguments used in functions.	6 Marks	L1	CO2	PO1
	b)	Explain functionality of the following functions. i) ones() ii) arrange() iii) logspace() iv) zeros()	6 Marks	L2	CO2	PO1

UNIT-V

9.	a)	Draw Histograms by considering continuous data.	6 Marks	L3	CO2	PO3
	b)	Write a python script to drop the missing data from the data frame.	6 Marks	L3	CO2	PO3
		(OR)				
10.	a)	Create a data frame. It contains students' subject wise marks. Add a new column name called total marks for the existing frame.	6 Marks	L3	CO2	PO3
	b)	Illustrate different techniques included in accessing data from data frame.	6 Marks	L3	CO2	PO2

CODE No.: 19BT1BS01 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations February - 2021

DIFFERENTIAL EQUATIONS AND MULTIVARAIBLE CALCULUS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Solve the differential equation $(D^3 - 5D^2 + 8D - 4)y = e^{2x}$.	6 Marks	L3	CO1	PO1 PO2
	b)	Solve the differential equation $(D^3 - 7D^2 + 14D - 8)y = e^x Cos2x$	6 Marks	L3	CO1	PO1 PO2
		(OR)				
2.	a)	Apply the method of variation of parameters solve $(D^2 - 2D)y = e^x Sinx$.	6 Marks	L3	CO1	PO1 PO2
	b)	Change the differential equation $(x+1)^2 \frac{d^2y}{dx^2} - 3(x+1)\frac{dy}{dx} + 4y = x^2 + x + 1$ into linear equation with constant coefficients and find the general solution.	6 Marks	L2	CO1	PO1 PO2

UNIT-II

3.	a)	Construct the partial differential equation by eliminating the arbitrary function from $Z = f(x^2 + y^2) + x + y$.	6 Marks	L3	CO1	PO1 PO2
	b)	Find the complete solution of the partial differential equation $p^2 - q^2 = x - y$.	6 Marks	L1	CO1	PO1 PO2
		(OR)				
4.	a)	Solve the partial differential equation $r - 4s + 4t = e^{2x+y}$.	6 Marks	L3	CO1	PO1 PO2
	b)	Using method of separation of variables, solve $\frac{\partial u}{\partial x} = 4\frac{\partial u}{\partial y}$, *given that* $u(0,y) = 8e^{-3y}$.	6 Marks	L3	CO1	PO1 PO2

UNIT-III

5.	a)	Find $\frac{du}{dt}$; *if* $u = x^2y^3$, *where* $x = \log t$ *and* $y = e^t$.	6 Marks	L1	CO2	PO1
	b)	If $u = x^2 - y^2, v = 2xy$ where $x = r\cos\theta, y = r\,Sin\theta$, verify $\frac{\partial(u,v)}{\partial(r,\theta)} = 4r^3$ s.	6 Marks	L5	CO2	PO1 PO2
		(OR)				
6.	a)	Examine for maximum and minimum values of $Sinx + Siny + Sin(x+y)$.	6 Marks	L5	CO2	PO1 PO2
	b)	Calculate the minimum distance from the origin to the plane $x + 2y + 3z = 14$ using Lagrange's method of multipliers.	6 Marks	L3	CO2	PO1 PO2

UNIT-IV

7.	a)	Evaluate $\int\int xy\,dxdy$ over the positive quadrant of the circle $x^2 + y^2 = a^2$.	6 Marks	L5	CO2	PO1 PO2
	b)	Using change the order of integration evaluate $\int_0^a \int_{\frac{x^2}{a}}^{2a-x} xy^2\,dydx$.	6 Marks	L3	CO2	PO1 PO2
		(OR)				
8.	a)	Evaluate $\int_1^e \int_1^{\log y} \int_1^{e^x} (\log z)\,dzdxdy$.	6 Marks	L5	CO2	PO1
	b)	By changing into polar coordinates, Evaluate $\int_0^a \int_0^{\sqrt{a^2-y^2}} (x^2 + y^2)\,dxdy$.	6 Marks	L3	CO2	PO1 PO2

UNIT-V

9.	a)	Find the directional derivative of $f(x,y,z) = xy^3 + yz^3$ at the point (2,-1,1) in the direction of the vector $\vec{i} + 2\vec{j} + 2\vec{k}$.	6 Marks	L1	CO3	PO1
	b)	Compute the line integral $\int_C (y^2dx - x^2dy)$ about the triangle whose vertices are (1,0) (0,1) and (-1,0).	6 Marks	L3	CO3	PO1 PO2
		(OR)				
10.		Verify Stoke's theorem for $\vec{F} = (x^2 + y^2)\vec{i} - 2xy\vec{J}$ taken around the rectangle bounded by the lines $x = \pm a, y = 0, y = b$ ssw.	12 Marks	L5	CO3	PO1 PO2

CODE No.: 19BT1BS03 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations February - 2021

ENGINEERING PHYSICS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Derive an expression for interference in thin films due to reflection.	8 Marks	L3	CO1	PO1 PO2
	b)	Distinguish between interference and diffraction.	4 Marks	L4	CO1	PO1
		(OR)				
2.	a)	Write a short note on Nicol's prism.	8 Marks	L1	CO1	PO1
	b)	Fraunhofer diffraction pattern is obtained with a slit of width 0.3mm and a light of wavelength, λ = 5860A^0. Calculate the angles at which the 1st dark band and the next bright band are formed.	4 Marks	L4	CO1	PO2
		UNIT-II				
3.	a)	Write Maxwell's equations in integral and differential forms. Explain their physical significance.	8 Marks	L3	CO2	PO2
	b)	Briefly explain about divergence of electric and magnetic fields.	4 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Explain various types of optical fibers.	8 Marks	L2	CO2	PO2
	b)	A step index fiber has a core of refractive index 1.5 and the numerical aperture of the fiber is 0.26. Calculate α_m and ϕ_m for the fiber if the medium surrounding the fiber is air.	4 Marks	L4	CO2	PO2
		UNIT-III				
5.	a)	Using the expression of electron concentration and hole concentration for an intrinsic semiconductor show that the intrinsic carrier density is independent of Fermi Level.	8 Marks	L3	CO3	PO1
	b)	Write short notes on Drift and Diffusion currents.	4 Marks	L1	CO3	PO1
		(OR)				
6.	a)	What is Hall effect? Derive the expression for Hall coefficient. Write its applications.	8 Marks	L3	CO3	PO1 PO2
	b)	What are direct and indirect band gap semiconductors?	4 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	Derive an expression for internal field in dielectrics.	7 Marks	L2	CO4	PO1
	b)	Derive Clausius-Mosotti equation and write its physical significance.	5 Marks	L2	CO4	PO1 PO2
		(OR)				
8.	a)	Define the terms magnetic dipole moment and magnetization.	4 Marks	L2	CO4	PO1
	b)	Distinguish between dia, para and ferro magnetic materials.	8 Marks	L2	CO4	PO1
		UNIT-V				
9.	a)	What is superconductivity? Explain various types of superconductors.	8 Marks	L4	CO5	PO1
	b)	State and explain Meissner effect.	4 Marks	L1	CO5	PO1
		(OR)				
10.	a)	Explain how nano materials are prepared using PLD method.	7 Marks	L1	CO5	PO1
	b)	List the applications of nano materials.	5 Marks	L1	CO5	PO1

❀ ❀ ❀

CODE No.: 19BT1BS04 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations February – 2021

ENGINEERING CHEMISTRY

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Apply the Schrodinger wave equation to particle in a box.	12 Marks	L3	CO1	PO1 PO2
		(OR)				
2.	a)	How does the molecular orbital theory help to explain the paramagnetic character of oxygen and diamagnetic character of nitrogen?	8 Marks	L2	CO1	PO1 PO2
	b)	What do you understand by the term bonding and antibonding orbitals?	4 Marks	L2	CO1	PO1 PO2

UNIT-II

3.	a)	Define carbonate and non-carbonate hardness of water. Write the disadvantages of hard water.	6 Marks	L1	CO2	PO1 PO2
	b)	50ml of standard hard water containing 1mg of $CaCO_3$ per ml consumed 20ml of EDTA. 50ml of a water sample consumed 25ml of same EDTA solution, using eriochrome black-T indicator. Calculate the total hardness of water sample in p.p.m.	6 Marks	L3	CO2	PO1 PO2
		(OR)				
4.	a)	Write note on boiler corrosion and caustic-embrittlement.	6 Marks	L1	CO2	PO1 PO2
	b)	Give the specifications of potable water according to WHO guidelines.	6 Marks	L2	CO2	PO1 PO2

UNIT-III

5.	a)	What are the reference electrodes? Explain the construction and working of calomel electrode.	6 Marks	L1	CO3	PO1 PO2
	b)	Explain the working principle of H_2-O_2 fuel cell with reactions.	6 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Discuss the various factors influencing the rate of corrosion.	6 Marks	L2	CO3	PO1
	b)	Explain how the corrosion can be minimized by cathodic protection.	6 Marks	L2	CO3	PO1

UNIT-IV

7.	a)	Discuss the instrumentation of UV-VIS Spectrometer with neat diagram.	8 Marks	L2	CO4	PO1 PO5
	b)	Explain bathochromic and hypsochromic shifts with suitable examples.	4 Marks	L2	CO4	PO1
		(OR)				
8.	a)	Describe the various molecular vibrations in the IR Spectroscopy.	6 Marks	L2	CO4	PO1
	b)	Write the principle and applications of transmission electron microscope.	6 Marks	L1	CO4	PO1

UNIT-V

9.	a)	Define calorific value of a fuel. Distinguish between gross and net calorific values of a fuel.	4 Marks	L1	CO5	PO1
	b)	What is meant by cracking of petroleum? Write the advantages of catalytic cracking over thermal cracking.	8 Marks	L2	CO5	PO1
		(OR)				
10.	a)	Explain mechanism of fluid and boundary lubrication.	8 Marks	L2	CO5	PO1 PO2
	b)	Write the chief functions of lubricants.	4 Marks	L1	CO5	PO1 PO2

CODE No.: 19BT1HS01 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations February - 2021

COMMUNICATIVE ENGLISH

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		"Non-verbal communication plays vital role in effectiveness of interaction." Justify the given statement.	12 Marks	L4	CO1	PO2, PO1, PO10
		(OR)				
2.	a)	Define and explain the various modes of effective communication.	6 Marks	L2	CO1	PO1, PO10
	b)	"Understanding different types of communication styles are vital for business communication". Evaluate this statement with suitable examples.	6 Marks	L2	CO1	PO1, PO10
		UNIT-II				
3.		"Barrier to effective listening is present at every factor of the listening process". Justify the following statement from your viewpoint.	12 Marks	L4	CO1	PO2, PO1, PO10
		(OR)				
4.	a)	"For successful implementation of instructions or briefs note-taking if an effective tool". Discuss the above statement in the context of listening for specifics.	6 Marks	L4	CO1	PO1, PO10
	b)	Write about the various types of listening. Give suitable examples.	6 Marks	L4	CO1	PO1, PO10
		UNIT-III				
5.		"Confidence, clarity and fluency pay a significant role in speeches and presentations." Justify the given statement with suitable tips to enhance.	12 Marks	L4	CO1	PO1, PO10
		(OR)				
6.	a)	Significance of planning, preparation and procedure for effective presentation in seminars, conferences etc.	6 Marks	L2	CO1	PO1, PO10
	b)	Write about the paralinguistic features of speaking.	6 Marks	L2	CO1	PO1, PO10
		UNIT-IV				
7.		Discuss briefly the SQ3R technique for constructive reading.	12 Marks	L2	CO1	PO5, PO1, PO2, PO10
		(OR)				

8.	a)	Discuss at length with suitable examples the important techniques for good comprehension of any type of reading	6 Marks	L2	CO1	PO1, PO10
	b)	**Identify the topic sentence and the key words in the topic sentence that the other sentences support in the paragraph given below.** Exercise is really good for one's physical and mental health. It is proven that aerobic exercise is good for the heart, which is very important to overall health. I used to run every day, but now I go to dance classes to get my aerobic exercise**.** Strength training is important for maintaining muscle mass and improving bone density. Both muscle mass and bone density can decrease as we age, so improving them through strength training is important. My grandmother broke a hip last year because her bones were so fragile. All kinds of exercise have been shown to relieve depression, anxiety, and stress.	6 Marks	L2	CO1	PO1, PO10

UNIT-V

9.		"Using the right words in the right context is one of the essential elements of effective writing". Illustrate.	12 Marks	L4	CO1	PO2, PO1, PO10

(OR)

10.	a)	Present your understanding of the various steps to compose a good essay.	6 Marks	L2	CO1	PO1, PO10
	b)	Define and explain precise writing and its uses with suitable examples.	6 Marks	L2	CO1	PO1, PO10

CODE No.: 19BT10201 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations February - 2021

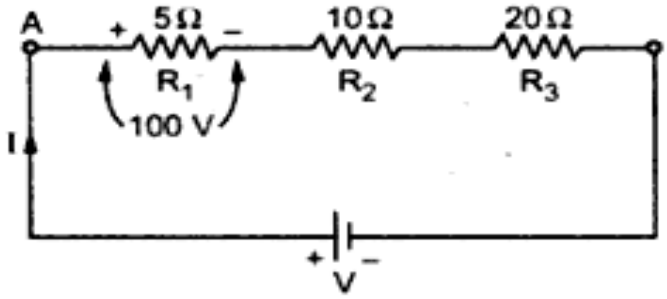
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

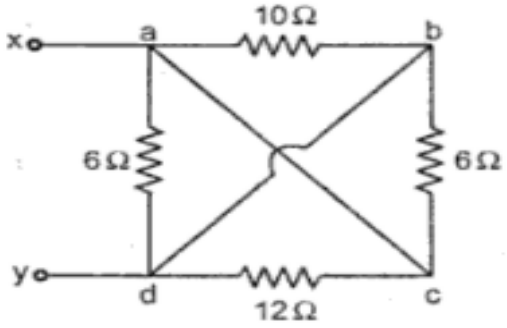
Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	For the given circuit: i) Find the equivalent resistance across the supply. ii) If the voltage drop across 5Ω is 100V, find the supply voltage. iii) Find the power consumed by each resistor. 	6 Marks	L3	CO1	PO3
	b)	A coil having a resistance of 7 and an inductance of 31.8mH is connected to 230V, 50Hz supply. Calculate the: i) circuit current. ii) phase angle. iii) power factor. iv) power consumed. v) reactive power. vi) apparent power.	6 Marks	L3	CO1	PO2

(OR)

2.	a)	A voltage $v = 200 \sin \pi t$ is applied to a load having 200Ω in series with 638mH inductor. Estimate power consumed by the load and reactive power of load.	6 Marks	L3	CO1	PO2
	b)	Find the equivalent resistance across the terminals X and Y. 	6 Marks	L3	CO1	PO3

UNIT-II

3.	a)	Discuss in detail to improve the power factor of a given power system.	6 Marks	L2	CO2	PO1
	b)	Explain the block diagram of inverter with details.	6 Marks	L1	CO2	PO1

(OR)

4.	a)	List out the difference between MCB and MCCB.	6 Marks	L2	CO2	PO2
	b)	What is the importance of earthing and explain different types of earthing?	6 Marks	L2	CO2	PO4

UNIT-III

5.	a)	Explain about torque-slip characteristics in 3-Ø Induction motor.	6 Marks	L2	CO3	PO2
	b)	The primary of a 50Hz, step-down transformer has 480 turns and is fed from 6400V supply. Find: i) the peak value of the flux produced in the core. ii) the voltage across the secondary winding if it has 20 turns.	6 Marks	L3	CO3	PO3
		(OR)				
6.	a)	Explain the construction and working of synchronous machine.	6 Marks	L2	CO3	PO2
	b)	A 50Hz, 4-pole induction motor has an induced **emf** in the rotor with a frequency of 2 Hz. Calculate: i) synchronous speed. ii) slip. iii) speed of the motor.	6 Marks	L3	CO3	PO3

UNIT-IV

7.	a)	Draw and explain full-wave rectifier with relevant waveforms.	6 Marks	L2	CO4	PO1
	b)	Draw the circuit diagram for finding the CB characteristics of a Transistor.	6 Marks	L2	CO4	PO2
		(OR)				
8.	a)	Compare and contrast Zener breakdown and Avalanche breakdown.	6 Marks	L2	CO4	PO4
	b)	A transistor has $I_B = 100\mu A$ and $I_C = 2\mu A$. Find: i) β of the transistor. ii) α of the transistor. iii) Emitter current I_E.	6 Marks	L3	CO4	PO3

UNIT-V

9.	a)	Explain the basic internal block diagram of a typical operational amplifier.	6 Marks	L1	CO5	PO1
	b)	Design a practical integrator circuit with a DC gain of 20 to integrate a square wave of 25kHz.	6 Marks	L3	CO5	PO3
		(OR)				
10.	a)	What are the two closed loop configurations of an Op-Amp? Obtain the gains in both the cases.	6 Marks	L2	CO5	PO1
	b)	An Op-Amp has a slew rate of 2V/μs. What is the maximum frequency of an output sinusoid of peak value 5V at which the distortion sets in due to the slew rate limitation?	6 Marks	L3	CO5	PO4

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations February - 2021

BASIC CIVIL AND MECHANICAL ENGINEERING

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

PART-A

UNIT-I

1.		Discuss the classifications of surveying based on: i) Instruments used. ii) Objectives of survey. iii) Methods employed.	12 Marks	L3	CO1	PO1 PO8
		(OR)				
2.	a)	Discuss how a civil engineer contributes to welfare of society.	4 Marks	L2	CO1	PO1 PO5
	b)	Define composite materials. List out various applications, advantages and limitations of composites.	8 Marks	L1	CO1	PO1

UNIT-II

3.	a)	What is foundation? State the requirements of good foundations.	6 Marks	L1	CO2	PO1
	b)	Briefly describe various types of stairs.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Describe with the help of a neat sketch, the method of taking a house connection for water supply.	6 Marks	L4	CO2	PO1 PO8
	b)	Compare merits and demerits of flat and pitched roofs.	6 Marks	L2	CO2	PO1

PART-B

UNIT-III

5.		Discuss the working principle of single acting reciprocating pump with the help of neat sketch.	12 Marks	L2	CO3	PO1 PO5
		(OR)				
6.	a)	List out major parts of an IC engine. Explain any four of them in detail.	8 Marks	L1	CO3	PO1
	b)	Compare merits and demerits of SI engines and CI engines.	4 Marks	L2	CO3	PO1

UNIT-IV

7.	a)	Explain initial tension.	4 Marks	L2	CO3	PO1
	b)	Write the advantages and disadvantages of rope drives.	8 Marks	L2	CO3	PO1
		(OR)				
8.	a)	Write the expression for the power transmitted by the belts.	4 Marks	L2	CO3	PO1
	b)	Name different types of belt drives. Explain any two belt drives with neat sketches.	8 Marks	L4	CO3	PO1 PO8

UNIT-V

9.	a)	Define welding. Explain the working principle and operation of Arc welding.	8 Marks	L2	CO4	PO1
	b)	Explain how forging improves the mechanical properties of components with neat sketch.	4 Marks	L4	CO4	PO1 PO8
		(OR)				
10.	a)	Define Casting and discuss the merits and demerits of casting process over other manufacturing methods.	8 Marks	L2	CO4	PO1
	b)	List out various operations that can be carried out on Lathe.	4 Marks	L1	CO4	PO1 PO8

CODE No.: 19BT10501 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations February – 2021

PROGRAMMING FOR PROBLEM SOLVING

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Define algorithm and explain the building blocks of flow charts.	6 Marks	L1	CO1	PO1
	b)	What are fundamental data types in Python? Explain different operators with the help of a Python script.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Briefly explain about efficiency of algorithms.	6 Marks	L1	CO1	PO1
	b)	What is meant by type conversion? Explain different type conversions with help of a Python script.	6 Marks	L1	CO1	PO2
		UNIT-II				
3.	a)	Write a Python program for generating biggest of three numbers.	6 Marks	L2	CO1	PO2
	b)	Differentiate break and continue statements with suitable examples.	6 Marks	L1	CO1	PO1
		(OR)				
4.	a)	Write a Python script to reverse the given number.	6 Marks	L2	CO1	PO2
	b)	Write a Python script to display the sum of first ‘n’ natural numbers.	6 Marks	L2	CO1	PO2
		UNIT-III				
5.	a)	Define List and explain different operations that we can perform on List with the help of a program.	6 Marks	L1	CO1	PO1
	b)	Write a Python program to implement Queue.	6 Marks	L1	CO1	PO2
		(OR)				
6.	a)	Define Dictionary and write a Python script to illustrate Dictionary operations.	6 Marks	L2	CO1	PO2
	b)	Write the applications of Stacks and Queues.	6 Marks	L1	CO1	PO1
		UNIT-IV				
7.	a)	Write a Python program to implement basic arithmetic operations using functions.	6 Marks	L2	CO2	PO2
	b)	Write a Python script to read a file and display the total number of words present in that file.	6 Marks	L2	CO2	PO3
		(OR)				
8.	a)	Develop a Python program to find the maximum and minimum numbers present in a List using recursive function.	6 Marks	L2	CO2	PO2
	b)	Demonstrate the basic file operations with the help of a Python script.	6 Marks	L1	CO2	PO2
		UNIT-V				
9.	a)	Write a Python program to display bar plot and histogram for student details like age, weight and height.	6 Marks	L2	CO2	PO3
	b)	Explain insertion and deletion of selected rows and columns from a data frame with the help of an example.	6 Marks	L3	CO2	PO3
		(OR)				
10.	a)	Illustrate the use of loc( ) and iloc( ) with an example program.	6 Marks	L2	CO2	PO1
	b)	Load data from **csv** file to data frame and print head( ) and tail( ) of a data frame.	6 Marks	L3	CO2	PO2

❀ ❀ ❀

CODE No.: 19BT1BS01 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations January - 2022

DIFFERENTIAL EQUATIONS AND MULTIVARAIBLE CALCULUS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Obtain the solution of linear differential equation of second order non homogeneous equation $\frac{d^2y}{dx^2} + \frac{dy}{dx} = x^2 + 2x + 4$.	6 Marks	L3	CO1	PO1 PO2
	b)	1. Find the general solution of the differential equation $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + 4y = e^x \cos x$.	6 Marks	L3	CO1	PO1 PO2
		(OR)				
2.	a)	2. Convert the given differential equation into linear differential equation with constant coefficients by using suitable substitution $x^2\frac{d^2y}{dx^2} - x\frac{dy}{dx} + y = \log x$.	6 Marks	L3	CO1	PO1 PO2
	b)	3. Solve by method of variation of parameters $\frac{d^2y}{dx^2} + y = \tan x$.	6 Marks	L3	CO1	PO1 PO2

UNIT-II

3.	a)	Form the partial differential equation of the following by eliminating the arbitrary functions from $z = f(x+ct) + g(x-ct)$.	6 Marks	L2	CO1	PO1 PO2
	b)	Apply Lagrange's method, solve the linear partial differential equation $x(y-z)p + y(z-x)q = z(x-y)$.	6 Marks	L3	CO1	PO1 PO2
		(OR)				
4.	a)	1. Obtain the solution of partial differential equation r-5s+6t = e^{4x+y}. Here r, s and t are usual notations.	6 Marks	L2	CO1	PO1
	b)	Using the method of separation of variables, solve $\frac{\partial u}{\partial x} = 5\frac{\partial u}{\partial y} + u$, *where* $u(x,0) = 6e^{-12x}$.	6 Marks	L3	CO1	PO1

UNIT-III

5.	a)	If u= sin (x^2+y^2), where $a^2x^2+b^2y^2=c^2$, find du/dx.	6 Marks	L1	CO2	PO1
	b)	Determine whether the following functions are functionally dependent or not. If functionally dependent find the relationship between them $u = \frac{x^2-y^2}{x^2+y^2}$, $v = \frac{2xy}{x^2+y^2}$.	6 Marks	L3	CO2	PO1
		(OR)				
6.	a)	Divide 24 into three parts such that the continued product of the first, square of second and cube of third is maximum.	6 Marks	L2	CO2	PO1

	b)	X) Find a point on the plane 3x+2y+z-12=0, which is nearest to the origin.	6 Marks	L3	CO2	PO1

UNIT-IV

7.	a)	b) Evaluate $\iint xy(x+y)dxdy$ over the region R bounded by $y = x^2$ and $y=x$.	6 Marks	L3	CO2	PO1
	b)	Evaluate $\int_0^a \int_0^{\sqrt{a^2-y^2}} \left(x^2+y^2\right) dydx$ by changing to polar coordinates.	6 Marks	L3	CO2	PO1

(OR)

8.	a)	Evaluate $\iiint_V dx\,dy\,dz$ where V is the finte region of space formed by the planes $x = 0, y = 0, z = 0$ and $2x + 3y + 4z = 12$.	6 Marks	L3	CO2	PO1 PO2
	b)	Convert the integral to polar coordinates, evaluate $\int_0^\infty \int_0^\infty e^{-(x^2+y^2)}\,dy\,dx$.	6 Marks	L3	CO2	PO1 PO2

UNIT-V

9.	a)	Find the directional derivative of $f(x,y,z) = xy^2 + yz^3$ at the point (2,-1,1) in the direction of vector I+2J+2K.	6 Marks	L2	CO3	PO1
	b)	Evaluate the line integral $\int_C \left[\left(x^2+xy\right)dx + \left(x^2+y^2\right)dy\right]$ where C is the square formed by the lines $y = \pm 1$ and $x = \pm 1$.	6 Marks	L3	CO3	PO1 PO2

(OR)

10.	a)	2. Apply Green's theorem to evaluate $\int_C (2x^2 - y^2)dx + (x^2+y^2)dy$ where C is the boundary of the area enclosed by x-axis and upper half of the circle $x^2 + y^2 = 4$.	6 Marks	L2	CO3	PO1 PO2
	b)	Using Stoke's theorem evaluate $\int_C [(x+y)dx + (2x-z)dy + (y+z)dz]$ where C is the boundary of the triangle with vertices $(2,0,0), (0,3,0)$ and $(0,0,6)$.	6 Marks	L2	CO3	PO1 PO2

CODE No.: 19BT1BS03 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations January – 2022

ENGINEERING PHYSICS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Obtain the conditions for constructive and destructive interference for a thin film of uniform thickness due to reflected light.	8 Marks	L2	CO1	PO1
	b)	Calculate the thickness of air film at 10^{th} dark ring in Newton's rings system viewed normally by a reflected light of wavelength 500 nm. The diameter of the 10^{th} dark ring is 2mm.	4 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Explain the principle, construction and working of Nicol prism with a neat diagram. Explain Nicol prism as analyser.	9 Marks	L2	CO1	PO1
	b)	A plane polarised light is incident on a quartz plate that is cut parallel to the axis. The minimum thickness of the plate for which the o- and e- ray recombine to form a plane polarised light is found to be 2.55×10^{-3} cm. If μ_o=1.54, calculate the value of μ_e, assuming that $\lambda=5 \times 10^{-5}$ cm.	3 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Demonstrate, with a schematic diagram the refractive index dependence on radial distance for a graded index optical fiber and list any three industrial applications of optical fiber.	9 Marks	L2	CO2	PO1, PO2
	b)	A silica optical fiber has a core refractive index of 1.50 and a cladding refractive index 1.47. Compute the critical angle at core-cladding interface, numerical aperture of the fiber and acceptance angle.	3 Marks	L3	CO2	PO2
		(OR)				
4.	a)	List the four Maxwell's equations and enumerate their physical significance.	8 Marks	L2	CO2	PO1
	b)	Discuss scalar and vector fields.	4 Marks	L1	CO2	PO2

UNIT-III

5.	a)	State Hall Effect. Obtain an expression for Hall coefficient for an extrinsic semiconductor.	8 Marks	L2	CO3	PO2
	b)	A copper strip 2 cm wide 1 mm thick is placed in a magnetic field with B = 1.5 wb/m^2. If a current of 200 A is set up within the strip, calculate Hall voltage that appears across the strip. Assume $R_H = 6 \times 10^{-7} m^3/C$.	4 Marks	L3	CO3	PO2
		(OR)				
6.	a)	Write any six differences between intrinsic and extrinsic semiconductors.	6 Marks	L1	CO3	PO1
	b)	Draw the energy band diagrams of conductors, semiconductors and insulators.	6 Marks	L2	CO3	PO1, PO2

UNIT-IV

7.	a)	Sketch B *Vs* H curve for a ferromagnetic material and explain its nature by indicating the points on the curve.	8 Marks	L2	CO4	PO1
	b)	The magnetization with in a bar of some metal alloy is 1.2 x 106 A/m at an H field of 200 A/m. Compute the following. (i) The magnetic susceptibility. (ii) Magnetic permeability. (iii) Magnetic flux density within the material. (iv) What type of magnetism would the material exhibit.	4 Marks	L3	CO4	PO1, PO2
		(OR)				
8.	a)	Discuss in detail on various types of polarizations by which a dielectric material can polarized.	8 Marks	L2	CO4	PO1
	b)	Explain piezoelectricity.	4 Marks	L1	CO4	PO2

UNIT-V

9.	a)	State and explain Meissner effect. Show that a superconductor in its superconducting state acts as a perfect diamagnet.	8 Marks	L2	CO5	PO1
	b)	If T_c is the critical temperature of a super conductor in absence of magnetic field then calculate the temperature at which the critical field $H_c = H_0/2$.	4 Marks	L3	CO5	PO1 PO2
		(OR)				
10.	a)	Explain different properties of naomaterials.	8 Marks	L2	CO5	PO1
	b)	List the applications of nanomaterials.	4 Marks	L1	CO5	PO1 PO2

CODE No.: 19BT1BS04 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations January – 2022

ENGINEERING CHEMISTRY

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

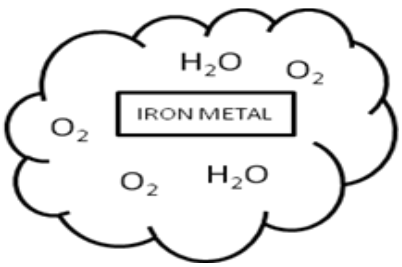
1.	a)	Discuss the postulates of VSEPR theory.	6 Marks	L2	CO1	PO1 PO2
	b)	Explain how VSEPR theory helpful to predicting the shapes of the molecules.	6 Marks	L2	CO1	PO1 PO2
		(OR)				
2.	a)	Explain Molecular Orbital Theory.	6 Marks	L2	CO1	PO1 PO2
	b)	Discuss the bonding in hetero nuclear diatomic molecule NO.	6 Marks	L2	CO1	PO1 PO2

UNIT-II

3.		Define desalination Process. Describe various methods available for desalination and compare them critically.	12 Marks	L2	CO2	PO1 PO6
		(OR)				
4.	a)	Three samples of water are collected from Chittor, Nellore and Kurnool. 100 mL of the water sample collected at Chittor requires 28 mL of 0.01 M EDTA solution on titration. 100 mL of the water sample collected at Nellore required 32 ml of 0.01 M EDTA solution on titration. 100 mL of the water sample collected at Kurnool requires 16 mL of 0.01 M EDTA solution on titration. Discuss the result and suggest the sample which can be directly used for drinking. (WHO standard: Hardness < 200 ppm of CaCO3).	8 Marks	L3	CO2	PO1 PO2
	b)	Discuss Various types of impurities associated with water.	4 Marks	L2	CO2	PO1 PO2

UNIT-III

5.	a)	Identify the type of battery commonly used in each of these consumer electronic products. Discuss the chemistry. i) Smart Phone. ii) Mp3 Player.	6 Marks	L3	CO3	PO1 PO2
	b)	Identify and explain in detail mechanism of the possible type of corrosion that Iron metal will undergo in the pictured environment.	6 Marks	L3	CO3	PO1 PO2



(OR)

6.	a)	Discuss the chemistry, construction and future applications of H_2-O_2 Fuel cell used in earlier space missions.	9 Marks	L2	CO3	PO1 PO2
	b)	Explain how corrosion can be considered as extractive metallurgy in reverse.	3 Marks	L2	CO3	PO1 PO2

UNIT-IV

7.		Discuss the principle and working of Infrared Spectrophotometer with neat diagram.	12 Marks	L2	CO4	PO1 PO5

(OR)

8.		Discuss various applications of UV-Visible and Infrared Spectroscopy.	12 Marks	L2	CO4	PO1 PO5

UNIT-V

9.		What is Synthetic Petrol? Discuss any one method for manufacturing of synthetic petrol.	12 Marks	L2	CO5	PO1, PO2

(OR)

10.	a)	Discuss the classification of Lubricants.	4 Marks	L2	CO5	PO1 PO2
	b)	Discuss any four properties of Lubricants.	8 Marks	L2	CO5	PO1 PO2

CODE No.: 19BT10201 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

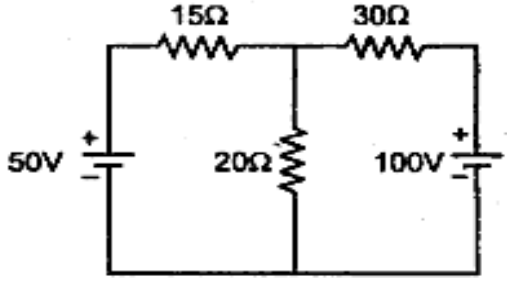
I B.Tech I Semester (SVEC-19) Supplementary Examinations January – 2022

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Calculate the equivalent capacitance if three capacitors of capacitances 2, 4, and 8 micro − Farads are connected in (i) Series (ii) Parallel.	6 Marks	L3	CO1	PO2
	b)	A current of (120-j50)A flows through a circuit when the applied voltage is (8+j12)V. Determine: i) Power factor. ii) Power consumed and reactive power.	6 Marks	L3	CO1	PO3
		(OR)				
2.	a)	Calculate the current through 20Ω resistor. 	6 Marks	L3	CO1	PO3
	b)	A voltage of $v = 141 \sin\{314t + \frac{\pi}{3}\}$ is applied to a resistor of 20Ω. Find the rms value of current and power dissipated.	6 Marks	L3	CO1	PO3

UNIT-II

3.	a)	Explain the operation of thermal power plant with basic layout.	6 Marks	L2	CO2	PO1
	b)	Explain the block diagram of UPS with details.	6 Marks	L1	CO2	PO1
		(OR)				
4.	a)	Explain in detail about RCCB and ELCB.	6 Marks	L2	CO2	PO1
	b)	Discuss in detail the electricity generated from solar panel with neat block diagram.	6 Marks	L2	CO2	PO2

UNIT-III

5.	a)	Explain the principle operation of 3-Ø Induction motor.	6 Marks	L2	CO3	PO1
	b)	Derive the e.m.f equation of a transformer.	6 Marks	L2	CO3	PO2
		(OR)				
6.	a)	Explain the construction and working of resistance start induction run motor.	6 Marks	L1	CO3	PO2
	b)	A 40KVA single phase transformer has 400 turns on primary and 100 turns on secondary the primary isconnected to 200V, 50Hz supply, Determine: i) The secondary voltage on open circuit. ii) The current flowing through the two windings on full load. iii)The maximum value of flux.	6 Marks	L3	CO3	PO3

UNIT-IV

7.	a)	Explain the working of PN diode in forward and reverse bias conditions.	6 Marks	L1	CO4	PO2
	b)	Compare CE, CB and CC configurations.	6 Marks	L2	CO4	PO2
		(OR)				
8.	a)	Prove that the transistor acts an amplifier with suitable circuit diagram.	6 Marks	L2	CO4	PO4
	b)	How does the behaviour of a zener diode differ substantially from that of a normal (rectifying) diode?	6 Marks	L2	CO4	PO5

UNIT-V

9.	a)	List out the ideal characteristics of an operational amplifier and explain voltage transfer characteristics of an ideal op-amp.	6 Marks	L2	CO5	PO2
	b)	Design an op-amp differentiator circuit for the frequency of 1KHz and explain its frequency response.	6 Marks	L3	CO5	PO3
		(OR)				
10.	a)	Design an op-amp based circuit to produce an output $-(v_1 + 2v_2 + 3v_3)$, *where* v_1, v_2 *and* v_3 are the input voltages.	6 Marks	L3	CO5	PO4
	b)	With neat sketch, explain the operation of op-amp integrator circuit.	6 Marks	L2	CO5	PO1

CODE No.: 19BT10341 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations January – 2022

BASIC CIVIL AND MECHANICAL ENGINEERING

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

PART-A

UNIT-I

1.	a)	What is Surveying? Explain how surveying helps in engineering applications.	4 Marks	L2	CO1	PO1 PO5
	b)	The following perpendicular offsets were taken at 10 meter intervals from a survey line to an irregular boundary line. 3.15m, 4.3m, 8.2m, 5.6m, 6.85m, 7.6m, 4.2m, 5.6m, 4.3m Calculate the area enclosed between the survey line, the irregular boundary line, and first and last offsets, by the application of: i) Average ordinate rule. ii) Trapezoidal rule. iii) Simpson's rule.	8 Marks	L4	CO1	PO1 PO2
		(OR)				
2.	a)	What are the requirements of good building stones?	6 Marks	L1	CO1	PO1
	b)	What do you understand by tensile, compressive and shear stresses? Explain.	6 Marks	L1	CO1	PO1

UNIT-II

3.	a)	What is the purpose of a bond in brick masonry? Explain the different types of bonds generally used and their applications.	6 Marks	L2	CO2	PO1 PO7
	b)	What are the different types of Highways and Railways? Explain.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Define Floor area, Carpet area, Plot area and Floor Space Index. What is the FSI for different types of buildings?	6 Marks	L1	CO2	PO1 PO6
	b)	Describe water supply and sanitary systems used in buildings.	6 Marks	L2	CO2	PO1 PO6

PART-B

UNIT-III

5.	a)	What is the function of an Internal Combustion Engine? Give a detailed classification of IC Engines.	6 Marks	L4	CO3	PO1
	b)	Describe the working of an Impulse steam turbine used in thermal power plants.	6 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Differentiate between SI and CI engines.	6 Marks	L4	CO3	PO1
	b)	Describe the working of a Reciprocating Pump.	6 Marks	L2	CO3	PO1

UNIT-IV

7.	a)	Obtain an expression for the length of Open belt drive in terms of pulley diameters and distance between the two pulleys.	6 Marks	L3	CO3	PO1
	b)	The power is transmitted from a pulley 1m diameter running at 200 R.P.M to a pulley 2.25m diameter by means of a belt. Find the speed lost by the driven pulley as a result of creep, if the stress on the tight and slack side of the belt is 1.4 MPa and 0.5 MPa respectively. The Young's modulus for the material of the belt is 100 MPa.	6 Marks	L3	CO3	PO1 PO2

(OR)

8.	a)	Obtain an expression for the condition for transmission of maximum power by a belt drive.	6 Marks	L3	CO3	PO1
	b)	Two parallel shafts are to be connected by spur gearing. The approximate distance between the shafts is 600mm. if one shaft runs at 120 R.P.M and the other at 360 R.P.M, find the number of teeth on each wheel, if the module is 8mm. also determine the exact distance apart of the shafts.	6 Marks	L3	CO3	PO1 PO2

UNIT-V

9.	a)	Describe the process of 'Thread cutting' operation on a lathe machine with a sketch.	6 Marks	L2	CO4	PO1
	b)	Explain the factors that influence the quality of a Casting.	6 Marks	L2	CO4	PO1

(OR)

10.	a)	Write short notes on Grinding and Milling processes.	6 Marks	L2	CO4	PO1
	b)	Explain the process of Forging with the help of a sketch. What are the applications of Forging?	6 Marks	L2	CO4	PO1

CODE No.: 19BT10501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations January – 2022

PROGRAMMING FOR PROBLEM SOLVING

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Define Algorithm. Summarise the characteristics of a good algorithm.	6 Marks	L1	CO1	PO1
	b)	Explain about sep, end options used in print() with example.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Draw a flowchart for displaying the first n odd numbers.	6 Marks	L3	CO1	PO2
	b)	Evaluate the following expression according to operator precedence 4+int(3.75)+4*3+2**3**3//4.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Define suite and explain about the else suite with for statement.	6 Marks	L2	CO1	PO1
	b)	Write a Python script to find the factorial of a given number	6 Marks	L3	CO1	PO2
		(OR)				
4.	a)	Write a Python script to find the largest number among three numbers and display them in ascending order using if-else construct.	6 Marks	L3	CO1	PO2
	b)	Write a Python script to generate first 'N' Fibonacci numbers. **Note:** The Fibonacci numbers are 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, … where each number is the sum of the preceding two.	6 Marks	L3	CO1	PO2
		UNIT-III				
5.	a)	Develop a python script to print diagonal elements sum in M*M list.	6 Marks	L3	CO1	PO2
	b)	Analyse string slicing. Illustrate how it is done in Python with example.	6 Marks	L2	CO1	PO2
		(OR)				
6.	a)	Define queue. Write a python script to implement queue operations.	6 Marks	L3	CO1	PO3
	b)	Demonstrate with code the various operations that can be performed on tuples.	6 Marks	L2	CO1	PO1
		UNIT-IV				
7.	a)	Write a python script for file reading and writing operations using format operator.	6 Marks	L3	CO2	PO3
	b)	Write a python function to swap the values of two variables.	6 Marks	L3	CO2	PO3
		(OR)				
8.	a)	Write a python script to remove all the occurrences of a given character from a text file, copy the resultant text into another text file. Find the total occurrences of the eliminated characters and display the count along with the contents of the text file on to the console.	6 Marks	L3	CO2	PO3
	b)	Explain functionality of the following functions. i) ones(). ii) arrange(). iii) logspace(). iv) zeros().	6 Marks	L1	CO2	PO1

UNIT-V

9.	a)	Write a python script to concatenate two data frames.	6 Marks	L3	CO2	PO2
	b)	Illustrate usage of loc() and iloc() with an example program.	6 Marks	L2	CO2	PO1
		(OR)				
10.	a)	Draw a scatter plots for knowing the relationship between two numerical variables.	6 Marks	L3	CO2	PO3
	b)	Load data from csv file to data frame and print head() and tail() of a data frame.	6 Marks	L3	CO2	PO2

CODE No.: 19BT1BS01 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

DIFFERENTIAL EQUATIONS AND MULTIVARAIBLE CALCULUS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Find the general solution for the differential equation $(D^2 + 9)\, y = (x + 1)^2$.	6 Marks	L1	CO1	PO1 PO2
	b)	Solve the Legendre's form of linear differential equation $(x+2)^2\, y'' - (x + 2)\, y' + y = 3x + 4$.	6 Marks	L3	CO1	PO1 PO2
		(OR)				
2.		The circuit consists of an inductor of 1H, a resistor of 12Ω, a capacitor of 0.01F, and a generator having voltage given by E(t)=24sin10*t*. Determine the charge q and the current *i* at time *t* if $q=0$ and $i=0$ at $t=0$.	12 Marks	L3	CO1	PO1 PO2

UNIT-II

3.	a)	Solve the partial differential equation $\frac{y^2 z}{x}\, p + xzq = y^2$.	6 Marks	L3	CO1	PO1 PO2
	b)	Find the complete solution of the non-linear partial differential equation $z = p^2 + q^2$.	6 Marks	L1	CO1	PO1
		(OR)				
4.	a)	Solve the homogeneous linear partial differential equation $r - 2s + t = \sin(2x+3y)$.	6 Marks	L3	CO1	PO1 PO2
	b)	Applying method of separation of variables, solve $3\frac{\partial u}{\partial x} + 2\frac{\partial u}{\partial y} = 0$, where $u(x,0) = 4e^{-x}$.	6 Marks	L3	CO1	PO1 PO2

UNIT-III

5.	a)	Show that $\frac{1}{2}\frac{\partial u}{\partial x} + \frac{1}{3}\frac{\partial u}{\partial y} + \frac{1}{4}\frac{\partial u}{\partial z} = 0$, *where* $u = f(2x-3y, 3y-4z, 4z-2x)$.	6 Marks	L2	CO2	PO1
	b)	Examine whether the functions $u = e^x \sin y$, $v = e^x \cos y$ are functionally dependent or not. If so, establish a relation between them.	6 Marks	L4	CO2	PO1 PO2
		(OR)				
6.	a)	Determine maximum and minimum values of the function $\sin x + \sin y + \sin(x+y)$.	6 Marks	L3	CO2	PO1 PO2
	b)	Find the points on the surface $z^2 = xy + 1$ nearest to the origin.	6 Marks	L1	CO2	PO1 PO2

UNIT-IV

7.	a)	Evaluate the double integral $\int_0^4 \int_0^{x^2} e^{\frac{y}{x}} dydx.$	6 Marks	L5	CO2	PO1
	b)	Changing the order of integration, evaluate $\int_0^{4a} \int_{\frac{x^2}{4a}}^{2\sqrt{ax}} dydx.$	6 Marks	L2	CO2	PO1 PO2
		(OR)				
8.	a)	Evaluate the triple integral $\int_0^a \int_0^x \int_0^{x+y} e^{x+y+z}\, dxdydz$.	6 Marks	L5	CO2	PO1
	b)	Evaluate the integral $\int_0^1 \int_0^{\sqrt{1-x^2}} \int_0^{\sqrt{1-x^2-y^2}} \frac{dxdydz}{\sqrt{1-x^2-y^2-z^2}}$ by changing into spherical polar coordinates.	6 Marks	L2	CO2	PO1 PO2

UNIT-V

9.	a)	Find the directional derivative of the function $xy^2 + yz^2 + zx^2$ along the tangent to the curve $x = t,\ y = t^2,\ z = t^3$ at the point (1,1,1).	6 Marks	L1	CO3	PO1
	b)	Find the value of 'n' so that the vector function $r^n . \bar{r}$ is solenoidal.	6 Marks	L1	CO3	PO1
		(OR)				
10.		Verify Stoke's theorem for $\bar{F} = (2x - y)\,\bar{i} - yz^2\,\bar{j} - y^2z\,\bar{k}$ over the upper half surface of the sphere $x^2 + y^2 + z^2 = 1$ bounded by its projection on xy-plane.	12 Marks	L5	CO3	PO1 PO2

CODE No.: 19BT1BS03 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations, June 2022

ENGINEERING PHYSICS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	List the difference between interference and diffraction.	2 Marks	L1	CO1	PO1
	b)	Discuss in detail the Fraunhofer diffraction at a single slit.	10 Marks	L2	CO1	PO1 PO2
		(OR)				
2.	a)	Summarize the theory of Quarter wave plate and Half wave plate	4 Marks	L2	CO2	PO1
	b)	Describe the construction and working of a Nicol's Prism	8 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Discuss the divergence and curl of electric and magnetic fields.	4 Marks	L2	CO2	PO1
	b)	List the Maxwell's equations and derive an expression for the velocity of propagation of plane electromagnetic wave in a medium of dielectric constant ε and permeability μ .	8 Marks	L3	CO2	PO1 PO2
		(OR)				
4.		Define acceptance angle. Derive an expression for acceptance angle and numerical aperture of an optical fiber. Discuss any two losses in optical fibers.	12 Marks	L3	CO2	PO1 PO2
		UNIT-III				
5.		Derive the expression for intrinsic carrier concentration in an intrinsic semiconductor.	12 Marks	L3	CO3	PO2
		(OR)				
6.	a)	Explain construction and working mechanism of a semiconductor diode laser.	10 Marks	L2	CO3	PO1 PO2
	b)	Predict the colour of light emitted by a laser source made up of GaAs with band gap of 1.44 eV.	2 Marks	L3	CO3	PO2
		UNIT-IV				
7.	a)	Outline an expression for internal field of an atom in a dielectric material.	10 Marks	L2	CO4	PO2
	b)	List few applications of dielectrics.	2 Marks	L1	CO4	PO1
		(OR)				
8.	a)	Define the terms magnetic permeability (μ) and magnetic susceptibility (χ)	4 Marks	L1	CO4	PO1
	b)	Construct the B-H curve for a ferromagnetic material and identify the retentivity and the coercive field on the curve.	8 Marks	L3	CO4	PO1 PO2
		UNIT-V				
9.	a)	Describe the effect of temperature, magnetic field and electric current on a superconductor.	9 Marks	L2	CO5	PO2
	b)	Calculate the critical current which can flow through a long thin superconducting wire of diameter 1 mm. The critical magnetic field is 7.9×10^3 A/m.	3 Marks	L3	CO5	PO2
		(OR)				
10.	a)	Define nanomaterials? Why their properties are different from the properties of a bulk material?	8 Marks	L1	CO5	PO1
	b)	List the applications of nanomaterials in various fields.	4 Marks	L1	CO5	PO1

❀ ❀ ❀

CODE No.: 19BT1BS04 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

ENGINEERING CHEMISTRY

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		How does the Shr*ö*dinger's quantum mechanical model helps to determine the location of electrons around the nucleus in atoms?	12 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Describe the structure of H_2O and NH_3 molecule in terms of VSEPR theory. Explain the decrease in bond angle from NH_3 to H_2O.	5 Marks	L2	CO1	PO1 PO2
	b)	Predict the magnetic property of carbon monoxide molecule based on its energy level diagram.	7 Marks	L3	CO1	PO1 PO2
		UNIT-II				
3.		Describe the ion exchange process with a neat diagram. Ion exchange process is more advantageous than zeolite. Why?	12 Marks	L2	CO2	PO1 PO2
		(OR)				
4.	a)	Explain the importance of fluorides in water. Compare the merits and demerits of various methods of defluoridation.	7 Marks	L2	CO2	PO1 PO6
	b)	Define hardness. Calculate the hardness of water sample with 0.5 g of C**a**CO_3 dissolved in dil HCl and the solution was made upto 500 ml with distilled water. 50 mL of the solution required 48 ml of the EDTA solution for the titration. 50 ml of hard water sample required 15 ml of EDTA and after boiling and filtering required 10 ml of the EDTA solution.	5 Marks	L3	CO2	PO1 PO2
		UNIT-III				
5.	a)	Discuss the construction and working of H_2O_2 fuel cell and identify its advantages and limitations.	8 Marks	L2	CO3	PO1 PO2
	b)	Write the working principle of lead acid battery.	4 Marks	L1	CO3	PO1
		(OR)				
6.	a)	Identify two examples where differential aeration effect are seen and explain each with example.	6 Marks	L3	CO3	PO1
	b)	Mention different methods used for prevention of corrosion of metal and discuss any one method.	6 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	State Beer –Lamberts law and discuss various types of electronic transitions.	6 Marks	L2	CO4	PO1
	b)	Write the principle and applications of Transmission Electron Microscope.	6 Marks	L1	CO4	PO1
		(OR)				
8.		Discuss the principle and working of an IR spectrometer with the help of a block diagram.	12 Marks	L2	CO4	PO1 PO5

UNIT-V

9.		Define lubricant. Explain the properties of the lubricant and their significance.	12 Marks	L2	CO5	PO1
		(OR)				
10.	a)	Give the significance of octane number and cetane number and for which these are used. How these can be improved?	6 Marks	L1	CO5	PO1
	b)	Distinguish between solid, liquid and gaseous fuels.	6 Marks	L2	CO5	PO1

CODE No.: 19BT10201 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

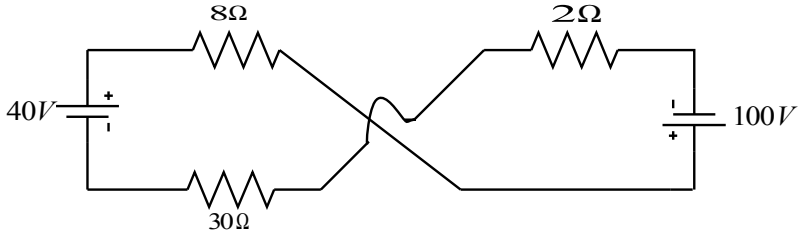
I B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	State and verify Kirchhoff's voltage law for the given circuit. 	6 Marks	L3	CO1	PO2
	b)	Define the following terms and elaborate their importance. i) Real power. ii) Reactive Power. iii) Apparent Power.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	An inductance of 2 mH has a current $i = 5(1-e^{-5000t})$ A. Find the corresponding voltage and the maximum stored energy.	6 Marks	L3	CO1	PO2
	b)	With neat sketch, explain the construction and working of a single loop generator.	6 Marks	L1	CO1	PO1

UNIT-II

3.	a)	With neat sketch, explain the operation of hydro electric power plant.	6 Marks	L1	CO2	PO1
	b)	Demonstrate the working principle of MCB with suitable illustrations.	4 Marks	L1	CO2	PO1
	c)	Explain the significance of BEE standards.	2 Marks	L1	CO2	PO1
		(OR)				
4.	a)	With neat sketch explain the operation of an inverter.	6 Marks	L1	CO2	PO1
	b)	Mention the disadvantages of low power factor and suggest suitable methods to improve the power factor.	6 Marks	L2	CO2	PO1

UNIT-III

5.	a)	With neat sketch, demonstrate the working principle of single phase transformer.	6 Marks	L1	CO3	PO1
	b)	Explain the constructional details of 3-ph induction motor and mention its applications.	6 Marks	L1	CO3	PO5
		(OR)				
6.	a)	Explain the constructional details and working of single phase resistor start induction motor.	6 Marks	L1	CO3	PO1
	b)	Explain the working of synchronous machine and mention it's applications.	6 Marks	L1	CO3	PO5

UNIT-IV

7.		Draw the circuit of a full-wave rectifier without filter and derive the expressions for ripple factor, % regulation, efficiency and PIV.	12 Marks	L1	CO4	PO2

(OR)

8.	a)	Distinguish between Avalanche and Zener break downs.	6 Marks	L2	CO4	PO2
	b)	Explain the input and output characteristic of a transistor in common emitter configuration.	6 Marks	L1	CO4	PO1

UNIT-V

9.	a)	Discuss in detail about level translator and its significance in the circuits.	6 Marks	L1	CO5	PO1
	b)	Construct a circuit to realize $V=V_1-V_2+V_3$ using Op-amp.	6 Marks	L3	CO5	PO3

(OR)

10.	a)	Explain the working of a comparator using Op-amp and enumerate its limitations.	6 Marks	L1	CO5	PO1
	b)	Derive an expression for V_0 of the integrator circuit by using Op-amp.	6 Marks	L2	CO5	PO2

CODE No.: 19BT10501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

PROGRAMMING FOR PROBLEM SOLVING

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define algorithm, explain properties of an algorithm.	6 Marks	L1	CO1	PO1
	b)	Evaluate the following expression according to operator precedence 3+int(2.96)+4*2+3**2**2//3.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Draw a flow chart to reverse a given number.	6 Marks	L3	CO1	PO2
	b)	Explain about sep, end options used in print() with example.	6 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Define suite and explain about the else suite with for statement.	6 Marks	L2	CO1	PO1
	b)	Display the following pattern using python script. 1 12 123 1234 12345	6 Marks	L3	CO1	PO2
		(OR)				
4.	a)	Write a python script to find the largest number among three numbers and display them in ascending order using if-else construct.	6 Marks	L3	CO1	PO2
	b)	Develop a python script to print factors for a given integer number.	6 Marks	L3	CO1	PO2

UNIT-III

5.	a)	Develop a python script to print diagonal elements sum in M*M list.	6 Marks	L3	CO1	PO2
	b)	List any four string handling methods used in Python. Illustrate with an example program.	6 Marks	L3	CO1	PO2
		(OR)				
6.	a)	Define stack. Write a python script to implement stack operations.	6 Marks	L3	CO1	PO3
	b)	Specify the functionalities of the following functions. i) keys() ii) values() iii) items() iv) update()	6 Marks	L2	CO1	PO1

UNIT-IV

7.	a)	Develop a python script to implement Tower of Hanoi problem.	6 Marks	L3	CO2	PO3
	b)	Write a python script to remove all the occurrences of a given character from a text file, copy the resultant text into another text file. Find the total occurrences of the eliminated characters and display the count along with the contents of the text file on to the console.	6 Marks	L3	CO2	PO3
		(OR)				

8.	a)	Write a Python script that reads a line of integers, and then displays each integer, and the sum of all the integers.	6 Marks	L3	CO2	PO3
	b)	Explain functionality of the following functions. i) ones() ii) arrange() iii) logspace() iv) zeros()	6 Marks	L1	CO2	PO1

UNIT-V

9.	a)	Write a python script to concatenate two data frames.	6 Marks	L3	CO2	PO2
	b)	Illustrate usage of loc() and iloc() with an example program.	6 Marks	L2	CO2	PO1
		(OR)				
10.	a)	Draw a scatter plots for knowing the relationship between two numerical variables.	6 Marks	L3	CO2	PO3
	b)	Load data from csv file to data frame and print head() and tail() of a data frame.	6 Marks	L3	CO2	PO2

CODE No.: 20BT1BS01 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Regular Examinations April – 2022

DIFFERENTIAL EQUATIONS AND MULTIVARIABLE CALCULUS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Science), Computer Science and Business Systems, Computer Science and Design, Computer Science and Engineering (Artificial Intelligence and Machine Learning), Computer Science and Engineering (Internet of Things), Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Solve the differential equation $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + 2y = 3e^x \cos 2x.$	7 Marks	L3	CO1	PO1
	b)	Solve the following differential equation by the method of variation of parameters $\frac{d^2y}{dx^2} - 3\frac{dy}{dx} + 2y = e^{3x}$.	7 Marks	L3	CO1	PO2
		(OR)				
2.		Determine the charge and current on the capacitor in an *LRC* series circuit at t when *inductance* 1 H, *resistance* 10Ω, *capacitance* 0.04 F, $E(t) = \cos 3tV$, where $q(0)$ = 5 C, and $i(0)$ = 0 A.	14 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Construct the partial differential equation of all spheres whose Centre lie on Z-axis and given by Equation, $x^2 + y^2 + (z-a)^2 = b^2$ where **a** and **b** being constants.	7 Marks	L3	CO2	PO1
	b)	Obtain the solution of partial differential equation $x(y-z)p + y(z-x)q = z(x-y)$ using Lagrange's method.	7 Marks	L3	CO2	PO2
		(OR)				
4.	a)	Using method of Separation of variables, find the solution of the partial differential equation $\frac{\partial u}{\partial x} = 4\frac{\partial u}{\partial y}$ *given that* $u(x,0) = 8e^{-3x}$.	7 Marks	L3	CO2	PO1
	b)	Solve the linear homogeneous partial differential equation $\frac{\partial^2 z}{\partial x^2} - \frac{\partial^2 z}{\partial x \partial y} = A\cos x \cos 2y.$	7 Marks	L3	CO2	PO2

UNIT-III

5.	a)	If $u = \sqrt{(1-y^2)} + \sqrt{(1-x^2)}$, $v = \sin^{-1}x + \sin^{-1}y$ then verify that **u** and ***v*** are functionally dependent or not.	7 Marks	L3	CO3	PO1
	b)	Applying Lagrange's undetermined multipliers to find the maximum value for $x^2 + y^2 + z^2$ subject to the condition $lx + my + nz = p$.	7 Marks	L3	CO3	PO1
		(OR)				
6.	a)	If $u = x^2 - 2y$, $v = x + y + z$, $w = x - 2y + 3z$. Determine $J\left(\frac{u,v,w}{x,y,z}\right)$.	7 Marks	L3	CO3	PO1
	b)	Apply partial derivatives to find the stationary points for the function $f(x,y) = x^2 + y^2 + 6x + 12$ and estimate at what points the function has maximum and minimum values.	7 Marks	L3	CO3	PO2

UNIT-IV

7.	a)	Evaluate $\int\int xy\,dx\,dy$ where R is the region lies in the positive quadrant of the circle $x^2 + y^2 = a^2$.	7 Marks	L5	CO4	PO2
	b)	Evaluate $\int_0^a \int_0^x \int_1^{x+y} e^{x+y+z}\,dx\,dy\,dz$.	7 Marks	L5	CO4	PO1
		(OR)				
8.	a)	Change the order of integration and hence evaluate $\int_0^{4a} \int_{x^2/4a}^{2\sqrt{ax}} dy\,dx$.	7 Marks	L4	CO4	PO1
	b)	Evaluate the integral $\int_0^4 \int_0^{\sqrt{4y-y^2}} x^2\,dx\,dy$ by converting to polar coordinates.	7 Marks	L5	CO4	PO2

UNIT-V

9.	a)	If, f = (2x+3y+az) **i**+ (bx+2y+3z) **j**+(2x+cy+3z) **k** is irrotational, find a, b, c.	7 Marks	L1	CO5	PO1
	b)	Determine the directional derivative of $\phi = xy + yz + zx$ at A in the direction of line AB where A= (1, 2, -1), B= (1, 2, 3).	7 Marks	L3	CO5	PO1
		(OR)				
10.		Verify Stoke's theorem to evaluate $\int_C \overline{F}.\,\overline{dr}$ where $\vec{F} = (x^2 + y^2)\vec{i} - 2xy\vec{j}$, where C is the boundary of the rectangle bounded by the lines x = ± a, y = 0, y = b.	14 Marks	L5	CO5	PO2

CODE No.: 20BT1BS02 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Regular Examinations April – 2022

ENGINEERING CHEMISTRY

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering, Computer Science and Design, Computer Science and Engineering (Internet of Things), Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Central Water Commission (CWC) of Tirupati section reports on underground water sample (in mg/L) at the proposed site for the construction of thermal power plant (300 MW) near Vijayawada is as follows: $Ca(HCO_3)_2$ = 220, $MgCl_2$ = 130, $CaSO_4$= 98, $Mg(HCO_3)_2$ = 56, $MgSO_4$ = 84, DO = 8 and Na_2CO_3 = 22. Discuss in detail the operational troubles suffer by the boiler if above sample of water is to be fed into 56.24 x 104 kg m^{-2} boiler.	10 Marks	L3	CO1	PO1 PO6
	b)	Explain the reasons for the formation of scales in boilers. Mention any three disadvantages of scales.	4 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Describe the principle, chemistry, and process of determination of hardness of a water sample by EDTA method.	8 Marks	L2	CO1	PO1
	b)	What are zeolites? Explain the zeolite process with relevant equations and mention the advantages and disadvantages of zeolite process.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Derive Schrodinger wave equation and explain the significance of ψ and ψ^2.	7 Marks	L2	CO2	PO1
	b)	Explain Quantum mechanical model of Hydrogen atom.	7 Marks	L2	CO2	PO1 PO2
		(OR)				
4.		Illustrate how the energies of a particle in a potential box are quantized.	14 Marks	L2	CO2	PO1
		UNIT-III				
5.	a)	Describe electroplating. Apply the electroplating process to coat nickel over metal object and explain the chemistry taking place.	8 Marks	L3	CO3	PO1 PO2
	b)	Explain the chemistry involved in concentration cell corrosion.	6 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Describe fuel cells and their significance. Explain the working, chemistry involved and applications of solid oxide fuel cell.	8 Marks	L2	CO3	PO1
	b)	What is reference electrode? Explain the construction, working and applications of calomel electrode.	6 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	Demonstrate the principle, working and applications of IR spectrometer with a neat diagram.	8 Marks	L3	CO4	PO5
	b)	Explain different types of fundamental modes of vibrations.	6 Marks	L2	CO4	PO1

(OR)

8.		Discuss the principle and working of UV - Visible spectrometer with the help of a block diagram.	14 Marks	L2	CO4	PO1

UNIT-V

9.	a)	Interpret the functions of lubricants and discuss the mechanism involved in lubrication process.	8 Marks	L2	CO5	PO1
	b)	Classify various types of fuels with suitable examples.	6 Marks	L2	CO5	PO1

(OR)

10.	a)	Describe the cracking of petroleum. Explain how gasoline can be obtained making use of various catalytic cracking methods.	8 Marks	L2	CO5	PO1
	b)	Calculate the HCV and LCV of coal having the following compositions: carbon = 80%, hydrogen = 10%, nitrogen = 4%, Sulphur = 2%, ash = 4%, latent heat of steam = 587 kcal/kg.	6 Marks	L3	CO5	PO1

CODE No.: 20BT1BS03 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Regular Examinations April – 2022

ENGINEERING PHYSICS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering, Computer Science and Engineering (Data Science), Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Artificial Intelligence and Machine Learning)]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Obtain the conditions for constructive and destructive interference in case of a thin parallel film observed in reflected light.	10 Marks	L3	CO1	PO2
	b)	A thin parallel film of refractive index 1.4 is illuminated with white light. Two consecutive dark bands are observed corresponding to wavelengths 459 nm and 450 nm when observed at an angle of 35^0. Determine the thickness of the film.	4 Marks	L1	CO1	PO2
		(OR)				
2.	a)	Discuss the Fraunhofer diffraction at a single slit. Explain the condition for principle maximum and minimum.	10 Marks	L2	CO1	PO1
	b)	Distinguish between interference and diffraction.	4 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Write the Maxwell equations in integral and differential form. Explain their physical significance.	8 Marks	L2	CO2	PO2
	b)	Explain the electromagnetic wave propagation through non conducting medium.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Define acceptance angle and numerical aperture of an optical fiber. Derive the expression for numerical aperture of an optical fiber.	10 Marks	L3	CO2	PO2
	b)	The numerical aperture of an optical fiber is 0.4. Refractive index of the core is 1.47. Determine the refractive index of the cladding.	4 Marks	L1	CO2	PO2
		UNIT-III				
5.		What are drift and diffusion currents? Derive the expressions for it.	14 Marks	L3	CO3	PO2
		(OR)				
6.	a)	Describe the semi conductor diode laser.	10 Marks	L3	CO3	PO2
	b)	Distinguish between direct and indirect band gap semiconductors.	4 Marks	L1	CO3	PO1
		UNIT-IV				
7.	a)	What is Lorentz field? Derive an expression for Lorentz field acting at the centre of the Lorentz cavity.	10 Marks	L3	CO4	PO2
	b)	What is electronic polarization and ionic polarization?	4 Marks	L1	CO4	PO1
		(OR)				
8.	a)	Distinguish between dia, para and ferro magnetic materials.	10 Marks	L1	CO4	PO1
	b)	What are soft and hard magnetic materials?	4 Marks	L2	CO4	PO1

UNIT-V

9.	a)	State and explain Meissner effect.	7 Marks	L1	CO5	PO1
	b)	Explain DC and AC Josephson effects.	7 Marks	L1	CO5	PO2
		(OR)				
10.	a)	Describe ball milling technique to synthesize nanomaterials.	7 Marks	L2	CO5	PO1
	b)	What are nanomaterials? Write its properties.	7 Marks	L1	CO5	PO1

CODE No.: 20BT1BS04 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Regular Examinations April – 2022

APPLIED PHYSICS

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What is the principle involved in optical fiber? Define it.	2 Marks	L1	CO1	PO1
	b)	Explain, how the optical fibers are classified.	12 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Write a note on optical fiber sensors.	7 Marks	L1	CO1	PO1
	b)	Explain the propagation of light through an optical fiber.	7 Marks	L1	CO1	PO1

UNIT-II

3.	a)	State and explain Sabine's formula for reverberation time.	6 Marks	L1	CO2	PO1
	b)	Define reverberation time and explain its significance.	8 Marks	L1	CO2	PO1
		(OR)				
4.	a)	Explain the production of ultrasonic waves with a neat sketch.	10 Marks	L2	CO2	PO1
	b)	Calculate the frequency of fundamental note emitted by a piezo-electric crystal with the following data: Vibrating length = 3mm; $Y = 8 \times 10^{10}$ Nm^{-2}; density of the crystal = 2.5×10^{3} kg/m^{3}.	4 Marks	L1	CO2	PO2

UNIT-III

5.		Derive the expressions for maximum height, time of flight and horizontal range in case of inclined projection.	14 Marks	L3	CO3	PO1
		(OR)				
6.	a)	Derive an expression for work-energy in case of translation motion.	10 Marks	L3	CO3	PO2
	b)	Briefly explain rectilinear translation.	4 Marks	L1	CO3	PO1

UNIT-IV

7.	a)	Briefly explain various modes of heat transfer with examples.	8 Marks	L2	CO4	PO1
	b)	Write a note on coefficient of thermal conductivity.	6 Marks	L1	CO4	PO1
		(OR)				
8.	a)	Develop an expression for thermal conductivity of materials connected in parallel.	7 Marks	L3	CO4	PO2
	b)	Develop an expression for thermal conductivity of materials connected in series.	7 Marks	L3	CO4	PO2

UNIT-V

9.	a)	Briefly explain the properties of metallic glasses.	10 Marks	L2	CO5	PO1
	b)	Write some applications of metallic glasses.	4 Marks	L1	CO5	PO1
		(OR)				
10.	a)	What are shape memory alloys? Classify them.	8 Marks	L1	CO5	PO2
	b)	Outline the applications of shape memory alloys.	6 Marks	L1	CO5	PO1

CODE No.: 20BT1HS01 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Regular Examinations April – 2022

COMMUNICATIVE ENGLISH

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering, Computer Science and Engineering (Data Science), Computer Science and Engineering (Artificial Intelligence), Computer Science and Business Systems, Computer Science and Engineering (Cyber Security), Computer Science and Engineering (Artificial Intelligence and Machine Learning)

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Write about proxemics of non verbal communication skills.	7 Marks	L2	CO1	PO1
	b)	Discuss the merits and demerits of Assertive communication with suitable examples.	7 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Distinguish between formal and informal communication with relevant examples.	7 Marks	L2	CO1	PO1
	b)	Explain briefly about the organizational barriers of communication.	7 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Explain the following with examples: i) Appreciative Listening. ii) Empathetic Listening.	7 Marks	L2	CO2	PO2
	b)	What are the traits of a good listener?	7 Marks	L2	CO2	PO2
		(OR)				
4.	a)	Explain the barriers of effective listening.	7 Marks	L2	CO2	PO2
	b)	Write a brief note on listening for specific information.	7 Marks	L2	CO2	PO2
		UNIT-III				
5.	a)	Define task based speaking. Explain any five situations you need task based speaking.	7 Marks	L1	CO2	PO2
	b)	What is public speaking? Explain the strategies of effective presentation.	7 Marks	L1	CO2	PO1
		(OR)				
6.	a)	What is persuasive speaking? Write the characteristic features of persuasive speaking.	7 Marks	L2	CO2	PO2
	b)	Define symposium. Write the differences between conference and symposium.	7 Marks	L2	CO2	PO1
		UNIT-IV				
7.	a)	Write a brief note on: i) Intensive reading. ii) Extensive reading.	7 Marks	L1	CO3	PO1
	b)	Explain the seven strategies for reading comprehension questions.	7 Marks	L2	CO3	PO1
		(OR)				
8.	a)	Explain SQ3R technique in reading.	7 Marks	L2	CO3	PO2
	b)	Distinguish between skimming and scanning.	7 Marks	L2	CO3	PO2

UNIT-V

9.	a)	Write the steps we follow while writing an essay.	7 Marks	L2	CO3	PO2
	b)	Discuss the ways on how to overcome writer's block.	7 Marks	L2	CO3	PO1
		(OR)				
10.	a)	Explain the steps to effective précis writing.	7 Marks	L2	CO3	PO1
	b)	Clarify the concept of technical writing distinguished it from other kinds of writing.	7 Marks	L2	CO3	PO2

CODE No.: 20BT10101 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Regular Examinations April – 2022

ENGINEERING MECHANICS

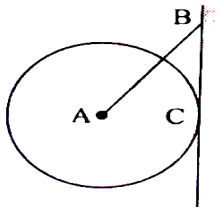
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

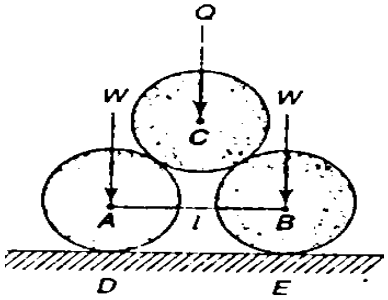
UNIT-I

1.	a)	State and prove Varignon's theorem.	7 Marks	L2	CO1	PO1
	b)	A sphere of radius ***5 cm***, and of weight ***100 N*** is supported on a smooth wall by a tie rod of ***length 13 cm***, as shown in figure. Find the tension in the tie rod and reaction at point of contact C.	7 Marks	L3	CO1	PO4



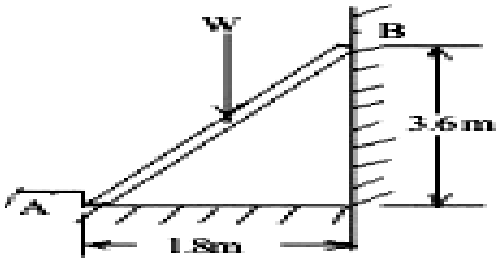
(OR)

2.		Two smooth circular cylinders, each of weight ***W = 445 N***, and radius ***r =152 mm*** are connected at their centres by a string AB of length ***l = 406 mm*** and rest up on a horizontal plane, supporting above them a third cylinder of weight ***Q = 890 N*** and radius ***r = 152 mm*** as shown in figure. Find the force in the string and reactions induced at the points of contact D and E.	14 Marks	L4	CO1	PO5



UNIT-II

3.	a)	Explain the following: i) Co-efficient of friction. ii) Angle of friction. iii) Angle of repose. iv) Cone of friction.	7 Marks	L1	CO2	PO1
	b)	A 750 N man stands on the middle rung of a 250N ladder as shown in figure. Assuming a smooth wall at B and stop at A to prevent slipping, find the reactions at A and B.	7 Marks	L3	CO2	PO4



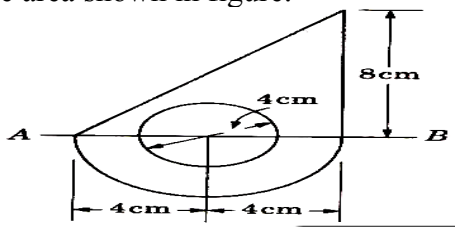
(OR)

4.		A 7 meter long ladder rests against a vertical wall, with which it makes an angle of 45^0, and on floor. If a man, whose weight is one of half of that of the ladder, climbs it, at what distance along the ladder will he be, when the ladder is about to slip ? The coefficient of friction between wall and ladder is 0.3 and that between ladder and the floor is 0.5.	14 Marks	L4	CO2	PO6

UNIT-III

5.	a)	Determine centroid of area of semi-circle of radius 'R'.	7 Marks	L2	CO3	PO2
	b)	State and prove parallel axis theorem.	7 Marks	L2	CO3	PO2

(OR)

6.		A Find the moment of inertia about the centriodal axis parallel to AB of the plane area shown in figure. 	14 Marks	L3	CO3	PO5

UNIT-IV

7.	a)	Draw the stress strain diagram of a structural steel, explain various stages in detail.	7 Marks	L2	CO4	PO1
	b)	Derive the relation between the three elastic constants.	7 Marks	L2	CO4	PO2

(OR)

8.	a)	A round bar of 10 mm diameter is made of aluminum alloy with modulus of elasticity, 72 GPa. When the bar is stretched by axial forces P, its diameter decreases by 0.016mm. Find the magnitude of the load P.	7 Marks	L3	CO4	PO2
	b)	The following data refer to a mild steel specimen tested in a laboratory: Diameter of the specimen = 30 mm Length of the specimen = 250 mm Extension under a load of 15 kN = 0.055 mm Load at yield point = 125 kN Maximum load = 240 kN Length of the specimen after failure = 410 mm Neck diameter = 18 mm. Determine: i) Young's modulus. ii) Yield point. iii) Ultimate stress. iv) Percentage of elongation. v) Percentage reduction in area. vi) Safe stress adopting a factor of safety of 2.	7 Marks	L3	CO4	PO4

UNIT-V

9.	a)	Distinguish between: i) Thin cylinder and thick cylinder. ii) Hoop and longitudinal stress.	7 Marks	L2	CO5	PO2
	b)	A storage tank of internal diameter 280 mm is subjected to an internal pressure of 2.56 MPa. Find the thickness of the tank, if the hoop and longitudinal stress are 75 MPa and 45 MPa respectively.	7 Marks	L3	CO5	PO2

(OR)

10.		A shell 3.25 mm long and 1 m diameter, subjected to an internal pressure of 1.2 N/m². If the thickness of the shell is 10 mm determine the change in volume, find the circumferential and longitudinal stresses. Find also the maximum shear stress and changes in dimensions of the shell. Take E=200kN/m² and Poisson's ratio=0.3.	14 Marks	L4	CO5	PO4

CODE No.: 20BT10201 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Regular Examinations April – 2022

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

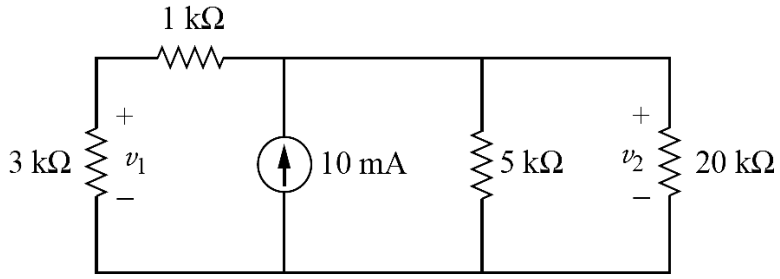
[Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering, Computer Science and Engineering (Data Science), Computer Science and Engineering (Artificial Intelligence), Computer Science and Design, Computer Science and Engineering (Cyber Security), Computer Science and Engineering (Artificial Intelligence and Machine Learning), Computer Science and Engineering (Internet of Things)]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

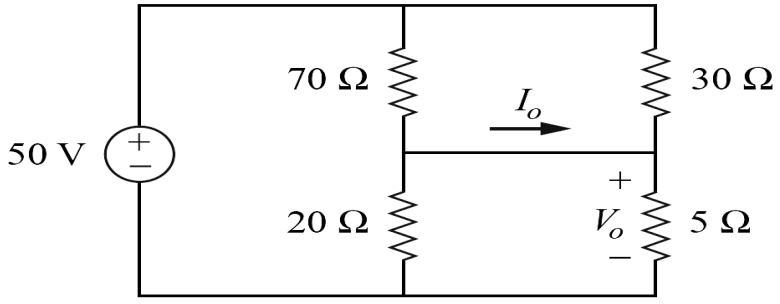
UNIT-I

1.	a)	Differentiate single phases and three phase supply with respect to advantages and disadvantages.	7 Marks	L2	CO1	PO2
	b)	For the circuit shown in fig., apply Kirchhoff's current law determine v_1 and v_2.	7 Marks	L3	CO1	PO1



(OR)

2.	a)	Explain the concepts of real, reactive powers.	6 Marks	L2	CO1	PO1
	b)	Compute V_o and I_o.	8 Marks	L3	CO1	PO2



UNIT-II

3.	a)	Draw the layout of Thermal power plant and briefly explain the function of major components.	7 Marks	L2	CO2	PO1
	b)	Explain the working of fuse and circuit breaker with necessary diagrams.	7 Marks	L1	CO2	PO8

(OR)

4.	a)	"Solar is the best option for future power requirements" – comment on it.	6 Marks	L3	CO2	PO1
	b)	What is the role of relay in electrical systems and how it works?	8 Marks	L1	CO2	PO7

UNIT-III

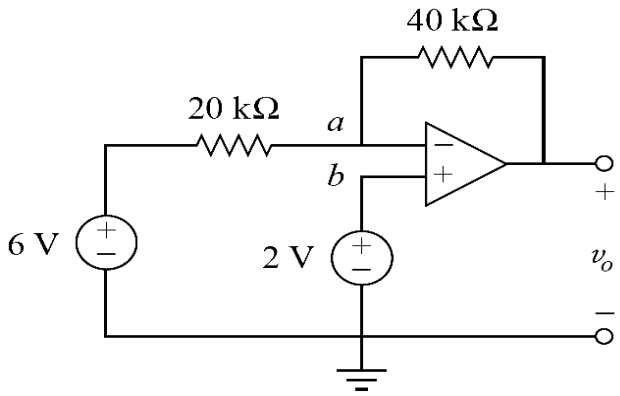
5.	a)	Describe the role of transformers in power transmission.	5 Marks	L3	CO3	PO1
	b)	Explain the working of permanent magnet DC motors.	6 Marks	L2	CO3	PO1
	c)	List the applications of stepper motors.	3 Marks	L1	CO3	PO6
		(OR)				
6.	a)	Derive expression for induced **emf** in a single phase transformer.	6 Marks	L3	CO3	PO1
	b)	Illustrate the constructional differences between permanent magnet DC motors and DC brushless motors.	8 Marks	L2	CO3	PO1

UNIT-IV

7.	a)	What is the difference between PN junction diode and zener diode? Explain Zener diode characteristics.	7 Marks	L1	CO4	PO1
	b)	Explain the need for biasing circuits for transistors. What are the different types of biasing circuits used for transistors represent their circuit diagrams?	7 Marks	L2	CO4	PO2
		(OR)				
8.	a)	Draw the circuit diagram of half wave rectifier and explain its operation with necessary wave forms.	7 Marks	L2	CO4	PO1
	b)	Design a circuit with zener diode to act as a voltage regulator. List the applications where constant voltage needed.	7 Marks	L3	CO4	PO1

UNIT-V

9.	a)	Explain op amp AC and DC characteristics.	7 Marks	L1	CO4	PO6
	b)	Explain inverting amplifier with op amp circuit diagram.	7 Marks	L1	CO4	PO7
		(OR)				
10.	a)	Determine v_o in the op amp circuit shown in Fig.	7 Marks	L3	CO4	PO1



	b)	Explain circuit design and working of differential operational amplifier with necessary voltage equations.	7 Marks	L2	CO4	PO2

CODE No.: 20BT10301 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Regular Examinations April – 2022

MATERIALS SCIENCE AND ENGINEERING

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain and differentiate Edge dislocation and Screw dislocation with a neat sketch.	7 Marks	L2	CO1	PO1 PO2
	b)	Explain the principle of bond formation in solids, with a suitable example.	7 Marks	L2	CO1	PO1 PO2
		(OR)				
2.		Draw a Fe-Fe_3C phase diagram and label all the phases. Discuss the structural transformation while cooling from liquid to solid.	14 Marks	L2	CO2	PO1 PO2
		UNIT-II				
3.	a)	Discuss the importance of heat treatment. Explain the important methods of heat treatment of steels.	7 Marks	L2	CO2	PO1 PO3
	b)	What is hardenability? Explain the Jominy end quench test used for determining the hardenability of steels.	7 Marks	L2	CO2	PO1 PO2
		(OR)				
4.	a)	Discuss the method of constructing isothermal diagrams.	7 Marks	L2	CO2	PO1 PO2
	b)	Draw a T-T-T diagram for hypo eutectoid steels. Write characteristics of Bainaite and Martensite.	7 Marks	L2	CO2	PO1 PO2
		UNIT-III				
5.	a)	Discuss the composition, properties, and application of the following cast Iron. i) Malleable cast Iron. ii) Spheroidal cast Iron.	10 Marks	L3	CO3	PO1 PO2 PO3
	b)	Give a note on Tool steels.	4 Marks	L2	CO3	PO1 PO2
		(OR)				
6.	a)	Explain the effect of alloy elements of Steel.	7 Marks	L2	CO3	PO1 PO2
	b)	State the properties and applications of Plain carbon steels.	7 Marks	L2	CO3	PO1 PO2
		UNIT-IV				
7.		Write a short note on light weight non-ferrous alloys and discuss the Magnesium and its alloys with respect to alloying and heat treatment.	14 Marks	L2	CO4	PO1 PO2
		(OR)				
8.		Enumerate the composition and applications of the following alloys. i) Cupro nickel. ii) Bronze. iii) Bearing alloy.	14 Marks	L2	CO4	PO1 PO3

UNIT-V

9.	a)	Classify Engineering ceramics and list properties and applications of any Two of them.	7 Marks	L2	CO5	PO1 PO2
	b)	Explain the following terms with respect to polymers. i) Mechanical behavior. ii) Thermal behavior.	7 Marks	L2	CO5	PO1 PO2
		(OR)				
10.	a)	List two applications of composites. Differentiate between particle reinforced and fiber-reinforce composites.	7 Marks	L2	CO5	PO1 PO2
	b)	What are the special properties of plastics that make them suitable for engineering applications?	7 Marks	L2	CO5	PO1 PO3

CODE No.: 20BT10341 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Regular Examinations April – 2022

BASIC CIVIL AND MECHANICAL ENGINEERING

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		Discuss the classifications of surveying based on: i) Instruments used. ii) Objectives of survey. iii) Methods employed.	14 Marks	L2	CO1	PO1 PO8
		(OR)				
2.	a)	Discuss the geological and physical classification of rocks.	6 Marks	L2	CO1	PO1 PO5
	b)	Define Composite materials. List out various applications, advantages and limitations of composites.	8 Marks	L1	CO1	PO9
		UNIT-II				
3.	a)	What is foundation? State the requirements of a good foundation.	7 Marks	L1	CO2	PO1
	b)	Briefly describe various types of stairs.	7 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Mention different types of roofs and explain briefly.	7 Marks	L3	CO2	PO1 PO8
	b)	Compare merits and demerits of flat and pitched roofs.	7 Marks	L2	CO2	PO1
		UNIT-III				
5.		Discuss the working principle of single acting reciprocating pump with the help of neat sketch.	14 Marks	L2	CO3	PO1 PO5
		(OR)				
6.	a)	List out major parts of an IC engine. Explain any four of them in detail.	8 Marks	L1	CO3	PO1
	b)	Write short notes on specialized sub-disciplines in Mechanical Engineering.	6 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	Explain centrifugal tension and initial tension in belt drives.	7 Marks	L2	CO3	PO1
	b)	Write the advantages and disadvantages of rope drives.	7 Marks	L2	CO3	PO1
		(OR)				
8.	a)	Write the expression for the power transmitted by the belts.	7 Marks	L2	CO3	PO1
	b)	Name different types of belt drives. Explain any two belt drives with neat sketches.	7 Marks	L4	CO3	PO1 PO8
		UNIT-V				
9.	a)	Define welding. Explain the working principle and operation of Arc welding.	8 Marks	L2	CO4	PO1
	b)	Explain how forging improves the mechanical properties of components with neat sketch.	6 Marks	L4	CO4	PO1 PO8
		(OR)				

10.	a)	Discuss the merits and demerits of casting over other manufacturing methods. Summarize the factors influencing the quality of finished casting.	10 Marks	L2	CO4	PO1
	b)	List out various operations that can be carried out on Lathe.	4 Marks	L1	CO4	PO1 PO8

CODE No.: 20BT11201 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Regular Examinations April – 2022

PROGRAMMING FOR PROBLEM SOLVING

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering, Computer Science and Engineering (Data Science), Computer Science and Engineering (Artificial Intelligence), Computer Science and Business Systems, Computer Science and Design, Computer Science and Engineering (Cyber Security), Computer Science and Engineering (Artificial Intelligence and Machine Learning), Computer Science and Engineering (Internet of Things)]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Write an algorithm, flowchart and C program to find the sum of numbers from '1 to n'.	7 Marks	L1	CO1	PO1
	b)	What is variable? Give the rules for variable declaration.	7 Marks	L2	CO1	PO1
		(OR)				
2.	a)	What are basic data types available in "C"? Write the significance of each data type.	7 Marks	L1	CO1	PO2
	b)	What is an expression? Evaluate the following expressions. i) 100 % 20 < = 20 – 5 + 100 % 10 – 20 = = 5 > = 1 != 20 ii) a + = b * = C - = 5 where a=3 b=5 and c=8.	7 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	Explain about the working procedure of if–else ladder. Write a C program to display the largest of 3 integers using if-else ladder.	7 Marks	L2	CO1	PO1
	b)	Define an algorithm. Illustrate the implementation of algorithm with an example.	7 Marks	L2	CO2	PO3
		(OR)				
4.	a)	Define algorithm. Design an algorithm to check whether a number given by the user is positive or negative or zero.	7 Marks	L2	CO2	PO3
	b)	Explain the program verification for solving any given problem.	7 Marks	L2	CO2	PO5
		UNIT-III				
5.	a)	What is string? Write a C program that reads a sentence and prints the frequency of each of the vowels and total count of consonants.	7 Marks	L1	CO3	PO2
	b)	Write a program to find GCD and LCM of two numbers using concept of functions.	7 Marks	L3	CO3	PO3
		(OR)				
6.	a)	Write a program in C using functions to swap two numbers using global variables concept and call by reference concept.	7 Marks	L1	CO3	PO3
	b)	What is array? Explain the declaration and initialization of one dimensional and two dimensional array with an example.	7 Marks	L3	CO3	PO2
		UNIT-IV				
7.	a)	What is pointer? Explain how the pointer variable declared and initialized.	7 Marks	L2	CO4	PO2
	b)	Write a C program to read and display multiple strings using pointers.	7 Marks	L3	CO4	PO3

(OR)

8.	a)	Explain the concept of functions returning pointers with example.	7 Marks	L2	CO4	PO1
	b)	Write a C program to show that pointer of any data type occupies same space.	7 Marks	L3	CO4	PO3

UNIT-V

9.	a)	Explain the difference between array and structures with suitable example.	7 Marks	L1	CO5	PO1
	b)	Write a program to maintain a record of "n" employee detail using an array of structures with three fields (id, name, salary) and print the details of employees whose salary is above 10000.	7 Marks	L3	CO5	PO3

(OR)

10.	a)	List out the differences between unions, structures and arrays.	7 Marks	L1	CO5	PO2
	b)	Write a C program to count number of characters, spaces, lines, words of a file.	7 Marks	L3	CO5	PO3

CODE No.: 20BT12901 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Regular Examinations April – 2022

DISCRETE MATHEMATICAL STRUCTURES

[Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Show that: $P \vee (\sim P \wedge Q) \Leftrightarrow (P \vee Q)$.	7 Marks	L2	CO1	PO1
	b)	Show that $S \vee R$ is tautologicaly implied by $(P \vee Q) \wedge (P \rightarrow R) \wedge (Q \rightarrow S)$.	7 Marks	L3	CO1	PO1
		(OR)				
2.	a)	Prove (or) Disprove the validity of the following argument. Every living thing is a Plant or animal. Davids dog is alive and it is not a plant. All animals have hearts. Hence, David's dog has a heart.	7 Marks	L3	CO1	PO1
	b)	Show that $(x)(P(x) \vee Q(x)) \Rightarrow (x)P(x) \vee (\exists x)Q(x)$.	7 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Define POSET? Draw a POSET or Hasse diagram for the POSET **[D_1:|]** and determine all maximal and minimal elements and greatest and least elements if they exist. Specify the [**D_{12}:|]** POSET is lattice or not.	7 Marks	L4	CO3	PO2
	b)	What is a Equivalence relation? Let X={1,2,3,4} and R={(1,1), (1,4), (4,1), (4,4), (2,2), (2,3), (3,2),(3,3)}. Determine whether the relation R is equivalence or not and sketch its graph and find equivalence classes.	7 Marks	L3	CO2	PO2
		(OR)				
4.	a)	What is meant by a lattice? Check whether [D_{30}, |] is a lattice or not.	7 Marks	L4	CO3	PO2
	b)	Given $f(x)=x^3+1$, $g(x)=x^2$. Find $f^{-1}(x)$, $g^{-1}(x)$, fog(x).	7 Marks	L2	CO2	PO2

UNIT-III

5.	a)	Justify Whether given set 'S'. S={0,1,2,3,4,5} can be semi-group under binary operation $+_5$, i.e additive modulo 5.	7 Marks	L3	CO3	PO2
	b)	Show that in a group (G, .), if $(a.b)^2 = a^2 . b^2$ $\forall a,b \in G$ then (G, .) is abelian.	7 Marks	L3	CO3	PO2
		(OR)				
6.	a)	State and Prove Lagranges theorem.	7 Marks	L2	CO3	PO2
	b)	Define Monoid and Group. Give an example of Monoid which is not a group.	7 Marks	L2	CO3	PO2

UNIT-IV

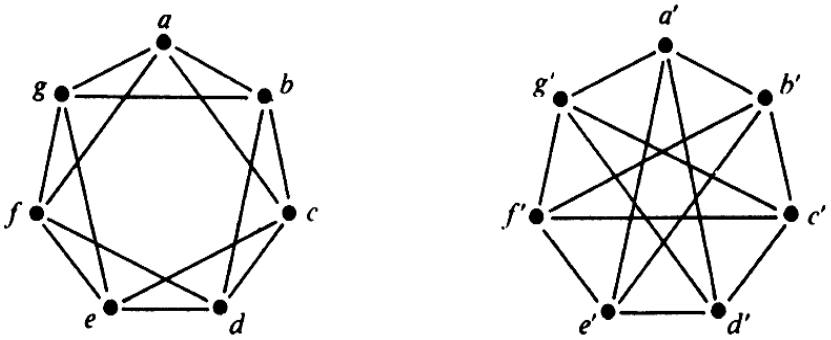
7.	a)	There are 30 females and 35 males in the junior class while there are 25 females and 20 males in the senior class. In how many ways can a committee of 10 be chosen so that there are exactly 5 females 3 juniors on the committee?	7 Marks	L3	CO4	PO3
	b)	Solve the recurrence relation $F_n = F_{n-1} + F_{n-2}$, given $F_0 = F_1 = 1$.	7 Marks	L2	CO4	PO3

(OR)

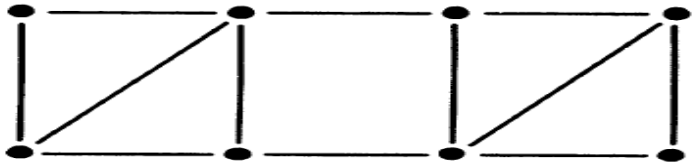
8.	a)	How many different license plates are there (allowing repetitions): i) Involving 3 letters and 4 digits if the 3 letters must appear together either at the beginning or at the end of the plate. ii) Involving 1, 2, or 3 letters and1, 2, 3, or 4 digits if the letters must occur together.	7 Marks	L2	CO4	PO3
	b)	Solve the reccurence relation $a_n - 4\,a_{n-1} + 4\,a_{n-2} = 0$, given $a_1 = 1$, $a_2 = 1$.	7 Marks	L2	CO4	PO3

UNIT-V

9.	a)	What is meant by Isomorphism? Determine whether the following graphs G_1 and G_2 Isomorphic or not.	7 Marks	L3	CO5	PO3



	b)	Define the Hamiltonian Path and Hamiltonian Cycle. Determine whether the given graph is Hamiltonian or not.	7 Marks	L3	CO5	PO3



(OR)

10.	a)	Write the procedure to do Breadth first search.	7 Marks	L3	CO5	PO3
	b)	What is a planar graph and discuss Euler formula. Give an example of non-planar graph.	7 Marks	L2	CO5	PO3

CODE No.: 20BT12902 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Regular Examinations April – 2022

FUNDAMENTALS OF BUSINESS INFORMATION SYSTEMS

[Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	How can computer-based information systems help an organization in managerial decision making?	7 Marks	L3	CO1	PO1
	b)	Discuss about the various qualities of information, knowledge and wisdom.	7 Marks	L4	CO1	PO1
		(OR)				
2.	a)	Explain, what are the different steps involved in acquiring and developing a business information system.	7 Marks	L3	CO1	PO1
	b)	Describe some of the major categories of business information system.	7 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Describe some of the major characteristics of microcomputers.	7 Marks	L2	CO2	PO2
	b)	Illustrate different built-in functions of processors in personal computers.	7 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Discuss the process of selecting input and out devices of a computer system.	7 Marks	L2	CO2	PO1
	b)	Write a short note on applications of internet tools.	7 Marks	L4	CO2	PO1
		UNIT-III				
5.	a)	Explain the limitations of database management systems.	7 Marks	L3	CO3	PO1
	b)	Compare and contrast OLAP and OLTP.	7 Marks	L1	CO3	PO1
		(OR)				
6.	a)	Describe the major components of business intelligence.	7 Marks	L2	CO3	PO1
	b)	Explain the importance of architecture data mining when an organization has existing data warehouse.	7 Marks	L3	CO3	PO1
		UNIT-IV				
7.	a)	Explain in detail Firewalls, its purpose and uses in Internet usage.	7 Marks	L3	CO4	PO2
	b)	What are: i) computer networks ii) network Components iii) network types?	7 Marks	L2	CO4	PO1
		(OR)				
8.	a)	Explain various Internet Marketing Strategies to help business improvement.	7 Marks	L3	CO4	PO1
	b)	What are the applications of computer networks?	7 Marks	L1	CO4	PO1
		UNIT-V				
9.	a)	What is the importance of supply chain? What are the different processes in managing the supply chain?	7 Marks	L1	CO5	PO1
	b)	Explain the role of ERP system in procurement process.	7 Marks	L4	CO6	PO1
		(OR)				
10.	a)	Describe how can workflow software and groupware assist in re-engineering of an organisation.	7 Marks	L3	CO5	PO1
	b)	Discuss the implementation and maintenance of Enterprise systems.	7 Marks	L2	CO5	PO1

CODE No.: 20BT1BS01 SVEC-20

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Regular Examinations April – 2021

DIFFERENTIAL EQUATIONS AND MULTIVARIABLE CALCULUS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Structures), Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Solve the differential equation $\frac{d^2y}{dx^2} + \frac{dy}{dx} + y = x^3$.	7 Marks	L3	CO1	PO1
	b)	Solve the differential equation $\frac{d^3y}{dx} + y = \cos(2x-1)$.	7 Marks	L3	CO1	PO1
		(OR)				
2.	a)	Using the method of variation of parameters, solve $y''-y=\frac{2}{(1+e^x)}$.	7 Marks	L3	CO1	PO1
	b)	Find the general solution of the differential equation $(D^2+1)y = x\cos x..$	7 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Construct the partial differential equation by eliminating the arbitrary function ϕ *from* $\phi\ (x^2+y^2+z^2, x+y+z) = 0$.	7 Marks	L3	CO1	PO2
	b)	Find the general solution of the linear partial differential equation $(x^2-yz)\,p+(y^2-zx)\,q=z^2-xy.$	7 Marks	L1	CO1	PO2
		(OR)				
4.	a)	Solve the partial differential equation $(D^2+DD'-6D'^2)z = y\cos x$.	7 Marks	L3	CO1	PO1
	b)	Solve the partial differential equation $(2DD'+D'^2-3D')z = 3\cos(3x-2y).$	7 Marks	L3	CO1	PO2
		UNIT-III				
5.	a)	Determine $\frac{\partial(x,y,z)}{\partial(u,v,w)}$, when $x+y+z=u,\ y+z=uv,\ z=uvw.$	7 Marks	L3	CO2	PO1
	b)	Show that the functions $u=x+y+z,\ v=x^2+y^2+z^2,\ w=x^3+y^3+z^3-3xyz$ are functionally dependent and hence obtain the relation between them.	7 Marks	L3	CO2	PO2
		(OR)				

6.	a)	Examine the maxima and minima of the function $f(x,y) = x^3y^2(1-x-y)$.	7 Marks	L3	CO2	PO2
	b)	Using Lagrange's method of undetermined multipliers, calculate the maximum value of $x^2y^2z^2$ *when* $x+y+z=1$.	7 Marks	L3	CO2	PO1
		UNIT-IV				
7.	a)	Evaluate $\int\int_R xydxdy$, *where R* is the region bounded by the positive quadrant of the circle $x^2+y^2=a^2$.	7 Marks	L5	CO2	PO1
	b)	Applying the change of order of integration, evaluate $\int_0^1\int_x^{\sqrt{x}} xy\,dydx$.	7 Marks	L3	CO2	PO2
		(OR)				
8.	a)	Evaluate $\int_0^1\int_x^{\sqrt{1-x^2}}\int_0^{\sqrt{1-x^2}-y^2} xyz\,dzdydx$.	7 Marks	L5	CO2	PO1
	b)	By changing to polar coordinates, evaluate the double integral $\int_0^a\int_x^{\sqrt{a-y^2}}\left(x^2+y^2\right)dydx$.	7 Marks	L3	CO2	PO2
		UNIT-V				
9.	a)	Determine the directional derivative of the field $\phi = x^2yz + 4xz^2$ at the point (1,-2,1) in the direction of the normal to the surface $x\log z - y^2 = -4$ at the point (-1,2,1).	7 Marks	L3	CO2	PO1
	b)	Evaluate the line integral over a circular path $x^2+y^2=a^2, z=0$ for a vector field $\overline{F} = \sin y\,\overline{i} + x(1+\cos y)\,\overline{j}$.	7 Marks	L5	CO2	PO1
		(OR)				
10.		Verify Gauss divergence theorem for the field $\overline{F} = (x^2-yz)\,\overline{i} + (y^2-zx)\,\overline{j} + (z^2-xy)\,\overline{k}$ taken over a rectangular parallelepiped $0\le x\le a,\ 0\le y\le b,\ 0\le z\le c$.	14 Marks	L5	CO2	PO2

CODE No.: 20BT1BS02 SVEC-20

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Regular Examinations April – 2021

ENGINEERING CHEMISTRY

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Describe the ion exchange process with a neat diagram. Ion exchange process is more advantageous than zeolite process. Why?	10 Marks	L2	CO1	PO1
	b)	List any four specifications of potable water as per WHO and BIS standards.	4 Marks	L1	CO1	PO6
		(OR)				
2.	a)	Congratulations for running a project on 'drinking water supply by using brackish water' to your college successfully. Outline your action of plan behind the project success.	8 Marks	L2	CO1	PO1
	b)	A liter of standard hard water was prepared by dissolving 1 gram of $CaCO_3$ in distilled water. 50 mL of this water required 46 mL of EDTA solution while 50 mL of the given hard water sample consumed 20 mL of EDTA solution, while the same amount of hard water sample after boiling required 12 mL of EDTA solution. Calculate the carbonate and non-carbonate hardness of water.	6 Marks	L3	CO1	PO2
		UNIT-II				
3.		How can you apply Valence Shell Electron Pair Repulsion theory to predict the shapes of various molecules?	14 Marks	L3	CO2	PO2
		(OR)				
4.		Derive the Schrodinger wave equation and write its significance.	14 Marks	L3	CO2	PO1
		UNIT-III				
5.	a)	Explain the chemistry involved in concentration cell corrosion.	6 Marks	L2	CO3	PO1
	b)	Define electroplating. Explain electroplating of nickel over metal object.	8 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Describe the construction and working of lithium ion battery.	12 Marks	L2	CO3	PO1
	b)	Write the Nernst's equation for the electrode reaction: $M^{n+}(aq) + ne^- \rightarrow M(s)$	2 Marks	L1	CO3	PO1
		UNIT-IV				
7.		Discuss the principle and working of a UV-Visible spectrometer with the help of a block diagram.	14 Marks	L2	CO4	PO1
		(OR)				
8.	a)	Write the principle and applications of Transmission Electron Microscope.	8 Marks	L1	CO4	PO1
	b)	Write the applications of IR spectroscopy.	6 Marks	L1	CO4	PO1

		UNIT-V				
9.	a)	Explain the mechanism of lubrication appears in sewing machines and moving surfaces under very high pressure and speed.	10 Marks	L2	CO5	PO1
	b)	Define lubrication. Recall four major functions of lubricants.	4 Marks	L1	CO5	PO1
		(OR)				
10.		Describe the Fischer-Tropsch method with a neat diagram and write the advantages, disadvantages of synthetic petrol.	14 Marks	L2	CO5	PO1

CODE No.: 20BT1BS03 SVEC-20

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Regular Examinations April – 2021

ENGINEERING PHYSICS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Structures)]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	How Newton's rings are formed? Derive an expression for the wavelength of a monochromatic source using Newton's ring experiment.	10 Marks	L3	CO1	PO2
	b)	In a Newton's rings experiment the diameter of the 10^{th} ring was found to be 0.45cm and the 5^{th} ring was 0.24cm. The wavelength of light source is 5830 Å. Calculate the radius of curvature of given plano-convex lens.	4 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Discuss the Fraunhoffer diffraction at a single slit. Explain the condition for principal maximum and minimum.	10 Marks	L2	CO1	PO1
	b)	List the differences between polarized light and un-polarized light.	4 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Explain the Maxwell's equation in differential form and integral form and its significance.	9 Marks	L2	CO2	PO2
	b)	Outline the divergence and curl of a magnetic field.	5 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Explain the classification of an optical fibre on the basis of refractive index profile and modes of propagation with neat sketches.	10 Marks	L2	CO2	PO1
	b)	In an optical fibre, the material has refractive indices of core and cladding of 1.55 and 1.50 respectively. Calculate the acceptance angle and numerical aperture.	4 Marks	L3	CO2	PO2
		UNIT-III				
5.	a)	Summarize intrinsic semiconductors.	4 Marks	L2	CO3	PO1
	b)	Derive an expression for density of electrons in conduction band of intrinsic semiconductor.	10 Marks	L3	CO3	PO2
		(OR)				
6.	a)	Distinguish between direct and indirect band gap semiconductors.	5 Marks	L4	CO3	PO1
	b)	Describe the construction and working of LED with a neat diagram.	9 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	Develop an expression for internal field experienced by an atom in a dielectric material.	11 Marks	L3	CO4	PO2
	b)	What is orientation Polarization?	3 Marks	L1	CO4	PO1
		(OR)				

8.	a)	Explain the origin of magnetic moment in an atom.	8 Marks	L2	CO4	PO1
	b)	Differentiate hard and soft magnetic materials.	6 Marks	L2	CO4	PO1
		UNIT-V				
9.	a)	Distinguish between Type-I and Type-II superconductors.	6 Marks	L4	CO5	PO1
	b)	Discuss the BCS theory of superconductivity.	8 Marks	L2	CO5	PO1
		(OR)				
10.	a)	What are nanomaterials? Why the properties of nanomaterials different from the properties of a bulk material?	7 Marks	L1	CO5	PO1
	b)	Explain the various properties of nanomaterials.	7 Marks	L2	CO5	PO1

CODE No.: 20BT1BS04 SVEC-20

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Regular Examinations July – 2021

APPLIED PHYSICS

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Outline the structure of an optical fiber. Derive an expression for acceptance angle of a fiber.	9 Marks	L2	CO1	PO1
	b)	Predict acceptance angle, numerical aperture and fractional change in refractive index of given optical fiber, if the refractive indices of the core and the cladding are 1.56 and 1.48 respectively.	5 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Classify the optical fibres based on refractive index profile and modes of propagation with a neat sketch.	9 Marks	L2	CO1	PO1
	b)	Summarize the double crucible technique to fabricate optical fiber.	5 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Define absorption coefficient. Derive an expression for absorption coefficient of a material.	7 Marks	L3	CO1	PO1
	b)	State the acoustic requirements of a good auditorium. Explain how these requirements can be achieved.	7 Marks	L2	CO1	PO1
		(OR)				
4.	a)	Define ultrasonics. Describe the working mechanism of Magnetostriction method for the production of ultrasonics.	8 Marks	L2	CO1	PO1
	b)	Explain any two industrial application of ultrasonics.	6 Marks	L2	CO1	PO1

UNIT-III

5.	a)	Derive an expression for maximum height and horizontal range of a projectile in inclined projection.	7 Marks	L2	CO2	PO2
	b)	Show that the path of a projectile is a parabola in a curvilinear motion.	7 Marks	L1	CO2	PO2
		(OR)				
6.	a)	Distinguish between rectilinear motion and curvilinear motion.	7 Marks	L4	CO2	PO1
	b)	Develop an expression for work energy equation for a body of weight W undergoing a translation motion.	7 Marks	L3	CO2	PO2

UNIT-IV

7.	a)	Define thermal conductivity and derive an expression for coefficient of thermal conductivity.	10 Marks	L3	CO2	PO2
	b)	The total area of glass window is 0.5m². Calculate how much heat is conducted per hour through the plane of thickness of glass 0.6cm. Inside and outside temperature are 23°C and 2°C respectively. Given that K for glass is 1 W/m°C	4 Marks	L3	CO2	PO2
		(OR)				
8.	a)	What is bad conductor of heat transfer? Discuss the Lees' disc method to find thermal conductivity of a bad conductor.	8 Marks	L2	CO2	PO1
	b)	Explain different modes of heat transfer and give their significance.	6 Marks	L2	CO2	PO1

UNIT-V

9.	a)	Discuss the mechanical, chemical and electrical properties of metallic glasses.	7 Marks	L2	CO3	PO1
	b)	Outline the application of metallic glasses.	7 Marks	L2	CO3	PO1
		(OR)				
10.	a)	What are the characteristics of shape memory alloys? Write their properties.	7 Marks	L1	CO3	PO1
	b)	What are the shape memory alloys and outline the properties of NiTi alloy?	7 Marks	L2	CO3	PO1

CODE No.: 20BT1HS01 SVEC-20

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Regular Examinations July – 2021

COMMUNICATIVE ENGLISH

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Structures), Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	What is communication and explain the importance of communicating in English.	7 Marks	L2	CO1	PO1
	b)	"The four major skills (LSRW) are essential for effective communication". Discuss.	7 Marks	L2	CO2	PO2
		(OR)				
2.		"Words conceal but actions reveal". Analyze this statement in relation with Non-verbal communication.	14 Marks	L4	CO4	PO10
		UNIT-II				
3.	a)	"Listening involves a more sophisticated mental process than hearing". Explain.	7 Marks	L2	CO2	PO2
	b)	Discuss the possible reasons if a person has poor listening skills.	7 Marks	L2	CO2	PO2
		(OR)				
4.		Discuss barriers to listening and provide appropriate remedies to overcome.	14 Marks	L2	CO2	PO2
		UNIT-III				
5.	a)	"One should know how to overcome the stage fright and be confident to grow in academic and professional career". Illustrate.	7 Marks	L2	CO4	PO10
	b)	What is the significance of conference in developing analytical and questioning skills?	7 Marks	L1	CO4	PO10
		(OR)				
6.		Explain how paralinguistic features enhance the impact of our speech and make it live and dynamic.	14 Marks	L2	CO1	PO1
		UNIT-IV				
7.	a)	Explain intensive and extensive reading in detail.	7 Marks	L2	CO2	PO2
	b)	Discuss the importance of topic sentence and its role in analyzing the paragraph.	7 Marks	L2	CO2	PO2
		(OR)				
8.		Discuss SQ3R reading techniques.	14 Marks	L2	CO3	PO5
		UNIT-V				
9.	a)	Explain the characteristics of technical writing.	7 Marks	L2	CO2	PO2
	b)	"Technical writing must be non-discriminatory in all aspects". Discuss.	7 Marks	L2	CO2	PO2
		(OR)				
10.		Elucidate various elements of style in effective technical writing.	14 Marks	L2	CO3	PO5

❀ ❀ ❀

CODE No.: 20BT10101 SVEC-20

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Regular Examinations July – 2021

ENGINEERING MECHANICS

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Determine the resultant of three forces acting at a point as shown in the Fig.1.	7 Marks	L4	CO1	PO1 PO2 PO6 PO10

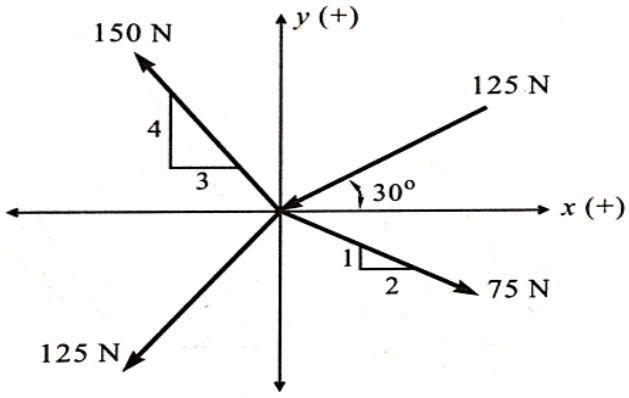


Fig.1

	b)	A circular roller of weight 1000 N and radius 20cm hangs by a tie AB = 40cm and rests against a smooth vertical wall at C as shown in the Fig.2. Determine the tension in the rod and reaction at point C.	7 Marks	L4	CO1	PO1 PO2 PO4 PO6 PO10

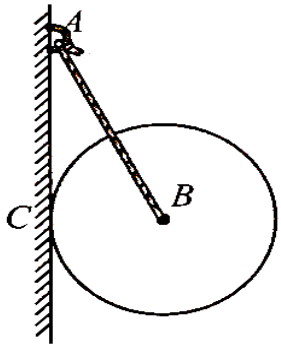


Fig.2

(OR)

2.	a)	Describe different types of beam with neat sketch.	4 Marks	L1	CO1	PO1 PO10
	b)	What kind of frame is the given truss? Determine the forces in all the members of a truss shown in Fig.3. using method of joints.	10 Marks	L4	CO1	PO1 PO2 PO4 PO5 PO6 PO10

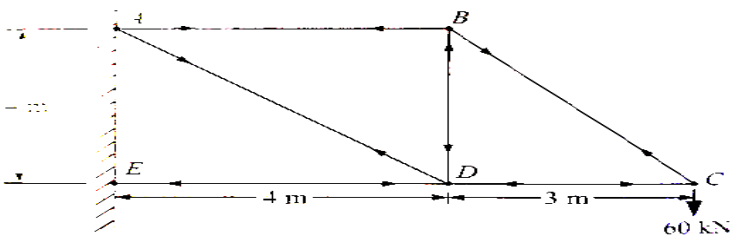


Fig.3

UNIT-II

3.	a)	Explain the laws of friction in detail.	7 Marks	L1	CO2	PO1 PO10
	b)	Determine the frictional force developed on the block shown in the Fig.4 when P = 40 N. The coefficient of friction between block and floor is 0.3.	7 Marks	L4	CO2	PO1 PO2 PO4 PO6 PO10

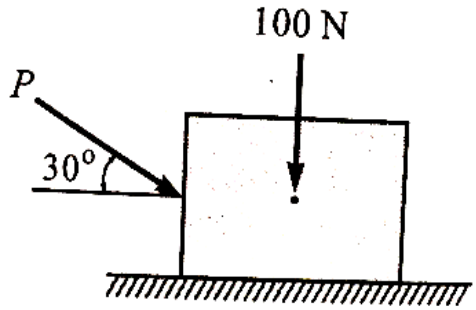


Fig.4

(OR)

4.		A block weighing 1000N rests over block B which weighs 2000N as shown in the Fig.5. Block A is tied to wall with a horizontal string. If the coefficient of friction between blocks A and B is 0.25 and between B and floor is 0.3, what should be the value of P to move the block B if: i) P is horizontal. ii) P acts at 30° upwards to horizontal.	14 Marks	L4	CO2	PO1 PO2 PO4 PO6 PO10

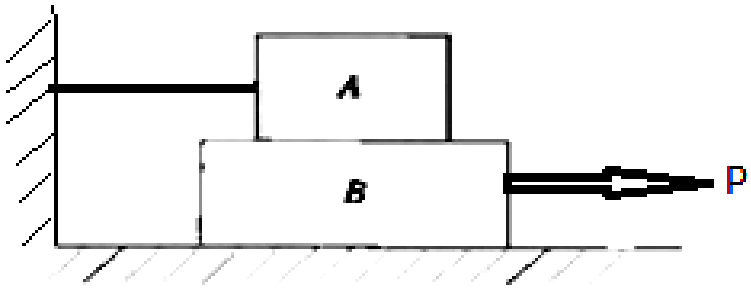


Fig.5

UNIT-III

5.	a)	State and prove the theorem of parallel axis.	4 Marks	L4	CO3	PO1 PO2 PO10
	b)	Find the centroid of the L section shown in below Fig.6.	10 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO10

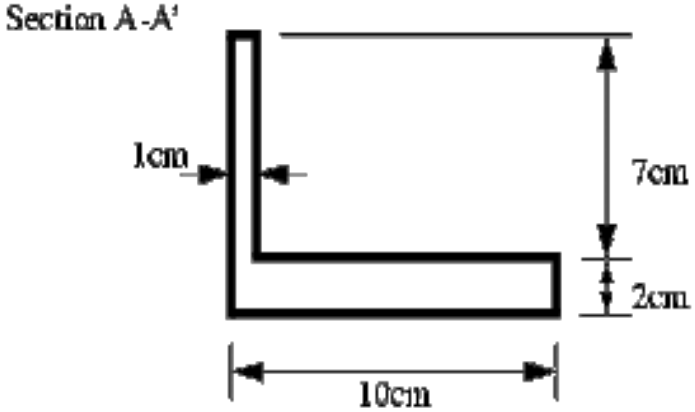
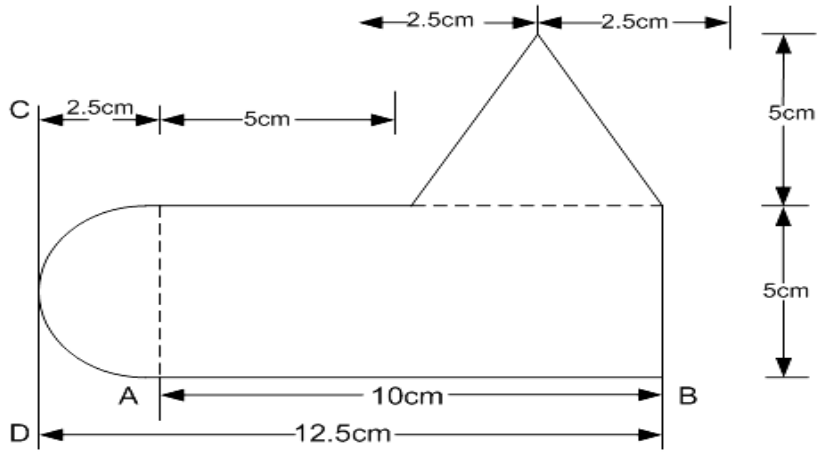


Fig.6

(OR)

6.		Determine the centre of gravity of the plane uniform lamina shown in Fig.7.  Fig.7	14 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO10
		UNIT-IV				
7.	a)	Describe the stress strain relationship for mild steel bar.	7 Marks	L1	CO4	PO1 PO10
	b)	A steel bar 60mm wide, 15mm thick and 350mm long is subjected to an axial pull of 90KN. Determine the changes in the length, width, thickness and the volume of the bar due to the pull applied. Take E = 2 x 10^5 N/mm^2 and μ = 0.32.	7 Marks	L4	CO4	PO1 PO2 PO4 PO5 PO6 PO10
		(OR)				
8.		In a tensile test, a test piece 25mm in diameter, 250mm gauge length, stretched 0.105mm under a pull of 70kN. In a torsion test, the same rod twisted 0.015 radian over a length of 250mm, when a torque of 450Nm was applied. Find the three elastic moduli and the Poison's ratio for the material of the test piece to identify the strength properties of the material.	14 Marks	L4	CO4	PO1 PO2 PO4 PO5 PO6 PO10
		UNIT-V				
9.		A boiler shell is to be made of 15mm thick plate having tensile stress of 120MN/m^2. If the efficiencies of the longitudinal and the circumferential joints are 70% and 30 % respectively, determine : i) Maximum permissible diameter of the shell for an internal pressure of 2 MN/m^2. ii) Permissible intensity of internal pressure if the shell diameter is 1.5m.	14 Marks	L6	CO5	PO1 PO2 PO3 PO4 PO5 PO6 PO10
		(OR)				
10.		A thick wall closed-end cylinder is made up of an aluminum alloy (E = 72 GPa, μ = 0.33), has inside diameter of 200mm and outside diameter of 800mm. The cylinder is subjected to internal fluid pressure of 150MPa. Determine the principal stresses and maximum shear stresses at a point on the inside surface of the cylinder. Also determine the increase in inside diameter due to fluid pressure.	14 Marks	L4	CO5	PO1 PO2 PO4 PO5 PO6 PO10

❀ ❀ ❀

CODE No.: 20BT10201 SVEC-20

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Regular Examinations July – 2021

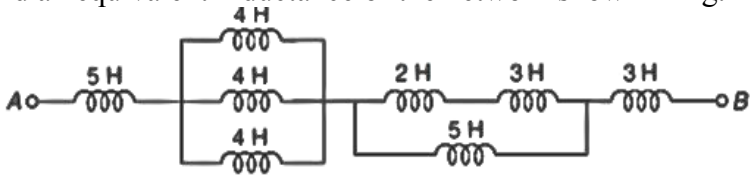
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

[Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Structures)]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	The voltage and current through circuit elements are $v = 100 \sin (314 t + 45°)$ volts $i = 10 \sin (314 t + 315°)$ amperes i) Identify the circuit elements. ii) Find the value of the elements. iii) Obtain an expression for power.	8 Marks	L2	CO1	PO2
	b)	Define the following terms i) Real power. ii) Reactive Power. iii) Apparent Power. iv) Power Factor.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Find an equivalent inductance of the network shown in fig. 	7 Marks	L2	CO1	PO1
	b)	State Kirchhoff's laws and validate the laws with a suitable example.	7 Marks	L2	CO1	PO1

UNIT-II

3.	a)	With neat sketch, explain the operation of hydro power plant. How does hydropower plant superior compared to a thermal power plant in terms of environmental prospect?	7 Marks	L2	CO2	PO7
	b)	Explain the operation of MCB with the help of relevant diagram.	4 Marks	L2	CO2	PO1
	c)	Explain the significance of Energy Efficiency ratio.	3 Marks	L2	CO2	PO8
		(OR)				
4.	a)	Mention the differences between MCB and MCCB.	7 Marks	L2	CO2	PO2
	b)	Mention the disadvantages of low power factor. Suggest suitable methods to improve the power factor.	4 Marks	L2	CO2	PO2
	c)	Explain the objective of BEE standard.	3 Marks	L2	CO2	PO8

UNIT-III

5.		Explain the principle of operation and constructional features of a three phase induction motor. Mention its applications.	14 Marks	L2	CO3	PO1
		(OR)				
6.	a)	With neat sketch, demonstrate the working principle of single phase transformer.	7 Marks	L2	CO3	PO1
	b)	Explain the constructional details and working of single phase resistor start induction motor.	7 Marks	L2	CO3	PO1

UNIT-IV

7.		Explain the operation of full-wave-rectifier without filter and derive the expressions for ripple factor, % regulation, efficiency and PIV.	14 Marks	L2	CO4	PO2

(OR)

8.	a)	Discuss the working of NPN and PNP transistor with a neat sketch.	7 Marks	L2	CO4	PO1
	b)	Explain the input and output characteristic of a transistor in Common Emitter configurations.	7 Marks	L2	CO4	PO1

UNIT-V

9.	a)	Draw the block diagram of operational amplifier and explain it in detail.	7 Marks	L2	CO4	PO1
	b)	What are the differences between the inverting and non-inverting terminals? What do you mean by the term "virtual ground"?	7 Marks	L2	CO4	PO2

(OR)

10.	a)	Explain the working of a summing amplifier using Op-Amp and derive its output voltage expression.	7 Marks	L2	CO4	PO1
	b)	Construct a circuit to realize $V_{out} = 5V_1 + 2V_2 - 3V_3$ using Op-Amp.	7 Marks	L3	CO4	PO2

CODE No.: 20BT10301 SVEC-20

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Regular Examinations July – 2021

MATERIAL SCIENCE AND ENGINEERING

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Classify point defects and explain it with neat sketches.	8 Marks	L2	CO1	PO1
	b)	Draw Iron-Iron-Carbide diagram neatly and explain the critical temperatures, phases and boundaries existing in it.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Define solid solution. Differentiate between Substitutional and Interstitial solid solutions with neat sketches. Also write Hume-Rothery's rule for formation of solid solutions.	7 Marks	L2	CO1	PO1 PO2
	b)	Write all invariant reactions in phase diagram and explain the eutectoid zone briefly with neat sketch.	7 Marks	L2	CO1	PO1 PO2 PO3
		UNIT-II				
3.	a)	"The normalized steel is found to be superior to that of annealed steel". Explain the reason behind this statement.	7 Marks	L3	CO1	PO1 PO2
	b)	List the objectives of heat treatment of metals.	7 Marks	L1	CO1	PO1
		(OR)				
4.	a)	Differentiate between Austempering and Martempering.	7 Marks	L1	CO1	PO2
	b)	Write the importance/objectives of continuous cooling transformation diagrams.	7 Marks	L2	CO1	PO1
		UNIT-III				
5.	a)	Describe the stainless steels with respect to composition, properties and applications.	7 Marks	L1	CO2	PO1 PO2
	b)	Give the classifications and applications of low alloy steels. Also give the specifications of steels.	7 Marks	L2	CO2	PO1
		(OR)				
6.		Give the composition, microstructure and applications of: i) Grey cast iron. ii) Malleable iron. iii) White cast iron.	14 Marks	L1	CO2	PO1 PO2 PO3
		UNIT-IV				
7.	a)	What alloys of copper are mainly used in engineering constructions? State their approximate compositions, properties and fields of use.	8 Marks	L3	CO2	PO1
	b)	List the properties and applications of Nickel based alloys.	6 Marks	L1	CO2	PO1
		(OR)				
8.	a)	Explain the composition, properties and uses of Tool steels.	7 Marks	L2	CO2	PO2
	b)	Write short notes on alloying metals for aluminium alloy.	7 Marks	L1	CO2	PO1
		UNIT-V				
9.	a)	What are the ceramic materials? State their outstanding properties.	7 Marks	L2	CO2	PO3
	b)	Differentiate between particle reinforced and fiber reinforced composites.	7 Marks	L2	CO2	PO3
		(OR)				
10.	a)	Mention advantages, limitations and applications of Metal matrix composites and Ceramic matrix composites.	8 Marks	L1	CO2	PO1 PO2
	b)	Explain classification, properties and applications of polymer	6 Marks	L1	CO2	PO1

matrix composites, state its effect on environment. PO7

CODE No.: 20BT10341 SVEC-20

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Regular Examinations July – 2021

BASIC CIVIL AND MECHANICAL ENGINEERING

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

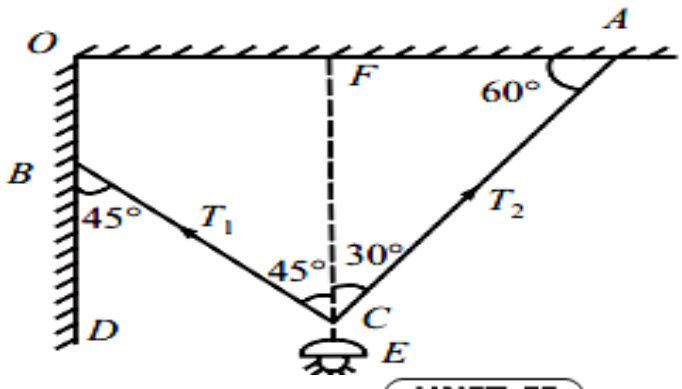
1.	a)	Briefly explain how Civil Engineering contributes for the welfare of society.	7 Marks	L1	CO1	PO1 PO6
	b)	The following observations were taken to a boundary from a chain line.	7 Marks	L4	CO1	PO1 PO2 PO5

Distance in m	0	10	20	30	40	50	60	70
Offset in m	2.4	3.6	4.2	4.8	4.4	3.8	2.8	1.2

Calculate the area enclosed between the chain line, the boundary line and the end offsets by:
i) Trapezoidal rule.
ii) Simpson's rule.

(OR)

2.	a)	Discuss the geological and physical classification of rocks.	6 Marks	L4	CO1	PO1 PO2
	b)	An electric light fixture weighing 15N hangs from a point C, by two strings AC and BC. The string AC is inclined at 60º to the horizontal and BC at 45º to the horizontal as shown in figure below. Determine the forces in the strings AC and BC using Lami's theorem.	8 Marks	L4	CO1	PO1 PO2 PO10



UNIT-II

3.	a)	What are the requirements of good foundation?	6 Marks	L2	CO1	PO1 PO8
	b)	Explain different types of bonds used in brick masonry with sketches.	8 Marks	L2	CO1	PO1 PO5 PO10

(OR)

4.	a)	Mention different types of roofs and explain briefly.	7 Marks	L2	CO1	PO1
	b)	What is rainwater harvesting? Explain about types of rainwater harvesting systems.	7 Marks	L4	CO1	PO1 PO5 PO7

UNIT-III

5.		Explain the working principle of 4 stroke petrol engine with neat sketch.	14 Marks	L2	CO2	PO1
		(OR)				
6.		Describe the working principle of centrifugal pump with neat sketch.	14 Marks	L2	CO2	PO1

UNIT-IV

7.	a)	Explain the different types of belt drives with neat sketches.	7 Marks	L2	CO2	PO1
	b)	Derive the expression for power transmitted by the belt drive.	7 Marks	L2	CO2	PO1 PO2
		(OR)				
8.	a)	List out various types of gears and write its applications.	7 Marks	L1	CO2	PO1
	b)	Derive the expression for power transmitted by the simple gear train.	7 Marks	L2	CO2	PO1 PO2

UNIT-V

9.		What are the advantages of casting process and mention its applications?	14 Marks	L2	CO2	PO1
		(OR)				
10.		Name the different types of machining processes on lathe machine with suitable examples.	14 Marks	L2	CO2	PO1

CODE No.: 20BT11201 SVEC-20

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Regular Examinations July – 2021

PROGRAMMING FOR PROBLEM SOLVING

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Structures), Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the structure of a C program with a neat diagram.	7 Marks	L2	CO1	PO1
	b)	Define Token. Discuss the tokens of the C language.	7 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Demonstrate the use of formatted input and output functions with a program.	7 Marks	L2	CO1	PO1
	b)	Write a C program that demonstrates a Type conversion process.	7 Marks	L3	CO1	PO3
		UNIT-II				
3.	a)	Explain the conditional statements of C language.	7 Marks	L2	CO1	PO1
	b)	Write a C program to find the largest among three given numbers.	7 Marks	L3	CO1	PO3
		(OR)				
4.	a)	Define Flowchart. Draw the flowchart that shows the addition of two numbers.	7 Marks	L2	CO2	PO3
	b)	Explain the problem solving aspects.	7 Marks	L2	CO2	PO1
		UNIT-III				
5.	a)	Define an Array. Explain the declaration, initialization and accessing of Array elements with a suitable program.	7 Marks	L2	CO3	PO1
	b)	Write a C program to implement the addition of two matrices.	7 Marks	L3	CO3	PO3
		(OR)				
6.	a)	Write the syntax of a function and list its advantages. Explain call-by-value with a suitable example.	7 Marks	L2	CO3	PO1
	b)	Write a C program that demonstrates the scope of *auto* and *extern* variables.	7 Marks	L3	CO3	PO3
		UNIT-IV				
7.	a)	Compare ***void*** pointer and ***NULL*** pointer with a suitable program.	7 Marks	L2	CO3	PO2
	b)	Define call-by-address. Write a C program to swap the values of two variables using the call-by-address.	7 Marks	L3	CO3	PO3
		(OR)				
8.	a)	Explain the following with a suitable example: i) Pointer arithmetic. ii) Array of pointers.	7 Marks	L2	CO4	PO1
	b)	Write a C program to allocate the memory dynamically to an Array of length *N*. Write the necessary code to store and display *N* integer elements.	7 Marks	L3	CO4	PO3
		UNIT-V				

9.	a)	Explain the structure declaration, initialization and accessing the members of structure with a neat syntax.	7 Marks	L2	CO5	PO1
	b)	Write a C program to store and retrieve the details include name, roll-no, branch, section and phone-no of *N* students.	7 Marks	L3	CO5	PO3
		(OR)				
10.	a)	Compare and contrast Structure and Union.	7 Marks	L2	CO5	PO2
	b)	Write a C program that uses pointers to initialize the members of the structure.	7 Marks	L3	CO5	PO3

CODE No.: 20BT12901 SVEC-20

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Regular Examinations April – 2021

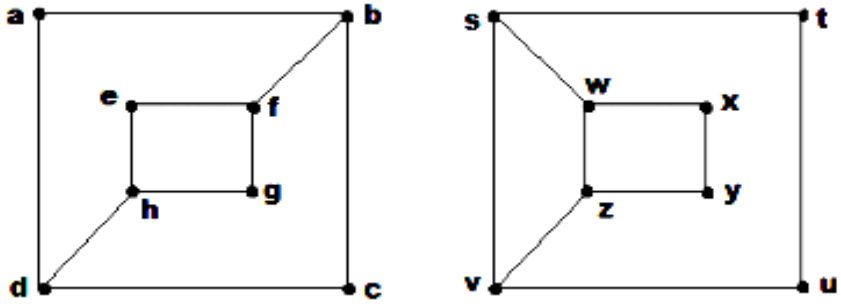
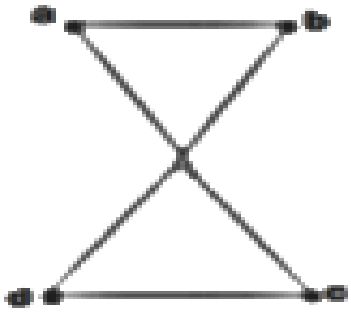
DISCRETE MATHEMATICAL STRUCTURES

[Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Using Truth Table show that $\left((P \vee Q) \wedge \sim (\sim P \wedge (\sim Q \vee \sim R))\right) \vee \left(\sim P \wedge Q\right) \vee \left(\sim P \wedge \sim R\right)$ is a tautology.	7 Marks	L4	CO1	PO2
	b)	Obtain principal conjunctive normal form for the formula Q∧(P∨~Q) without using Truth Table.	7 Marks	L3	CO1	PO4
		(OR)				
2.	a)	Are these premises $p \to r, q \to r, (p \vee q) \to r$ consistent? Justify the answer.	7 Marks	L2	CO1	PO1
	b)	Write the following statement in the symbolic form. "Mark is poor but happy" "Mark is rich or unhappy" "Mark is neither rich nor unhappy" "Mark is poor or he is both rich and unhappy"	7 Marks	L3	CO1	PO2
		UNIT-II				
3.	a)	Let X = {1, 2, 3} Y = {p, q} and Z = {a, b} Also: $f: X \to Y$ be f = {(1, p), (2, q), (3, q)} $g: Y \to Z$ be g = {(p, b), (q, p)} Find *fog*, *fof* , *gog* .	7 Marks	L2	CO2	PO1
	b)	Let S= {1,2,3,4,5,6,7,8,9,10} and the relation R on the set S is R = { (x , y) / x + y=10}. What are the properties of on R?	7 Marks	L2	CO2	PO2
		(OR)				
4.	a)	Give an example for symmetric, ant symmetric, compatibility and transitive relations.	7 Marks	L3	CO2	PO2
	b)	Illustrate that (S, /) is a lattice under poset, where S = (1,2,3,6) and / is for divisibility.	7 Marks	L2	CO2	PO1
		UNIT-III				
5.	a)	Let z be the set of integers and addition, multiplication are binary operations on set (+,*) i) Find whether (z, +) is monoid or not. ii) Find whether (z, +) is group or not.	7 Marks	L3	CO3	PO3
	b)	In a monoid, show that the set of all left invertible element form a sub monoid.	7 Marks	L3	CO3	PO4
		(OR)				
6.	a)	Let **f** be a homomorphism from a group G_1 to the group G_2 then show that if e_1 is the identity in G_1 and e_2 is the identity in G_2 then $f(e_1) = e_2$	7 Marks	L3	CO3	PO4
	b)	(G,*) is a group and (a, b)€G then show that $(a * b)^{-1} = b^{-1} * a^{-1}$.	7 Marks	L3	CO3	PO4

		UNIT-IV				
7.	a)	Compute the number of six letter combinations of the letter of English alphabet. If no letter is to appear in the combination more than 2 times.	7 Marks	L3	CO4	PO3
	b)	Find the coefficient of x^{23} and x^{32} for the function $(1 + x^5 + x^9)^{10}$.	7 Marks	L3	CO4	PO3
		(OR)				
8.	a)	How many ways are there for 10 red balls, 8 green balls and 6 blue balls to be in a line, so that at least 2 balls of same color must be placed side by side?	7 Marks	L3	CO4	PO3
	b)	Show that x-y is a factor of the polynomial $x^n - y^n$ where $n \geq 0$ using Mathematical induction	7 Marks	L3	CO4	PO4
		UNIT-V				
9.	a)	Define the following with an example. i) Connected Graph. ii) Connected component. iii) Complete Graph. iv) Sub Graph with an example for each.	7 Marks	L2	CO5	PO1
	b)	Show that the following graphs G and H are not isomorphic. 	7 Marks	L3	CO5	PO4
		(OR)				
10.	a)	How many paths of length four are there from *a* to *d* in the simple graph of G given below. 	7 Marks	L3	CO5	PO3
	b)	Draw the complete graph of *K*5 with vertices A, B, C, D, E. And also find sub graph of *K*5 with 4 vertices.	7 Marks	L3	CO5	PO1

❀ ❀ ❀

CODE No.: 20BT12902 SVEC-20

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Regular Examinations July – 2021

FUNDAMENTALS OF BUSINESS INFORMATION SYSTEMS

[Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	"The survival of a large organization depends upon access to high-quality information". Justify this statement with relevant examples.	7 Marks	L2	CO1	PO2
	b)	Explain the levels of managerial decision making process.	7 Marks	L2	CO1	PO1
		(OR)				
2.	a)	How can computer-based information systems help an organization to achieve a strategic advantage over its competitors?	7 Marks	L3	CO1	PO1
	b)	Explain the reasons for the adoption of enterprise resource planning systems in organizations.	7 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Explain the component of computer system with neat diagram.	7 Marks	L3	CO2	PO1
	b)	Discuss about the reasons for the continued use of mainframe computers?	7 Marks	L4	CO2	PO2
		(OR)				
4.	a)	Illustrate different built-in functions of Spreadsheet program.	7 Marks	L2	CO2	PO2
	b)	Write a short note on applications of internet tools.	7 Marks	L4	CO2	PO1
		UNIT-III				
5.	a)	What is data mining and how can it bring benefits to a business organization?	7 Marks	L2	CO3	PO1
	b)	Compare and contrast OLAP and OLTP.	7 Marks	L2	CO3	PO2
		(OR)				
6.	a)	Explain the role of data marts when an organization has an existing data warehouse.	7 Marks	L3	CO3	PO1
	b)	What are the advantages of a real-time data warehouse?	7 Marks	L1	CO3	PO1
		UNIT-IV				
7.	a)	Describe the two main functions of an Internet Service Provider (ISP). How does ISP differ from applications service providers?	7 Marks	L3	CO4	PO2
	b)	Name the three ways in installing a local-area network which reduce costs. Explain how it is achieved.	7 Marks	L2	CO4	PO1
		(OR)				
8.	a)	Explain the term 'electronic data interchange'. What is its relevance to companies now that the Internet is widely used for data exchange?	7 Marks	L2	CO4	PO1
	b)	Explain the purpose of a network operating system.	7 Marks	L1	CO4	PO1
		UNIT-V				
9.	a)	Compare and contrast different levels of integration in Supply Chain Management (SCM) with suitable example.	7 Marks	L4	CO6	PO2
	b)	How transaction processing systems are managed, given their mission-critical role in many organizations?	7 Marks	L4	CO5	PO2
		(OR)				
10.	a)	How workflow software and groupware assist in re-engineering of an organization?	7 Marks	L3	CO5	PO2
	b)	Discuss special precautions needed to be taken when using IT for managing human resources.	7 Marks	L2	CO6	PO1

CODE No.: 20BT1BS01 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Supplementary Examinations March – 2022

DIFFERENTIAL EQUATIONS AND MULTIVARIABLE CALCULUS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering, Computer Science and Business Systems, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Science)]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Find the general solution of differential equation $\frac{d^2y}{dx^2}+2\frac{dy}{dx}+2y=e^{-2x}+\cos 2x.$	7Marks	L1	CO1	PO1
	b)	Solve the differential equation $\frac{d^2y}{dx^2}-5\frac{dy}{dx}+6y=e^x\sin x.$	7 Marks	L3	CO1	PO1
		(OR)				
2.	a)	Solve the differential equation $\frac{d^2x}{dt^2}+x=t\cos 2t$ given $x=0,\frac{dx}{dt}=0$ at $t=0$.	7 Marks	L3	CO1	PO2
	b)	By applying the method of variation of parameters, solve the differential equation $\frac{d^2y}{dx^2}+a^2y=\sec ax.$	7 Marks	L3	CO1	PO1

UNIT-II

3.	a)	Form a partial differential equation by eliminating the arbitrary functions from $z=f(x-it)+g(x-it)$.	7 Marks	L3	CO1	PO2
	b)	Solve $x(z^2-y^2)\frac{\partial z}{\partial x}+y(x^2-z^2)\frac{\partial z}{\partial y}=z(y^2-x^2)$.	7 Marks	L3	CO1	PO1
		(OR)				
4.	a)	Analyze and solve the partial differential equation $\frac{\partial^2 z}{\partial x^2}-2\frac{\partial^2 z}{\partial x\partial y}+\frac{\partial^2 z}{\partial y^2}=\sin(2x+3y)$.	7 Marks	L3	CO1	PO2
	b)	Find the complete solution of the partial differential equation $\frac{\partial^2 z}{\partial x^2}+\frac{\partial^2 z}{\partial x\partial y}+\frac{\partial z}{\partial y}-z=e^{-x}$.	7 Marks	L5	CO1	PO2

UNIT-III

5.	a)	Show that the functions $u = xy + yz + zx, v = x^2 + y^2 + z^2$ and $w = x + y + z$ are functionally related. Find the relation between them.	7 Marks	L2	CO2	PO1
	b)	Apply partial derivative technique to find the stationary values for the function $x^2y^2 - 5x^2 - 8xy - 5y^2$ and decide at what points the function become maximum and minimum.	7 Marks	L1	CO2	PO2
		(OR)				
6.	a)	If $u = \frac{yz}{x}; v = \frac{zx}{y}; w = \frac{xy}{z}$, show that $\frac{\partial(u,v,w)}{\partial(x,y,z)} = 4$.	7 Marks	L2	CO2	PO1
	b)	By the technique of Lagrange's undetermined multipliers establish a minimum value for $x^2 + y^2 + z^2$ subject to the condition $xyz = a^3$.	7 Marks	L3	CO2	PO1

UNIT-IV

7.	a)	Evaluate $\int_0^5 \int_0^{x^2} x(x^2 + y^2)dxdy$.	7 Marks	L5	CO2	PO1
	b)	Change the order of integration in $\int_0^1 \int_{x^2}^{2-x} xydydx$ and hence evaluate the double integral.	7 Marks	L4	CO2	PO1
		(OR)				
8.	a)	Evaluate the integral, by the technique of transforming into polar coordinates. $\int_0^\infty \int_0^\infty e^{-(x^2+y^2)}dxdy$.	7 Marks	L5	CO2	PO2
	b)	Evaluate $\iint_R ydxdy$ where R is the region bounded by the parabolas $y^2 = 4x$ and $x^2 = 4y$.	7 Marks	L5	CO2	PO2

UNIT-V

9.	a)	Define the divergence of a vector point function and find $div\vec{f}$ where $\vec{f} = r^n\vec{r}$. Find **n** if it is solenoidal.	7 Marks	L1	CO3	PO1
	b)	Define directional derivative and find the directional derivative of $f = x^2 - y^2 + 2z^2$ at the point $P = (1,2,3)$ in the direction of the line PQ, where $Q = (5, 0, 4)$.	7 Marks	L1	CO3	PO1
		(OR)				
10.	a)	Define surface integral and evaluate $\int_S \vec{F} \cdot \vec{n}dS$ where $\vec{F} = z\vec{i} + x\vec{j} - 3y^2z\vec{k}$ and S is the surface $x^2 + y^2 = 16$ included in the first octant between $z = 0$ and $z = 5$.	7 Marks	L5	CO3	PO2
	b)	State Gauss divergence theorem and use it to evaluate $\iint (x\vec{i} + y\vec{j} + z^2\vec{k}).\vec{n}.dS$, where S is the surface bounded by the cone $x^2 + y^2 = z^2$ in the plane $z = 4$.	7 Marks	L3	CO3	PO2

CODE No.: 20BT1BS02 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Supplementary Examinations March – 2022

ENGINEERING CHEMISTRY

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		Define hardness of water and explain the estimation of hardness of water by EDTA method.	14 Marks	L2	CO1	PO1
		(OR)				
2.	a)	What are the ion exchange resins? Discuss about the ion exchange process.	9 Marks	L2	CO1	PO1
	b)	Write the specifications of potable water as per BIS and WHO standards.	5 Marks	L1	CO1	PO6
		UNIT-II				
3.		Apply the Schrodinger wave equation to the particle in one dimensional box.	14 Marks	L3	CO2	PO1
		(OR)				
4.	a)	Discuss the main postulates of molecular orbital theory.	10 Marks	L2	CO2	PO1
	b)	Write the Schrodinger wave equation and give the significance of Ψ and Ψ^2.	4 Marks	L1	CO2	PO1
		UNIT-III				
5.		Define corrosion and discuss various factors influencing the rate of corrosion.	14 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Describe the construction of Lithium ion batteries and mention its real life applications.	7 Marks	L2	CO3	PO1
	b)	Explain construction and working of H_2-O_2 fuel cell and write their drawbacks and applications.	7 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	Describe the various fundamental modes of molecular vibrations of IR spectroscopy.	8 Marks	L2	CO4	PO1
	b)	Recall the applications of TEM technique.	6 Marks	L1	CO4	PO1
		(OR)				
8.		State the Beer-lamberts law and explain the working of UV- spectrophotometer with block diagram.	14 Marks	L2	CO4	PO1
		UNIT-V				
9.	a)	Explain in detail about Fischer-Tropsch method for the manufacturing of synthetic petrol.	8 Marks	L2	CO5	PO1
	b)	Discuss the following properties of lubricants. i) Flash point and fire point. ii) Cloud point and pour point.	6 Marks	L2	CO5	PO1
		(OR)				
10.	a)	Discuss about the functions of lubricants and write a note on Solid lubricants.	8 Marks	L2	CO5	PO1
	b)	Calculate the Grass Calorific Value (GCV) and Net Calorific Value (NCV) of a sample of coal containing compositions 80% of Carbon; 7% of Hydrogen; 3.5% of Sulphur; 2.1% Nitrogen and 4.4% of ash.	6 Marks	L3	CO5	PO2

CODE No.: 20BT1BS03 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Supplementary Examinations March – 2022

ENGINEERING PHYSICS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Science)]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the necessary theory to determine the wavelength of a monochromatic light using Newton's ring method.	10 Marks	L2	CO1	PO1
	b)	In a Newton's rings experiment the diameter of the 15^{th} ring was found to be 0.59 cm and the 5^{th} ring was 0.36 cm. The radius of curvature of plano-convex lens is 100 cm, then predict the wavelength of light.	4 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Describe the construction and working of a Nicol's Prism.	10 Marks	L2	CO1	PO2
	b)	The refractive indices of mica for ordinary and extraordinary rays are 1.586 and 1.592 with a wavelength of 5460 **Å**. Predict the thickness of mica sheet to act as a quarter wave plate.	4 Marks	L1	CO1	PO2
		UNIT-II				
3.	a)	Outline the divergence and curl of electric and magnetic fields.	6 Marks	L2	CO2	PO1
	b)	Recall the principle behind the functioning of optical fiber. Derive an expression for acceptance angle of an optical fibre.	8 Marks	L3	CO2	PO2
		(OR)				
4.	a)	Using a block diagram, explain the optical fibre communication system.	10 Marks	L2	CO2	PO1
	b)	Summarise the applications of optical fibres.	4 Marks	L2	CO2	PO1
		UNIT-III				
5.	a)	Recall the concept of intrinsic and extrinsic semiconductors.	4 Marks	L1	CO3	PO1
	b)	Derive an expression for density of electrons in a conduction band of an intrinsic semiconductor.	10 Marks	L3	CO3	PO2
		(OR)				
6.	a)	State Hall effect. Derive an expression for Hall coefficient. Mention its applications.	10 Marks	L3	CO3	PO1
	b)	The R_H of a specimen is 3.66×10^{-4} m^3c^{-1}. Its resistivity is $8.93 \times 10^{-3}\Omega m$. Calculatemobility ($\mu$) and concentration (n) of the charge carriers.	4 Marks	L3	CO3	PO2
		UNIT-IV				
7.	a)	Develop the theory and expression for internal field experienced by an atom in a dielectric material due to an external filed.	10 Marks	L3	CO4	PO2
	b)	List any four applications of dielectrics.	4 Marks	L1	CO4	PO1
		(OR)				
8.	a)	Extend the discussion on hysteresis of ferro-magnetic materials.	7 Marks	L2	CO4	PO1
	b)	Define magnetic moment. Explain the origin of magnetic moment at the atomic level.	7 Marks	L2	CO4	PO2

UNIT-V

9.	a)	Explain Meissner effect. How it is used to classify Type-I and Type-II superconductors?	10 Marks	L2	CO5	PO2
	b)	List any four applications of superconductors.	4 Marks	L1	CO5	PO1
		(OR)				
10.	a)	Discuss the Physical, Optical and Magnetic properties of nanomaterials.	7 Marks	L2	CO5	PO1
	b)	Describe the pulsed laser deposition technique to synthesize nanomaterials.	7 Marks	L2	CO5	PO2

CODE No.: 20BT10101 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Supplementary Examinations March – 2022

ENGINEERING MECHANICS

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	An eye bolt is being pulled from ground by three forces as shown in Fig.1. Determine the resultant.	7 Marks	L4	CO1	PO1 PO2 PO6 PO10

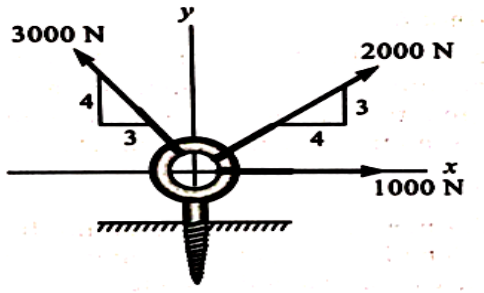


Fig.1

	b)	Calculate the reactions at the supports as shown in the given Fig.2.	7 Marks	L4	CO1	PO1 PO2 PO4 PO6 PO10

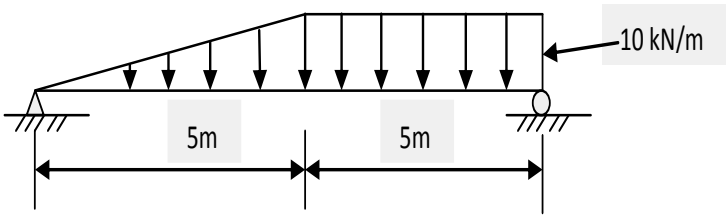


Fig.2

(OR)

2.	a)	Explain different of supports with neat sketch.	4 Marks	L1	CO1	PO1 PO10
	b)	What kind of frame is the given truss? Determine the forces in all the members of a truss shown in Fig.3. using method of joints.	10 Marks	L4	CO1	PO1 PO2 PO4 PO5 PO6 PO10

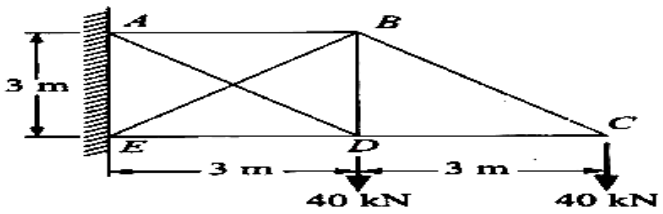


Fig.3

UNIT-II

3.	a)	Determine the frictional force developed on the block shown in the Fig.4. when P = 80 N. The coefficient of friction between block and floor is 0.3.	7 Marks	L4	CO2	PO1 PO2 PO4 PO6 PO10

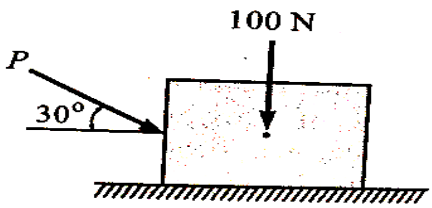


Fig.4

	b)	A block weighing 500 N just starts moving down a rough inclined plane when supported by a force of 200 N acting parallel to the plane in upward direction. The same block is on the verge of moving up the plane when pulled by a force of 300 N acting parallel to the plane. Find the inclination of the plane and the coefficient of friction between the inclined plane and the block.	7 Marks	L4	CO2	PO1 PO2 PO4 PO6 PO10

(OR)

4.	a)	A 100 N force acts as shown in the Fig.5. on a 300 N block placed on an inclined plane. The coefficient of friction between the block and plane is 0.25. Determine value of the friction force.	7 Marks	L4	CO2	PO1 PO2 PO4 PO6 PO10

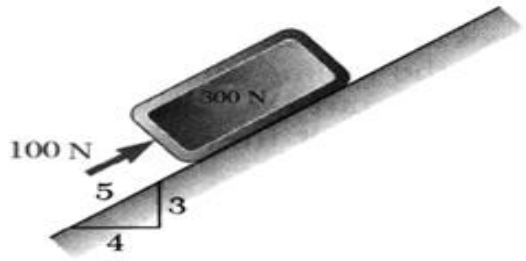


Fig.5

	b)	A ladder 4 m long and of 250 N weight is placed against a vertical wall in a position where its inclination to the vertical is 30^0. A man weighing 700 N climbs the ladder. At what position will he induce slipping? The co-efficient of friction for both the contact surfaces of the ladder with the wall and the floor is 0.2.	7 Marks	L4	CO2	PO1 PO2 PO4 PO6 PO10

UNIT-III

5.		For the composite area shown in the Fig.6, determine the position of the centroid.	14 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO10

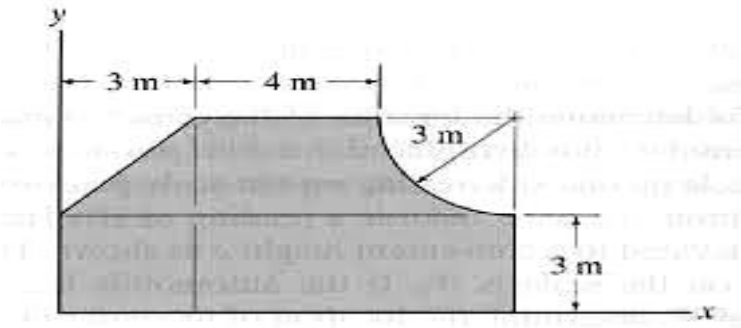
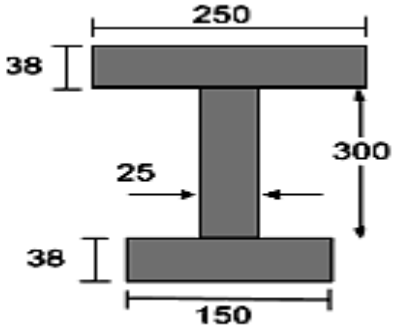


Fig.6

(OR)

6.		Determine the moment of inertia and the radius of gyration of the I - section shown in the Fig.7.	14 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO10



All dimensions are in mm.

Fig.7

UNIT-IV

7.	a)	State Poisson's Ratio. Obtain the volumetric strain of a rectangular bar and a cylindrical rod.	7 Marks	L4	CO4	PO1 PO2 PO10
	b)	A compound bar consist of a central steel strip 25 mm wide and 6.4 mm thick placed between two strips of brass each 25 mm wide and 't' mm thick. The strips are firmly fixed together to form a compound bar of rectangular section 20 mm wide and (2t + 6.4) mm thick. Determine i) The thickness of the brass strips which will make the apparent modulus of elasticity of compound bar 1.57×10^5 N/mm^2 and ii) the maximum axial pull the bar can then carry if the stress is not to exceed 157 N/mm^2, in either the brass or steel. Take the values of E for steel and brass as 2.07×10^5 N/mm^2 and 1.14×10^5 N/mm^2 respectively.	7 Marks	L4	CO4	PO1 PO2 PO4 PO5 PO6 PO10

(OR)

8.	a)	Derive the relationship between Modulus of Elasticity, Modulus of rigidity and Bulk Modulus.	10 Marks	L4	CO4	PO1 PO2 PO10
	b)	A 20 mm diameter brass rod was subjected to a tensile load of 40 kN. The extension of the rod was found to be 254 divisions in the length of 200 mm. If each division is equal to 0.001 mm, find the elastic modulus of brass to indentify the elastic property.	4 Marks	L4	CO4	PO1 PO2 PO4 PO5 PO6 PO10

UNIT-V

9.	a)	A cylindrical shell 4 m long which is closed at the ends has an internal diameter of 1 m and a wall thickness of 15 mm. Calculate the circumferential and the longitudinal stresses induced and also the change in dimension of the shell if it is subjected to an internal pressure of 1.5 MN/m^2.	7 Marks	L4	CO5	PO1 PO2 PO4 PO5 PO6 PO10
	b)	Calculate the thickness of the metal required for a cast iron main 800 mm in diameter for water at a pressure head of 100 m if the maximum permissible tensile stress is 20 MN/m^2 and weight of water is 10 kN/m^3.	7 Marks	L4	CO5	PO1 PO2 PO3 PO4 PO5 PO6 PO10

(OR)

10.		The external diameter of steel collar is 240 mm and internal diameter is decreased by 0.15 mm when shrunk on to a solid steel shaft of 150 mm diameter. Find : i) Radial pressure between the collar and the shaft. ii) Circumferential stress at the inner surface of the tube. iii) Reduction in diameter of the shaft. Take: E= 205 GN/m^2, and μ= 0.304.	14 Marks	L4	CO5	PO1 PO2 PO4 PO5 PO6 PO10

❀ ❀ ❀

CODE No.: 20BT10201 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Supplementary Examinations March – 2022

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

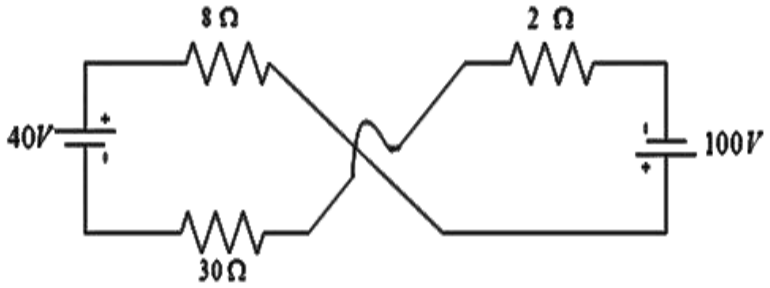
[Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Science)]

Time: 3 hours **Max. Marks: 70**

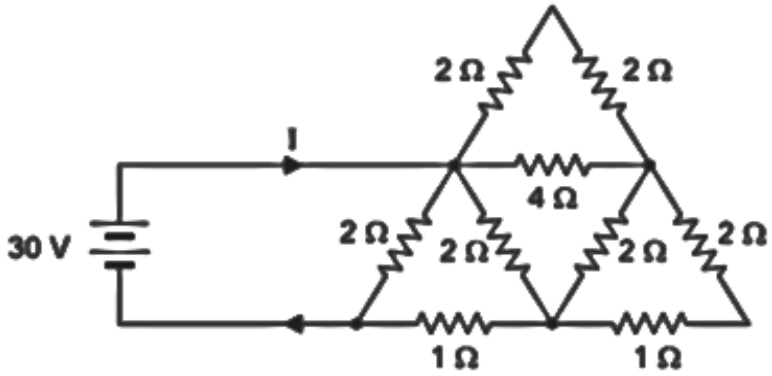
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	State and verify kirchhoff's voltage law for the given circuit.	7 Marks	L2	CO1	PO2



	b)	Determine the current (I) delivered by the source in the network.	7 Marks	L2	CO1	PO2



(OR)

2.	a)	A sinusoidal voltage v = 50 sin ωt is applied to a circuit. The current in the circuit is given by i = 25 sin (ωt-60^{o}). Determine the circuit elements, apparent power, average power, reactive power and power factor.	7 Marks	L2	CO1	PO2
	b)	With neat sketch, explain how the single phase sinusoidal waveform is generated with relevant principles.	7 Marks	L2	CO1	PO1

UNIT-II

3.	a)	With neat sketch, explain the typical layout of electrical grid.	4 Marks	L2	CO2	PO1
	b)	Explain the significance of power factor and enumerate the methods of improving the power factor.	7 Marks	L2	CO2	PO1
	c)	What are the various BEE standards that have to be considered while manufacturing any electrical product?	3 Marks	L2	CO2	PO8

(OR)

4.	a)	With a neat sketch, explain the operation of thermal power plant in detail. Also, comment on the impact of thermal power plant operation on environment.	11 Marks	L2	CO2	PO7
	b)	Explain the significance of Energy Efficiency ratio which needs to be followed while rating an appliance.	3 Marks	L2	CO2	PO8
		UNIT-III				
5.	a)	Derive the **emf** equation of single phase transformer.	7 Marks	L2	CO3	PO1
	b)	Explain the construction of permanent magnet DC motor.	7 Marks	L2	CO3	PO1
		(OR)				
6.		Explain the constructional details and working of stepper motor. List the applications of stepper motor.	14 Marks	L2	CO3	PO1
		UNIT-IV				
7.		Explain the operation of a half-wave-rectifier without filter and derive the expressions for ripple factor, % regulation, Efficiency and PIV.	14 Marks	L2	CO4	PO2
		(OR)				
8.	a)	Explain the V-I characteristics of Zener diode and draw the waveform.	7 Marks	L2	CO4	PO1
	b)	Describe the significance of the terms, ‘α’ and ‘β’. Establish a relation between them.	7 Marks	L2	CO4	PO1
		UNIT-V				
9.	a)	Discuss in detail about level translator and its significance in the circuits	7 Marks	L2	CO4	PO1
	b)	Construct a circuit to realize $V_{out} = V_1+V_2-V_3$ using Op-Amp.	7 Marks	L3	CO4	PO3
		(OR)				
10.	a)	Explain the working of a comparator using Op-Amp. What are its limitations?	7 Marks	L2	CO4	PO1
	b)	Explain why an Op-Amp is called operational amplifier. What mathematical operations can be performed using Op-Amp?	7 Marks	L2	CO4	PO2

CODE No.: 20BT10301 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Supplementary Examinations March – 2022

MATERIAL SCIENCE AND ENGINEERING

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss briefly the following structures for metallic elements: i) Body centered cubic. ii) Face centered cubic. iii) Hexagon close-packed.	7 Marks	L1	CO1	PO1
	b)	Demonstrate the Edge and Screw dislocations with neat sketches.	7 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Draw Fe-Fe_3C phase diagram and explain the phase transformation reactions in the diagram.	8 Marks	L3	CO1	PO1 PO2
	b)	State Gibb's Phase rule. What is its importance?	6 Marks	L1	CO1	PO1

UNIT-II

3.	a)	Define annealing. Differentiate between full annealing and process annealing.	7 Marks	L1	CO1	PO1
	b)	Classify the various types of hardening treatments. Explain flame and induction hardening treatment.	7 Marks	L2	CO1	PO1 PO2
		(OR)				
4.	a)	Explain Time Temperature Transformation (TTT) diagram for eutectoid steel.	7 Marks	L2	CO1	PO1 PO2
	b)	Carburizing heat treatment is generally done on low carbon steels. Why?	7 Marks	L3	CO1	PO1 PO2

UNIT-III

5.	a)	List the properties and applications of Stainless and Tool steels.	7 Marks	L1	CO2	PO1
	b)	Draw the micro structure of plain carbon steels and write the applications of it.	7 Marks	L3	CO2	PO1 PO2
		(OR)				
6.	a)	What are different types of cast irons? Draw the micro structure of any two types of cast irons. Give composition and applications of each.	7 Marks	L2	CO2	PO1 PO2
	b)	Interpret the effect of alloying elements on properties of steels.	7 Marks	L2	CO2	PO1 PO2

UNIT-IV

7.	a)	State and describe some of the important properties of nonferrous metals and alloys.	7 Marks	L1	CO2	PO1
	b)	Differentiate between brasses and bronzes in view of properties and applications.	7 Marks	L3	CO2	PO1 PO2
		(OR)				
8.	a)	Explain the composition, properties and uses of Titanium alloys.	7 Marks	L2	CO2	PO1
	b)	What is aluminium? Explain the types, properties and uses of aluminium alloys in detail.	7 Marks	L1	CO2	PO1

UNIT-V

9.	a)	What are ceramics? How ceramics are classified? Write the advantages and applications of ceramics.	7 Marks	L1	CO2	PO2
	b)	Describe properties and applications of polymers.	7 Marks	L1	CO2	PO1
		(OR)				
10.	a)	Briefly explain various properties and applications of Fiber reinforced composites.	7 Marks	L2	CO2	PO1
	b)	Write short notes on Metal Matrix composites and Ceramic-matrix composites and write few words on its impact on environmental.	7 Marks	L1	CO2	PO1 PO7

CODE No.: 20BT10341 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Supplementary Examinations March – 2022

BASIC CIVIL AND MECHANICAL ENGINEERING

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What is surveying? State its objectives and uses.	7 Marks	L1	CO1	PO1
	b)	The following staff readings were observed successively with a level. The instrument has been shifted after the second and fifth reading: 0.675, 1.230, 0.750, 2.565, 2.225, 1.935, 1.835, 3.220 The first reading was taken with staff held on benchmark of RL 100.000 m. Enter the readings in a page of level book and calculate the RL of all points. Apply arithmetic checks.	7 Marks	L4	CO1	PO1 PO2 PO10
		(OR)				
2.	a)	Describe the properties of good bricks.	7 Marks	L1	CO1	PO1 PO8
	b)	Briefly explain system of forces.	7 Marks	L1	CO1	PO1 PO10

UNIT-II

3.	a)	Distinguish between load bearing wall and partition wall.	7 Marks	L4	CO1	PO1 PO2
	b)	Define bearing capacity of soil and explain briefly about various types of settlement in soil.	7 Marks	L1	CO1	PO1 PO6
		(OR)				
4.	a)	What is rainwater harvesting? Explain about types of rainwater harvesting systems.	8 Marks	L2	CO1	PO1 PO5 PO7
	b)	Briefly explain the classification of dams.	6 Marks	L4	CO1	PO1 PO2

UNIT-III

5.		Explain the working principle of 2 stroke diesel engine with neat sketch.	14 Marks	L2	CO2	PO1
		(OR)				
6.		Describe the working principle of impulse turbine with neat sketch.	14 Marks	L2	CO2	PO1

UNIT-IV

7.		Derive the expression for length of the open belt drive.	14 Marks	L2	CO2	PO1 PO2
		(OR)				
8.	a)	Differentiate between gear drives and belt drives.	7 Marks	L1	CO2	PO1
	b)	Derive the expression for power transmitted by the simple gear train.	7 Marks	L2	CO2	PO1 PO2

UNIT-V

9.	Give an illustrative explanation of casting process. Summarize the factors influencing the quality of finished casting.	14 Marks	L2	CO2	PO1
	(OR)				
10.	Describe the process of turning and taper turning operations performed on a lathe.	14 Marks	L2	CO2	PO1

CODE No.: 20BT11201 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Supplementary Examinations March – 2022

PROGRAMMING FOR PROBLEM SOLVING

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Science), Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the data types in C language with example.	7 Marks	L2	CO1	PO1
	b)	Define unary operators. How many operands are associated with unary operator explain with suitable example?	7 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Explain Arithmetic, Logical, Relational and Conditional Operators with example.	7 Marks	L2	CO1	PO1
	b)	Write a C program to find the simple interest for the given amount, time and rate of interest.	7 Marks	L3	CO1	PO3
		UNIT-II				
3.	a)	Compare pre-test and post-test loops with an example.	7 Marks	L2	CO1	PO2
	b)	Write a C program to perform arithmetic operations using switch statement.	7 Marks	L3	CO1	PO3
		(OR)				
4.	a)	Define flowchart. Draw the flowchart to check whether a number given by the user is odd or even.	7 Marks	L2	CO2	PO3
	b)	Explain the top-down design technique for solving the given problem.	7 Marks	L2	CO2	PO5
		UNIT-III				
5.	a)	Write a C program to sort the given list of numbers.	7 Marks	L2	CO3	PO3
	b)	Write a C program to find the factorial of a given number. Define a separate function to find factorial.	7 Marks	L3	CO3	PO3
		(OR)				
6.	a)	Compare and contrast the storage classes.	7 Marks	L2	CO3	PO2
	b)	Write a C program to find a sub-string in a main string.	7 Marks	L3	CO3	PO3
		UNIT-IV				
7.	a)	Write a C Program to Add 'N' numbers using Pointers.	7 Marks	L2	CO3	PO3
	b)	Explain different types of dynamic memory allocation functions.	7 Marks	L3	CO3	PO1
		(OR)				
8.	a)	Write a C Program to Sort a list of Names using Array of Pointers.	7 Marks	L3	CO4	PO3
	b)	Differentiate Call by value and Call by Reference.	7 Marks	L2	CO4	PO2
		UNIT-V				
9.	a)	With an example, explain how to declare and access structure members.	7 Marks	L2	CO5	PO1
	b)	Write a C program to Read, Display, Add and Multiply two Complex Numbers. (Note: Represent Complex Number using Structure)	7 Marks	L3	CO5	PO3
		(OR)				
10.	a)	Compare unions with structure.	7 Marks	L2	CO5	PO2
	b)	State Self-Referential Structure. Explain with an example.	7 Marks	L2	CO5	PO1

CODE No.: 20BT12901 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-20) Supplementary Examinations March – 2022

DISCRETE MATHEMATICAL STRUCTURES

[Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Show that the following premises are inconsistent. i) If jack misses any classes through illness, then he fails high school. ii) If jack fails high school, then he is uneducated. iii) If jack reads a lot of books, then he is not uneducated. iv) Jack misses many classes through illness and reads a lot of books.	8 Marks	L2	CO1	PO1
	b)	Write the following statements in symbolic form. i) If either Jerry takes Calculus or Ken takes Sociology, then Larry will take English. ii) If it rains today, then I buy an umbrella.	6 Marks	L3	CO1	PO4

(OR)

2.	a)	Construct the truth tables for : i) $[((P \rightarrow Q) \rightarrow R) \rightarrow S]$ ii) $((P \vee Q) \wedge (\sim R)) \leftrightarrow Q$	7 Marks	L3	CO1	PO3
	b)	Construct PDNF for P→((P→Q)∧~(~Q∨~P)) without using the truth table.	7 Marks	L3	CO1	PO3

UNIT-II

3.	a)	Determine the value of ***fog, gof, f^{-1}og*** for the functions f and g: R → R (set of real numbers) defined by $f(x) = x^2 - 2$, $g(x) = x + 4$.	7 Marks	L3	CO2	PO3
	b)	Show that the relation "Greater than or equal to" is a partial ordering on the set of integers.	7 Marks	L4	CO2	PO2

(OR)

4.	a)	Design the Hasse diagram on the set S= {1, 2, 3, 5, 6, 10, 15, 30} and the relation ≤ be such that x ≤ y is x divides y.	7 Marks	L4	CO2	PO4
	b)	Let the relation on set X = {1, 2, 3, 4, 5, 6} be given by {(1, 2), (1, 3), (1, 6), (2, 3), (3, 5), (3, 6), (4, 5), (5, 6)}. Find the Maximum Compatibility Block with matrixand also draw the graph.	7 Marks	L4	CO2	PO3

UNIT-III

5.	a)	With an example, explain monoid homomorphism preserves the property of invertibility.	7 Marks	L2	CO3	PO1
	b)	Find whether (z, +) and (z, *) satisfies Semi-group or not where z be the set of integers and addition, multiplication (+, *) are binary operations.	7 Marks	L3	CO3	PO2

(OR)

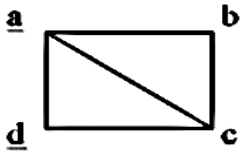
6.	a)	Let G={1, -1, i, -i} which form a group under multiplication and I = group of all integers under addition. Prove that the mapping $f: I \rightarrow G$ such that $f(x) = i^x$ for all $x \in I$ is a homomorphism.	7 Marks	L4	CO3	PO2
	b)	Show that any group G is abelian, if $(ab)^2 = a^2b^2$ for all a, b € R.	7 Marks	L4	CO3	PO2

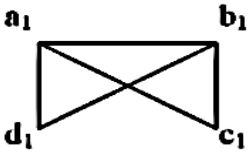
UNIT-IV

7.	a)	Find the general solution of the recurrence relation $\mathbf{a_n - 7a_{n-2} + 10_{n-4} = 0}$, for $n \geq 4$.	7 Marks	L3	CO4	PO4
	b)	Find the coefficient of x^{20} the function $\mathbf{(x^3 + x^4 + x^5 + \ldots..)^5}$.	7 Marks	L1	CO4	PO1
		(OR)				
8.	a)	How many 5 digit number can be composed of the digit in the number12334233.	7 Marks	L3	CO4	PO2
	b)	In how many ways a committee of 5 members can be formed from a group of 8 scientists, 6 psychologists and 4 philanthropists?	7 Marks	L3	CO4	PO2

UNIT-V

9.	a)	Prove that a complete graph K_n is planar if f $n \leq 4$.	7 Marks	L3	CO5	PO2
	b)	Explain Tree in detail with an example and list the properties and Applications of Trees.	7 Marks	L2	CO5	PO1
		(OR)				
10.	a)	Determine whether the following graphs are isomorphic.	7 Marks	L2	CO5	PO2





	b)	Prove that if a graph G has exactly two vertices of odd degree there is a path joining between these two vertices.	7 Marks	L4	CO5	PO2

❀ ❀ ❀

CODE No.: 16BT1BS01 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

ENGINEERING CHEMISTRY

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Four samples of water are collected at Naravari Palli (**NP**), Pullaiahgari Palli (**PP**), Kunchivari Palli (**KP**) and the other at Bandara Palli (**BP**). 100 ml of the each water sample collected at NP, PP, KP, and BP requires 28, 26, 20, 18 mL of EDTA solution on titrations respectively. 100 ml of SHW (0.28 gms of $CaCO_3$ per liter) requires 24 ml of EDTA solution on titration. Calculate and compare the degree of hardness and write the chemical reactions involved in titration.	8 Marks
	b)	Fluorides in water. Discuss effects on human Health and Nalgonda technique for deFluoridation of water.	6 Marks

(OR)

2	a)	Rishika want to investigate the reason for unforeseen explosion of Home boiler. After explosion the following deposits were found on analysis of boiler pieces. $CaSO_4$, $CaSiO_3$, $MgSiO_3$, Fe_2O_3, $Mg(OH)_2$, Na_2FeO_2, $CaCO_3$. Looking at the data Rishika, discussed about how boiler has suffered before explosion predicting the impurities present in water. Can you write the report discussing the attributes for explosion?	8 Marks
	b)	Write the chemistry of estimation of Water hardness by EDTA method? Discuss why PH = 10 is to be maintained.	6 Marks

UNIT-II

3	a)	Discuss the preparation, properties and uses of PTFE and PMMA Resin.	8 Marks
	b)	Explain engineering applications of conducting polymers.	6 Marks

(OR)

4	a)	Distinguish between thermo plastics and thermo sets.	7 Marks
	b)	Explain the conduction mechanism of polyaniline.	7 Marks

UNIT-III

5	a)	Discuss the synthesis of Biodiesel by Trans esterification method.	7 Marks
	b)	Enumerate advantages, disadvantages and important applications of Biodiesel.	7 Marks

(OR)

6	a)	Write informative notes on recent trends in Nano Technology and future trends of Green Chemistry.	10 Marks
	b)	Illustrate disadvantages of Nanomaterials.	4 Marks

UNIT-IV

7	a)	Distinguish Electrolytic cell and Electrochemical cell with neat diagrams and explain their in house and Industrial applications in your everyday life.	10 Marks
	b)	Explain the significance of the title of this outcome, “Energy from Electron Transfer.”	4 Marks

(OR)

8	a)	Using values from the table of standard reduction potentials, calculate the cell potentials, ∇G and log K under standard conditions of the following cells.
		i) $Al(s)/Al^{3+}(aq)//Ag^{+}(aq)/Ag(s)$
		ii) $Zn(s)/Zn^{2+}(aq)//Cr^{3+}(aq)/Cr(s)$
		iii) $Fe(s)/Fe^{2+}(aq)//Hg^{2+}(aq)/Hg(l)$
			6 Marks

	b)	Identify the type of battery that is truly the power behind everyday life. They start and power vehicles, back up uninterruptible operations like hospitals, railroad signals, weapons systems, and air traffic controls, and help electric utilities shift loads among grids. Explain the chemistry with neat diagram.	8 Marks

UNIT-V

9	a)	Analyze the possible means of rendering a metal cathodic to protect it from corrosion.	7 Marks
	b)	What is metallic corrosion? Pin holes on tin coated iron are more prone to corrosion of iron than those on zinc coated iron. Why?	7 Marks

(OR)

10	a)	How will you assess the situation and identify the type of corrosion from the physical manifestation of the corroded components / parts?	8 Marks
	b)	Discuss the functions of lubricants with suitable examples.	6 Marks

❀ ❀ ❀

CODE No.: 16BT1BS02 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

ENGINEERING PHYSICS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	With the help of suitable diagram, explain the principle, construction and working of an optical fiber as a wave guide.	10 Marks
	b)	In an optical fibre, the material has refractive indices of core and cladding of 1.6 and 1.3 respectively. What is the value of critical angle? Also calculate the acceptance angle and acceptance cone.	4 Marks
		(OR)	
2	a)	Classify the different types of optical fibers.	10 Marks
	b)	List the applications of optical fibers in various fields.	4 Marks

UNIT-II

3	a)	Explain the de-Broglie hypothesis of duality of material particles.	6 Marks
	b)	Derive time independent Schrodinger's wave equation for a free particle.	8 Marks
		(OR)	
4		Show that the energies of a particle in infinite potential box are quantized.	14 Marks

UNIT-III

5	a)	Explain direct and indirect band gap semiconducting materials.	6 Marks
	b)	What is the principle of LED? Describe the construction and working of LED.	8 Marks
		(OR)	
6	a)	Explain the **ac** frequency dependence of different polarizability in dielectrics.	5 Marks
	b)	Explain ionic and orientation polarization.	9 Marks

UNIT-IV

7	a)	Define: i) Super conductor. ii) Critical temperature. iii) Cooper pair.	4 Marks
	b)	Explain penetration depth in superconductivity. Write any five applications of superconductors.	10 Marks
		(OR)	
8	a)	Explain the BCS theory of superconductivity.	7 Marks
	b)	Explain Josephson effects and their applications.	7 Marks

UNIT-V

9	a)	Describe the principle factors which affect the properties of nanomaterials.	5 Marks
	b)	Explain in detail about the fabrication of nanomaterials by pulsed laser deposition.	9 Marks
		(OR)	
10	a)	Define nanomaterial. Give the classification of nanomaterials.	4 Marks
	b)	Discuss the synthesis of nanomaterial by using pulsed laser deposition method. List the applications of nanomaterials in various fields of science and technology.	10 Marks

❀ ❀ ❀

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations August - 2021

TRANSFORMATION TECHNIQUES AND PARTIAL DIFFERENTIAL EQUATIONS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Obtain the Fourier expansion of $x \sin x$ as a cosine series in $(0, \pi)$ and hence show that $\frac{1}{1.3} - \frac{1}{3.5} + \frac{1}{5.7} - \ldots = \frac{1}{4}(\pi - 2)$. 14 Marks

(OR)

2 Expand $f(x) = \begin{cases} \frac{1}{4} - x, & if \quad 0 < x < \frac{1}{2} \\ x - \frac{3}{4}, & if \quad \frac{1}{2} < x < 1 \end{cases}$ as a Fourier series of sine terms. 14 Marks

UNIT-II

3 Show that inverse finite Fourier sine transform of $F_s(n) = \frac{1}{\pi}\left\{1 + \cos n\pi - 2\cos\frac{n\pi}{2}\right\}$ is $f(x) = \begin{cases} 1, & 0 < x < \pi/2 \\ -1, & \pi/2 < x < \pi \end{cases}$. 14 Marks

(OR)

4 Find the Fourier sine and cosine transforms of $f(x) = \frac{e^{-ax}}{x}$ and deduce that $\int_0^\infty \frac{e^{-ax} - e^{-bx}}{x} \sin sx dx = \tan^{-1}(s/a) - \tan^{-1}(s/b)$. 14 Marks

UNIT-III

5 a) Using convolution theorem, evaluate $L^{-1}\left(\frac{s}{(s^2 + a^2)^2}\right)$. 7 Marks

b) Using Laplace Transform method solve $(D^2 + 1)y = \sin t \sin 2t$, $t > 0$, if $y = 1$, $Dy = 0$ when $t = 0$. 7 Marks

(OR)

6 a) Find the inverse transform of (i) $\log\left(\frac{s+3}{s+4}\right)$ and (ii) $\cot^{-1} s$. 7 Marks

b) Solve by Laplace Transforms, $\frac{d^3y}{dx^3} + 2\frac{d^2y}{dx^2} - \frac{dy}{dx} - 2y = 0$, $y(0) = 1$, $y'(0) = y''(0) = 2$. 7 Marks

UNIT-IV

7 a) Write the initial value theorem and using it find u_1, u_2 from $U(z) = \frac{4z^2 + 5z + 14}{(z-1)^4}$. 7 Marks

b) Find by applying the properties of Z – transforms 7 Marks
(i) $Z\left[na^n\right]$ and (ii) $Z\left[n^2a^n\right]$.

(OR)

8 a) Apply shifting theorem, evaluate $Z\left[\cos(n+1)\theta\right]$. 7 Marks

b) Applying Z-transforms, solve the difference equation $\mathbf{u_{k+2} - 2u_{k+1} + 3u_k = 2^k}$ with $u_0 = 2$, $u_1 = 1$. 7 Marks

UNIT-V

9 The points of trisection of a tightly stretched string of length l with fixed ends are pulled aside through a distance d on opposite sides of the position of equilibrium and the string is released from rest. Construct a mathematical expression for the displacement of the string at any subsequent time and show that the midpoint of the string is always at rest. 14 Marks

(OR)

10 a) Solve the linear differential equation $\mathbf{(x^2 - yz)\,p + (y^2 - zx)\,q = z^2 - xy.}$ 7 Marks

b) Solve the equation $x^2\frac{\partial u}{\partial x} + y^2\frac{\partial u}{\partial y} = 0$ by applying method of separation of variables. 7 Marks

CODE No.: 16BT20101 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

BUILDING MATERIALS AND CONSTRUCTION TECHNOLOGY

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Why you choose stone as a building material?	4 Marks
	b)	Analyze the characteristics of good stone.	5 Marks
	c)	List out the types of tests on stones.	5 Marks
		(OR)	
2	a)	Write down the tests on bricks and their purposes.	4 Marks
	b)	Define the term frog.	5 Marks
	c)	Summarize the names of bricks for special use.	5 Marks

UNIT-II

3		Illustrate the different kinds of lime available for use in construction works.	14 Marks
		(OR)	
4		Describe the preparation of lime mortar.	14 Marks

UNIT-III

5		Describe the types of hot rolled steel sections and cold formed steel sections.	14 Marks
		(OR)	
6		Associate the various uses of aluminum with respect to construction works.	14 Marks

UNIT-IV

7	a)	Define bearing capacity and safe bearing capacity of the soil. Sketch the following types of foundations and briefly discuss. i) Grillage Foundation. ii) RCC Raft Foundation.	7 Marks
	b)	List the classification of stone masonry with neat sketches. Show any four joints in stone masonry.	7 Marks
		(OR)	
8	a)	Write a short notes on: i) Cavity walls. ii) Partition walls.	7 Marks
	b)	Why brick masonry is preferred over stone masonry?	7 Marks

UNIT-V

9	a)	Explain briefly: i) Stucco plastering. ii) Lath plastering.	7 Marks
	b)	Illustrate the objectives of plastering. List the requirements of good plaster.	7 Marks
		(OR)	
10	a)	List the constituents of the paint and mention their specific function.	7 Marks
	b)	List the different alternative building materials and explain briefly any two of them.	7 Marks

CODE No.: 16BT20102 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

ENGINEERING MECHANICS
[Civil Engineering, Mechanical Engineering]

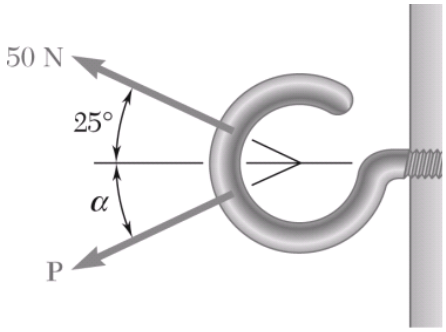
Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

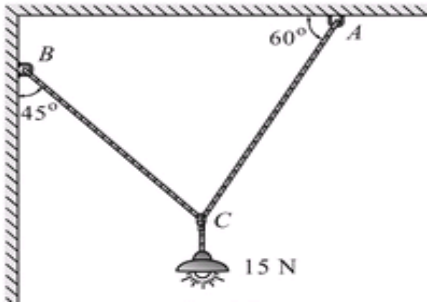
UNIT-I

1 a) If the maximum and minimum resultant forces of two forces acting on a particle are 40 kN and 10 kN respectively, then what would be the type of two forces? 3 Marks

b) Two forces are applied as shown to a hook support. Knowing that the magnitude of **P** is 35 N, determine the required angle α, if the resultant R of the two forces applied to the support is to be horizontal. 4 Marks



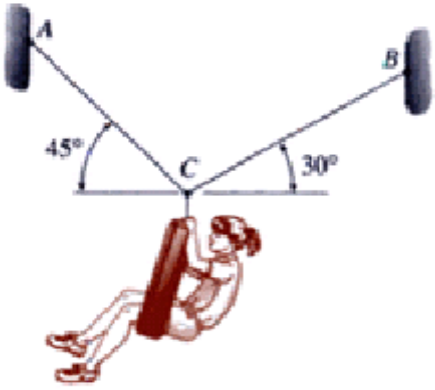
c) An electric light weighing 15N hangs from a point C by two strings AC and BC as shown in the figure, AC is inclined at 60^0 to the horizontal and BC at 45^0 to the vertical as shown. Find the forces in the strings AC and BC. 7 Marks



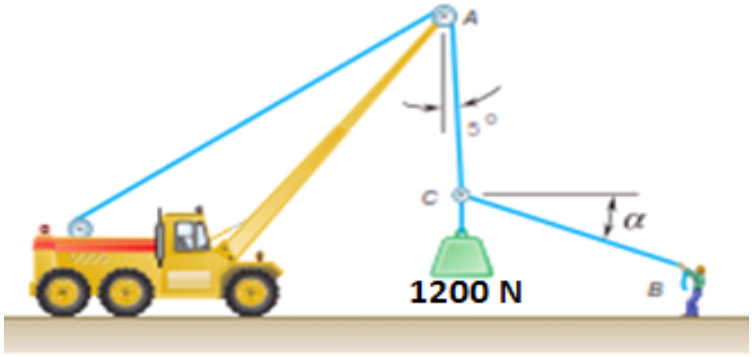
(OR)

2 a) State and explain Lami's theorem. 3 Marks

b) A girl is sitting in an old automobile tire which is suspended as shown. If the girl and the tire together have a mass of 60 kg, determine the tensions in the ropes AC and BC. 5 Marks



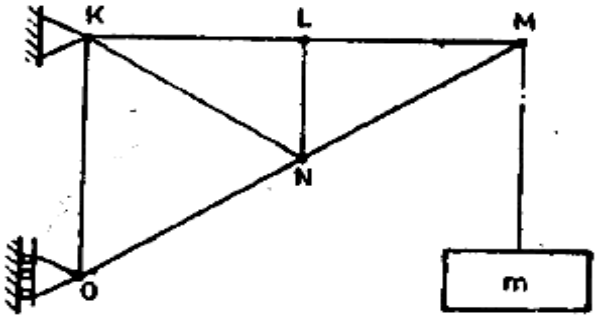
c) Knowing that $\alpha = 20^0$, determine the tension: 6 Marks
i) in cable AC, ii) in rope BC.



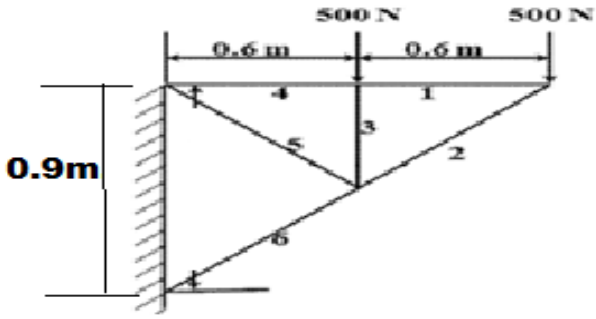
UNIT-II

3 a) What are the common types of supports used in two dimensions? Explain the support reactions with suitable sketches. 3 Marks

b) The figure shows a pin-jointed plane truss loaded at the point M by hanging a mass of 100 kg. Determine the load in members LN and NK of the truss. 4 Marks

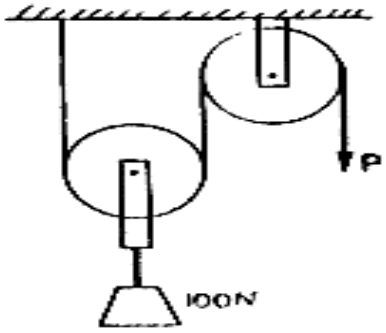


c) Determine the axial force in each bar of the plane truss loaded as shown in the figure. 7 Marks

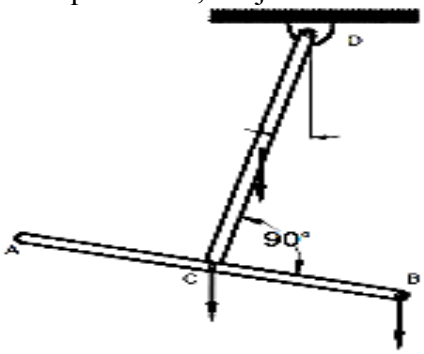


(OR)

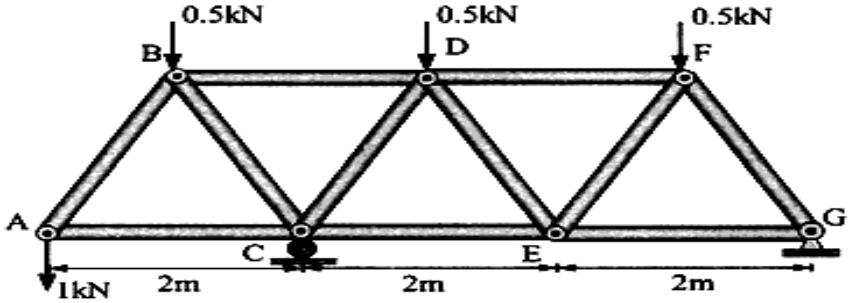
4 a) Using the principle of virtual work, determine the effort P required to hold the weight of 100N in equilibrium in a system of two frictionless pulleys of the same diameter as shown in figure. 3 Marks



b) A rigid **T** is made out of metal bars AB and CD as shown in figure each 1.4 m long and weigh 40 kg and 30 kg respectively. It is supported in to a vertical plane. Compute angle **α** for equilibrium, subjected to a load of 500N at B. 5 Marks

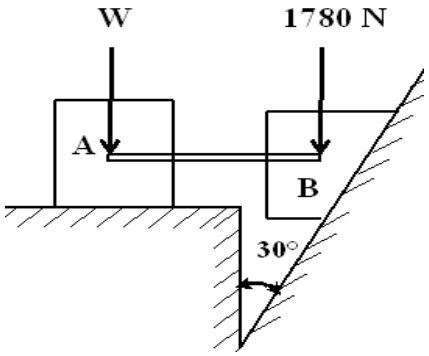


c) Using method of sections determine the forces in members BD and CD of the truss as shown in fig. All triangles are equilateral. 6 Marks

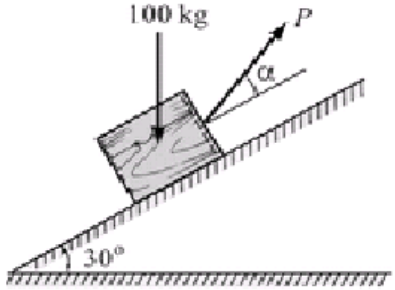


UNIT-III

5 a) Two blocks connected by a horizontal link AB are supported on two rough planes as shown in figure. The coefficient of friction for block A on the horizontal plane is μ=0.4. The angle of friction for block B on the inclined plane is φ=15°. What is the smallest weight W of block A for which equilibrium of the system can exist? 7 Marks

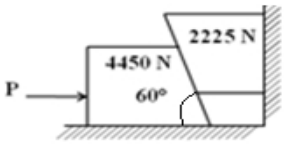


b) Determine the minimum value of force P required to cause motion of a 100 kg block to impend upon a 30° plane shown in figure. The coefficient of friction is 0.2. 7 Marks



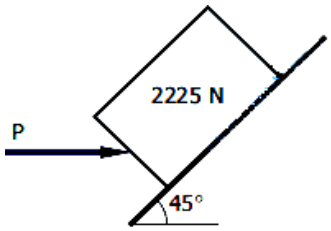
(OR)

6 a) Referring to the figure the coefficient of friction is as follows: 8 Marks
0.25 at the floor, 0.30 at the wall, 0.20 between the blocks. Find the minimum value of a horizontal force P applied to the lower block that will .hold the system in equilibrium.



b) The 2225 N block shown in figure P-507 is in contact with 45° incline. The coefficient of static friction is 0.25. Compute the value of the horizontal force P necessary to 6 Marks

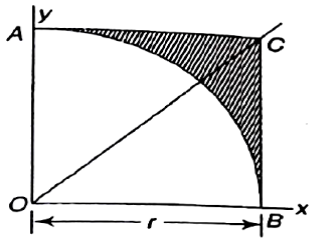
i) just start the block up the incline.
ii) just prevent motion down the incline.



UNIT-IV

7 a) Define the terms Polar Moment of Inertia with suitable sketch. 3 Marks

b) Calculate the polar moment of inertia about 'O' of the shaded area shown in the figure. 6 Marks

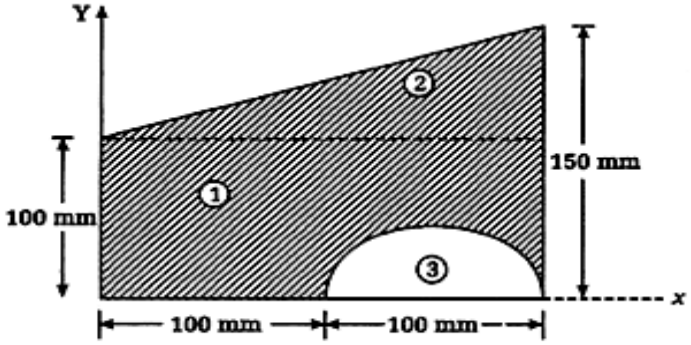


c) Explain the method of finding the centroids of composite area with suitable example. 5 Marks

(OR)

8 a) State the difference between centroid and center of gravity. 3 Marks

b) A semi-circular area is removed from the trapezium as shown in the figure. Determine the centroid of the remaining shaded area. (All dimensions in mm). 7 Marks



c) State and explain Pappus-Guldinus theorems for surface of revolution and volume of revolution. 4 Marks

UNIT-V

9 a) i) State impulse-momenutum priniciple. 4 Marks

ii) A bullet of mass1kg if fired with a velocity of ***u*** m/s from a gun of mass 10kg. Find the ratio of kinetic energies of bullet and gun.

b) A vehicle of mass 600 kg and moving with a velocity of 12 m/s strikes another vehicle of mass 400 kg, moving at 9 m/s in the same direction. Both the vehicles get coupled together due to impact. Find the common velocity with which the two vehicles will move. Also find the loss of kinetic energy due to impact. 3 Marks

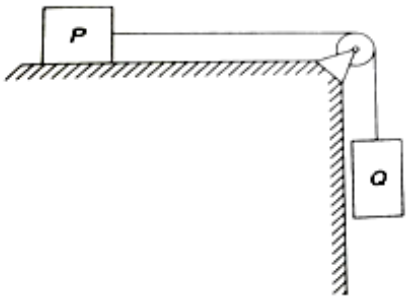
c) A car of mass 1500 kg is uniformly accelerated. Its speed increases from 50kmph to 75kmph after travelling a distance of 200m. The resistance to the motion of the car is 0.2% of the weight of the car. Determine (i) the maximum power required, (ii) the power required to maintain a constant speed of 75kmph. 7 Marks

(OR)

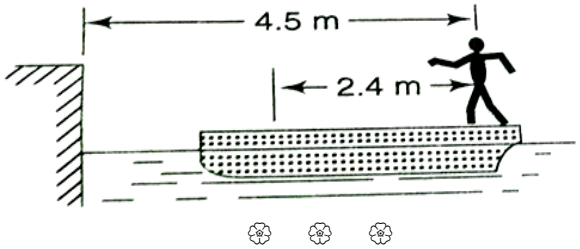
10 a) i) A car starts from rest with a constant acceleration of 4m/sec^2. Determine the distance travelled in the 7th second. 4 Marks

ii) A fly wheel of 550mm diameter is brought uniformly from rest to a speed of 350 r.p.m in 20 sec. Find velocity and acceleration of a point on its rim 3 seconds after starting from rest.

b) Two blocks of weights P and Q are connected by a flexible but inextensible cord and supported as shown in Fig. If the coefficient of friction between the block P and the horizontal surface is μ and all other friction is negligible, find (i) the acceleration of the system and (ii) the tensile force S in the cord. The following numerical data are given: P= 53.4N; Q=26.7N; μ=1/3. 5 Marks



c) A man weighing 712N stands in a boat so that he is 4.5m from a pier on the shore as shown in figure. He walks 2.4m in the boat toward the pier and then stops. How far from the pier will be at the end of this time? The boat weighs 890N, and there is assumed to be no friction between it and the water. 5 Marks



CODE No.: 16BT20241 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
[Civil Engineering, Mechanical Engineering]

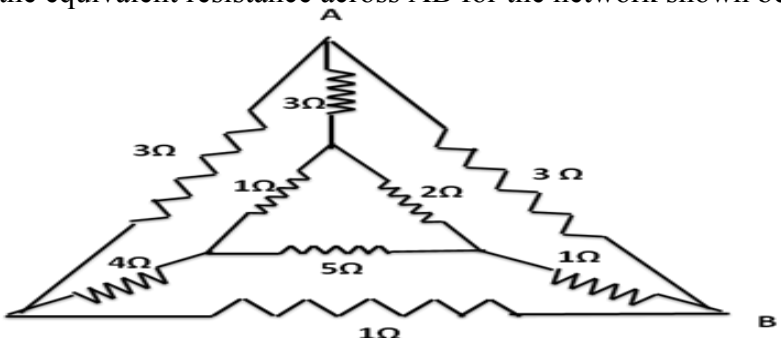
Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1 a) State and explain the Kirchhoff's laws with suitable examples. 7 Marks

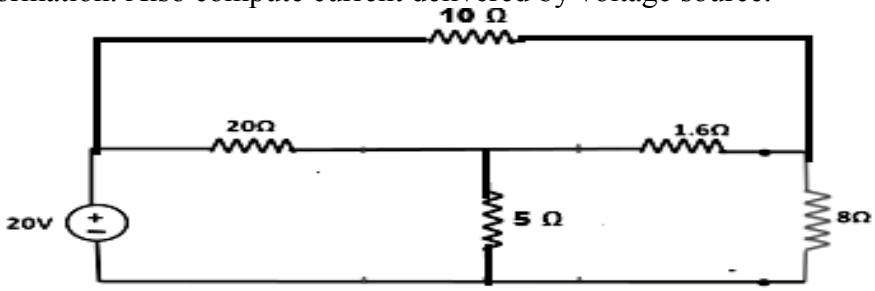
b) Compute the equivalent resistance across AB for the network shown below. 7 Marks



(OR)

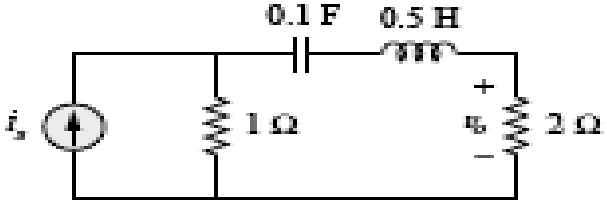
2 a) State and explain the terms node, loop, path with examples. 6 Marks

b) Compute the equivalent resistance across voltage source using star/delta transformation. Also compute current delivered by voltage source. 8 Marks

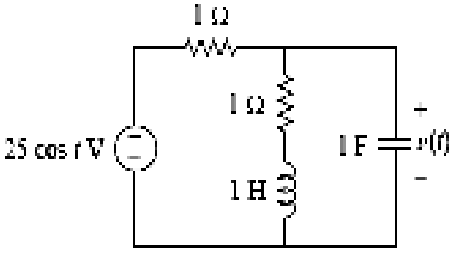


UNIT-II

3 a) If the voltage across 2 Ω resistor V_0 = -5 cos 2t, Compute the source current i_s. And also draw the phasor diagram representing source current and V_0. 7 Marks



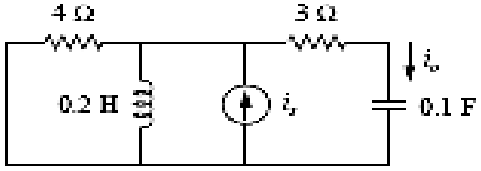
b) Compute the V(t), shown in figure below. 7 Marks



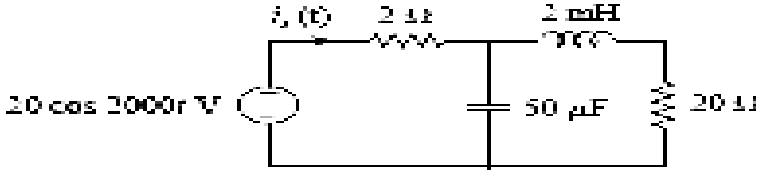
(OR)

4 a) If I_s = 20 sin (10t+15^0) A in the circuit shown in figure, compute the current 7 Marks

passing through capacitor i_0.



b) Compute the $I_s(t)$, circuit shown in figure below. Also compute the power delivered by voltage source. Represent the voltage and current relations in phasor diagram. 7 Marks



UNIT-III

5 a) Explain the construction of a single-phase transformer. 5 Marks

b) A transformer has 600 primary turns connected to a 1.5 kV supply. Determine the number of secondary turns for a 240 V output voltage, assuming no losses. 6 Marks

c) State the reason for transformer is rated in kVA not in KW. 3 Marks

(OR)

6 a) Explain how torque is developed in DC Motor. 5 Marks

b) Write the expression for the torque produced by DC Motor. 3 Marks

c) A 230V motor has an armature circuit resistance of 0.6 Ω. If the full load armature current is 30 A and no load armature current is 4 A, find the change in back E.M.F from no load to full load. 6 Marks

UNIT-IV

7 a) Define the transducer. 3 Marks

b) State and explain the basic requirements of transducer. 4 Marks

c) State and explain the principle operation of load cell. 7 Marks

(OR)

8 a) State the need for data acquisition system, explain the data acquisition system with the help of block diagram. 7 Marks

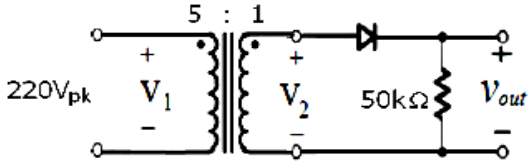
b) Explain the principle operation of LVDT with the help of neat sketch. 7 Marks

UNIT-V

9 a) Explain the diode acting as switch. 6 Marks

b) A 5:1 transformer is connected to a half wave rectifier circuit with a 50 kΩ load. 8 Marks

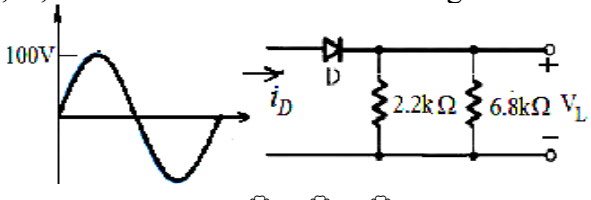
Find i) V_p; ii)I_p; iii) I_{dc}; iv) I_{ac}. In put voltage is 220 V_{pk}.



(OR)

10 a) State and explain the terms Peak Inverse Voltage (PIV), ripple factor, efficiency and regulation of full wave rectifier. 7 Marks

b) The circuit shown in figure had excited by sinusoidal waveform, compute the voltage across the load and current passing through 6.8 kΩ. Also draw the waveforms of V_L, I_L, V_D and I_D. Assume diode acting as ideal. 7 Marks



CODE No.: 16BT20401 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

ELECTRONIC DEVICES AND CIRCUITS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Explain the operation of a p-n junction diode in forward biased and reverse biased condition. Draw its V-I characteristics. 14 Marks

(OR)

2 Draw the circuit of a half-wave-rectifier without filter and derive the expressions for ripple factor, % regulation, Efficiency and PIV. 14 Marks

UNIT-II

3 Define Early-effect; explain why it is called as base-width modulation. Discuss its consequences in transistors in detail. 14 Marks

(OR)

4 a) With reference to bipolar junction transistors, define the following terms and explain. 7 Marks
   i) Emitter efficiency.
   ii) Base Transportation factor.
   iii) Large signal current gain.

   b) How transistor acts as an amplifier? 7 Marks

UNIT-III

5 Draw the circuit diagram of CC amplifier using hybrid parameters and derive expressions for A_I, A_V, R_i, R_O. 14 Marks

(OR)

6 Draw the circuit diagram and small signal equivalent of CB amplifier using accurate h-parameter model. Derive expressions for A_V, A_I, R_i and R_0. 14 Marks

UNIT-IV

7 a) Explain the operation of FET with its characteristics and explain the different regions in transfer characteristics. 10 Marks

   b) Give the classifications of FETs and their application areas. 4 Marks

(OR)

8 With the help of neat sketches and characteristic curves, explain the construction and operation of a JFET and mark the regions of operation on the characteristics. 14 Marks

UNIT-V

9 Explain the tunneling phenomenon. Explain the characteristics of tunnel diode with the help of necessary energy band diagrams. 14 Marks

(OR)

10 Explain about : 14 Marks
   i) Varactor diode.
   ii) Schottky Barrier diode with necessary sketches.

❀ ❀ ❀

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

BASIC ELECTRONIC DEVICES AND CIRCUITS

[Computer Science and Engineering, Information Technology and Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Determine the ripple factor of an L-section filter comprising a 10H choke and 8μF capacitor, used with a FWR. The DC voltage at the load is 50V. Assume the line frequency as 50Hz. 14 Marks

(OR)

2 A full wave rectifier circuit uses two silicon diodes with a forward resistance of 20Ω each. A DC voltmeter connected across the load of 1KΩ reads 55.4 volts. Calculate: 14 Marks

i) Irms.
ii) Average voltage across each diode.
iii) Ripple factor.
iv) Transformer secondary voltage rating.

UNIT-II

3 Design a self-bias circuit using silicon transistor to achieve a stability factor of 10, with the following specifications: 14 Marks

V_{CC} = 16V, V_{BE} = 0.7V, V_{CEQ} = 8V, I_{CQ}=4 mA and β= 50.

(OR)

4 a) If the base current in a transistor is 20μA when the emitter current is 6.4mA, what are the values of αdc and βdc? Also determine the collector current. 8 Marks

b) Draw the input and output characteristics of a transistor in common emitter configurations. 6 Marks

UNIT-III

5 a) A self biased p – channel JFET has a pinch – off voltage of V_P = 5 V and I_{DSS}=12 mA. The supply voltage is 12 V. Determine the values of R_D and R_S so that I_D = 5 mA and V_{DS} = 6V. 10 Marks

b) Sketch the drain characteristics of MOSFET for different values of V_{GS} and mark different regions of operation. 4 Marks

(OR)

6 a) In an n-channel FET, the effective channel width is 3 x 10^{-4}cm and the donor impurity concentration is 1015 electrons/cm^3. Find the pinch-off voltage. 8 Marks

b) Explain how a FET can be made to act as a switch. 6 Marks

UNIT-IV

7 Explain pierce crystal oscillator and derive the equation for oscillation. 14 Marks

(OR)

8 Explain with the relevant information, how the negative feedback improves stability, reduce noise and increase input impedance. 14 Marks

UNIT-V

9 Give the construction details of UJT and explain its operation with the help of equivalent circuits. 14 Marks

(OR)

10 What is the photo diode? Explain its principle of operation and applications in detail. 14 Marks

❀ ❀ ❀

CODE No.: 16BT20541 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

FOUNDATIONS OF DATA STRUCTURES

[Electrical and Electronics Engineering, Electronics and Communication Engineering and Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1	a)	Illustrate the operation of BUCKET-SORT on the array A = <79, 13, 16, 64, 39, 20, 89, 53, 71, 42> by specifying the algorithm. Prove that sorting n elements with integer keys in the range 1<= key<= m takes O(m + n) time using bucket sort.	7 Marks
	b)	Sort the sequence 8, 1, 4, 1, 5, 9, 2, 6, 5 by using Quick sort.	7 Marks
		(OR)	
2	a)	Design Shellsort routine using Shell's increments. Trace Shellsort after each pass for an array A = <81, 94, 11, 96, 12, 35, 17, 95, 28, 58, 41, 75, 15>	7 Marks
	b)	Trace the insertion sort algorithm with the given set of 6 numbers 44, 8, 74, 51, 32, 21 by Showing the passes and position moved. Derive the Worst case and Best case running time of Insertion Sort. What is the running time of insertion sort if all elements are equal?	7 Marks

UNIT-II

3	a)	What is a Stack? Explain any three operations performed on a Stack with required algorithms.	7 Marks
	b)	What is enqueue and dequeue? What are the applications of Queue? Explain.	7 Marks
		(OR)	
4	a)	Can you write a condition to check whether the stack is full or empty?	7 Marks
	b)	What is priority Queue? Explain.	7 Marks

UNIT-III

5	a)	Write the structure and enqueue( ) / insert( ) function and dequeue()/delete( ) function for a linked queue.	7 Marks
	b)	Explain the structure of a doubly linked list. Write an algorithm for inserting and deleting an element from doubly linked list. Illustrate the routines with examples.	7 Marks
		(OR)	
6	a)	Write functions to perform the operations of push( ), pop( ) and search() over Linked Stack	7 Marks
	b)	Differentiate singly linked list and circularly linked list.	7 Marks

UNIT-IV

7	a)	Show the result of inserting the following keys into an initially empty 2-3 tree: 3, 1, 4, 5, 9, 2, 6, 8, 7, 0.	7 Marks
	b)	Draw binary search trees of height 2, 3, 4, 5, and 6 on the set of keys {1, 4, 5, 10, 16, 17, 21}.	7 Marks
		(OR)	
8		Write routines to implement the basic binary search tree operations.	14 Marks

UNIT-V

9		Write the following C routines to implement Open Addressing Hash Table i) Initialization. ii) Find. iii) Insert. iv) Display.	14 Marks
		(OR)	
10	a)	Illustrate Connected Graph and Complete Graph. Give an example	7 Marks
	b)	Write a function to compute the hash values for a specific set of keys using the division/modulo method.	7 Marks

CODE No.: 16BT21201 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

OBJECT ORIENTED PROGRAMMING THROUGH C++

[Computer Science and Engineering, Information Technology and Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1	a)	Define the 'this' pointer with an example. Indicate the steps involved in referring to members of the invoking object.	7 Marks
	b)	Explain objected oriented concepts that are supported by a C++ program clearly giving the reasons why they are supported through examples.	7 Marks
		(OR)	
2	a)	Define object oriented programming and explain feature of object oriented programming. How it is different than procedure oriented programming?	7 Marks
	b)	Write the general form of function. Explain the different types of argument passing techniques with example.	7 Marks

UNIT-II

3	a)	What is the difference between global and local variables?	7 Marks
	b)	Explain the execution that takes place when an object is passed to a function as Pointer.	7 Marks
		(OR)	
4	a)	When will the destructor of an object does not get called during function execution?	7 Marks
	b)	Explain how in line function differs from pre processor macro. Explain significant advantages of Inline function.	7 Marks

UNIT-III

5	a)	Write a C++ program using this pointer.	7 Marks
	b)	Explain about objects and L-values with examples.	7 Marks
		(OR)	
6		Explain the use of constant pointers and pointers to constant with an example.	14 Marks

UNIT-IV

7	a)	Write a program that assigns the memory using the copy constructors every time an object is created while at the same time initialization of the newly created object is undertaken using some other object of the same type.	7 Marks
	b)	What rules do you follow when inserters and extractors are overloaded with reference to a class in which they are defined?	7 Marks
		(OR)	
8	a)	What operators cannot be overloaded as friend operators' functions? Explain the reasons.	7 Marks
	b)	Discuss different ways using which one object can be assigned to another object of the same type.	7 Marks

UNIT-V

9	a)	How can define I/O specific to a class? Explain.	7 Marks
	b)	Is hiding different from encapsulation explain through an example.	7 Marks
		(OR)	
10	a)	In what way overloaded regular functions are different from overloaded template functions explain.	7 Marks
	b)	List different ways using which polymorphism is implemented within C++.	7 Marks

❀ ❀ ❀

CODE No.: 16BT21501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

DIGITAL LOGIC DESIGN

[Computer Science and Engineering, Information Technology and Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1 Convert the following numbers from the given base to the other three bases indicated.
   i) Decimal 225.225 to binary and hexadecimal. 8 Marks
   ii) Octal 623.77 to decimal and hexadecimal. 6 Marks

(OR)

2 Convert the following numbers from the given base to the other three bases indicated.
   i) Binary 11010111.110 to decimal and octal. 6 Marks
   ii) Hexadecimal 2AC5.D to decimal and binary. 8 Marks

UNIT-II

3 a) Implement EX-OR using minimum number of NAND gates. 4 Marks
   b) Simplify the following Boolean function using K-map: 6 Marks
   $F(w, x, y, z) = \Sigma(0, 1, 2, 3, 7, 8, 10) + \Sigma(5, 6, 11, 15)$
   c) Obtain the simplified expression in sum of products for the given Boolean expression $F(x, y, z) = \Sigma(2, 3, 6, 7)$. 4 Marks

(OR)

4 Simplify the following expression using K-map and implement with two-level NAND gate circuit: $F = AB' + ABD + ABD' + A'C'D' + A'BC'$ 14 Marks

UNIT-III

5 a) Show that a full-subtractor can be constructed with two half-subtractors and an OR gate. 7 Marks
   b) A majority function is generated in a combinational circuit when the output is equal to 1, if the input variables have more 1's than 0's. The output is 0 otherwise. Design a 3 input majority function. 7 Marks

(OR)

6 a) Implement a full-adder using two half-adders and an OR gate. 7 Marks
   b) Design a combinational circuit with three inputs and one output. The output is equal to logic 1, when the binary value of the input is less than 3. The output is logic 0 otherwise. 7 Marks

UNIT-IV

7 a) Illustrate the functioning of an SR latch using two 2 input NOR gates. 7 Marks
   b) What is a characteristic equation? Obtain the characteristic equations for SR, JK, D and T flip-flops. 7 Marks

(OR)

8 a) Draw the circuit of JK flip-flop using NAND gates and explain its operation. 7 Marks
   b) What is the difference between an excitation table and a characteristic table? Give the excitation tables for SR, JK, T and D flip-flops. 7 Marks

UNIT-V

9 a) Differentiate between static RAM and Dynamic RAM. 6 Marks

b) Show how the PLA circuit would be programmed to implement the sum and carry outputs of a full-adder. 8 Marks

(OR)

10 Implement the following Boolean functions using PAL: 14 Marks

$F_1 = \Sigma m(0, 2, 5, 7, 8, 10, 12, 13)$; $F_2 = \Sigma m(0, 2, 6, 8, 9, 14, 15)$

CODE No.: 16BT1BS01 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations, January 2022

ENGINEERING CHEMISTRY

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the desalination of water by reverse osmosis method.	7 Marks
	b)	Reverse osmosis is advantageous over ion exchange process" justify the statement.	7 Marks
		(OR)	
2	a)	Explain Nalgonda method used for Defluoridation of water and list out the merits and demerits of various deflouridation methods.	7 Marks
	b)	What is the threshold level of fluoride in ground water? Discuss the adverse effects of fluorides on human health.	7 Marks

UNIT-II

3	a)	Write a brief note on: i) Conductive element filled polymer. ii) Blended conducting polymers with example.	7 Marks
	b)	Write the engineering applications of conducting polymers.	7 Marks
		(OR)	
4		What are conducting polymers? Classify the conducting polymers with examples. Differentiate the merits and demerits of Metals and conducting polymers.	14 Marks

UNIT-III

5		Summarize the tools used in Green Chemistry with examples.	14 Marks
		(OR)	
6	a)	Explain the role of Green Chemistry in our everyday life.	7 Marks
	b)	Write the synthesis of bio-diesel using Trans-esterification method.	7 Marks

UNIT-IV

7		Discuss the working principle, construction and applications of solid oxide fuel cells. How it is advantageous over other fuel cells?	14 Marks
		(OR)	
8		Demonstrate the working principle involved in bio-fuel cell and write its applications.	14 Marks

UNIT-V

9		Distinguish between: i) Galvanic corrosion ii) Concentration cell corrosion and explain the mechanism involved in these corrosion.	14 Marks
		(OR)	
10	a)	What are the functions of lubricants?	6 Marks
	b)	What is galvanizing? Illustrate the Nickel electroplating.	8 Marks

❀ ❀ ❀

CODE No.: 16BT1BS02 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

ENGINEERING PHYSICS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Elaborate the absorption, spontaneous emission and stimulated emission.	6 Marks
	b)	Describe the characteristics of a laser.	8 Marks
		(OR)	
2	a)	What do you understand by population inversion? How it is achieved?	5 Marks
	b)	Derive the relation between the Einstein coefficients of absorption and emission of radiation.	9 Marks

UNIT-II

3	a)	Derive one dimensional Schrodinger's time independent wave equation and discuss the physical significance of wave function.	12 Marks
	b)	Determine the wavelength of an electron when a potential of 100 V is applied.	2 Marks
		(OR)	
4	a)	Formulate Eigen function and Eigen values for the particle in one dimensional potential box of length 'L'.	12 Marks
	b)	Find the energy of an electron in second energy level. (L = 3Å).	2 Marks

UNIT-III

5	a)	Derive the expression for electron concentration in an intrinsic semiconductor.	8 Marks
	b)	Explain construction and working of solar cell.	6 Marks
		(OR)	
6	a)	Explain intrinsic and extrinsic semiconductors.	6 Marks
	b)	Obtain an expression for the electrical conductivity in semiconductors.	8 Marks

UNIT-IV

7	a)	Define Reverberation time. Outline Sabine's mathematical relation for reverberation time of the Hall. Write any three basic requirements of an acoustically good hall	10 Marks
	b)	A hall has a volume of 5000 m^3, it is required to have reverberation time of 1.5 sec. What should be the total absorption in the hall?	4 Marks
		(OR)	
8	a)	Discuss the various factors affecting the architectural acoustics of a building and their remedies.	8 Marks
	b)	Define the following. i) Reverberation. ii) Reverberation time. iii) Absorption coefficient. iv) Echelon effect.	6 Marks

UNIT-V

9	a)	Explain X- ray diffraction and derive Bragg's law.	7 Marks
	b)	Explain with suitable diagram the powder diffraction to determine the crystal structure.	7 Marks
		(OR)	
10	a)	Define Miller indices. How are they obtained?	4 Marks
	b)	Explain Bragg's law in crystal planes. Lattice constant of copper is 0.38nm. Calculate the distance between (110) planes.	10 Marks

❀ ❀ ❀

CODE No.: 16BT2BS01 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

TRANSFORMATION TECHNIQUES AND PARTIAL DIFFERENTIAL EQUATIONS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Obtain Fourier series for the function $f(x) = \begin{cases} \pi x, & 0 \le x \le 1 \\ \pi (2 - x), & 1 \le x \le 2 \end{cases}$ and hence deduce that $\frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \ldots = \frac{\pi^2}{8}$. 14 Marks

(OR)

2 Develop half range sine series for the function $f(x) = x$ range $0 < x < 2$. 14 Marks

UNIT-II

3 Find the Fourier transform of $e^{-a|x|}$ $(a > 0)$ and hence show that $\int_0^\infty \frac{\cos px}{a^2 + p^2} dp = \frac{\pi}{2a} e^{-a|x|}$. 14 Marks

(OR)

4 Find the finite sine transform of $f(x) = \begin{cases} -x, & x < c \\ \pi - x, & x > c \end{cases}$ where $0 \le c \le \pi$. 14 Marks

UNIT-III

5 a) Find $L^{-1}\left(\frac{1}{(s+2)^2 + 16}\right)$ and $L^{-1}\left(\frac{2s+3}{s^2 + 2s + 2}\right)$. 7 Marks

b) Using Laplace Transform, solve $\frac{d^2y}{dx^2} + 2\frac{dy}{dx} - 3y = \sin t$, $y(0) = y'(0) = 0$ when $t = 0$. 7 Marks

(OR)

6 State Convolution theorem of Laplace transform and applying it evaluate $L^{-1}\left(\frac{1}{s(s^2 + 2s + 2)}\right)$. 14 Marks

UNIT-IV

7 a) Define z – transform of f(n) and from the definition the Z-transform of $\left(\frac{1}{2}\right)^n + \left(\frac{1}{3}\right)^n$. 7 Marks

b) Show that $Z(\sin h\, n\theta) = \frac{z \sin h\theta}{z^2 - 2z \cos h\theta + 1}$. 7 Marks

(OR)

8 a) Find the inverse z – transform of $\frac{2z^2+3z}{(z+2)(z-4)}$. 7 Marks

b) Solve $\mathbf{u_{n+2}+4u_{n+1}+3u_n=3^n}$ with $\mathbf{u_0=0}$, $\mathbf{u_1=1}$ by using Z-transforms. 7 Marks

UNIT-V

9 a) Solve by the method of separation of variables $\frac{\partial u}{\partial x}=2\frac{\partial u}{\partial t}+u$, given $u(x,0)=6e^{-3x}$. 7 Marks

b) Establish an expression for the temperature distribution u(x,t) for the heat conduction equation $\frac{\partial^2 u}{\partial t^2}=c^2\frac{\partial^2 u}{\partial x^2}$ subject to the conditions $u(o,t)=0, u(l,t)=0, t>0$ and $u(x,0)=3\sin\left(\frac{\pi x}{l}\right), 0<x<l$. 7 Marks

(OR)

10 Given the wave equation $\frac{\partial^2 u}{\partial t^2}=c^2\frac{\partial^2 u}{\partial x^2}$, subject to the triangular deflection, $f(x)=\frac{2k}{l}x$ when $0<x<\frac{l}{2}=\frac{2k}{l}(l-x)$ when $\frac{l}{2}<x<l$. 14 Marks

Construct a formula for the displacement $u(x,t)$ at any point distance x from one end at time t.

CODE No.: 16BT20102 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations, January 2022

ENGINEERING MECHANICS

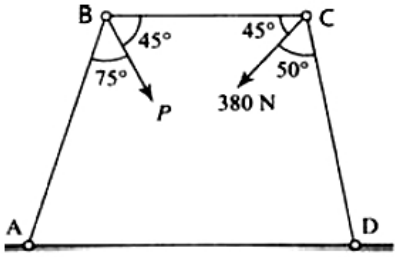
[Civil Engineering and Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

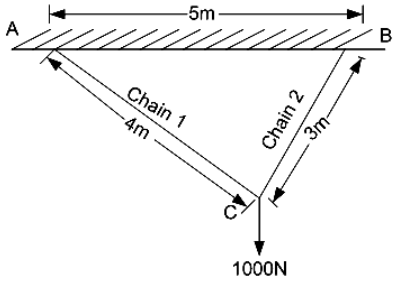
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) In the four bar mechanism ABCD, as shown in figure below, determine the force P for equilibrium. 7 Marks



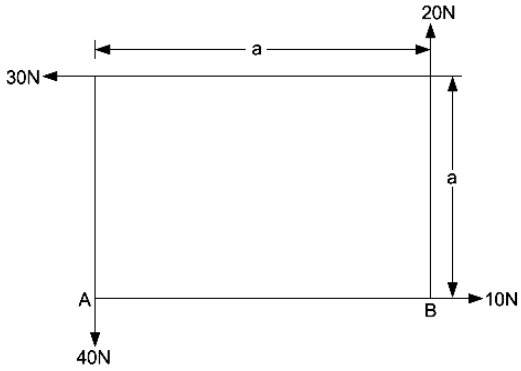
b) A weight of 1000 N is supported by two chains of lengths 4 m and 3 m as shown in figure. Determine the tension in each chain. 7 Marks



(OR)

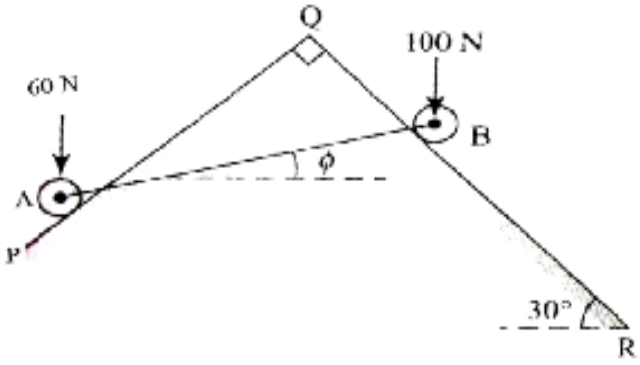
2 a) Forces 50 kN, 35 kN and 100 kN are concurrent at origin and are respectively directed through the points whose co-ordinates are M(3, 2, 4), N(4, -3, 6), P(-4, -2, 5) and Q (6, 3, -2). Determine the resultant of the system. 7 Marks

b) Four forces of magnitudes 10N, 20N, 30N and 40N are acting respectively along the four sides of a square ABCD as shown in Figure. Determine the magnitude, direction and position of the resultant force. 7 Marks



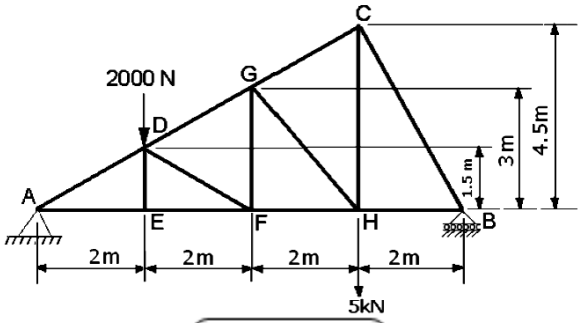
UNIT-II

3 Two spheres weighing 60 N and 100 N are connected by a flexible string AB and rest on two mutually perpendicular planes PQ and QR as shown in Figure. Find the tension in the string which passes freely through slots in smooth inclined planes PQ and QR using principle of virtual work. 14 Marks



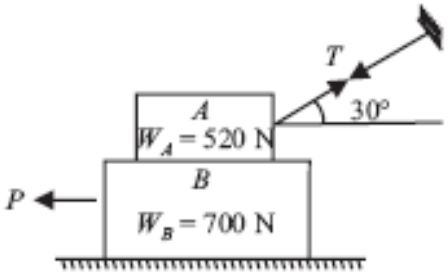
(OR)

4 Calculate the forces included in the members of the pin-jointed truss shown in figure. Show the values on a neat diagram of the truss. 14 Marks



UNIT-III

5 a) Block A of weight 520N rest on the horizontal top of block B having weight 700N as shown in figure. Block A is tied to a support C by a cable at 30º to the horizontal. Coefficient of friction is 0.4 for all contact surfaces. Determine the minimum value of the horizontal force P just to move the block B. Find also the tension in the cable. 7 Marks



b) Two equal bodies A and B of weight '**W**' each are placed on a rough inclined plane. The bodies are connected by a light string. If μA = 1/2 and μB = 1/3, show that the bodies will be both on the point of motion when the plane is inclined at $\tan^{-1}$ (5/12). 7 Marks

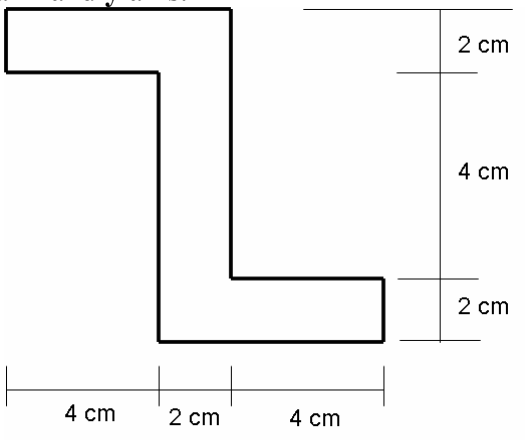
(OR)

6 a) A ladder 5 m long and of 250 N weight is placed against a vertical wall in a position where its inclination to the vertical is 30º. A man weighing 800 N climbs the ladder. At what position will he induce slipping. The co-efficient of friction for both the contact surfaces of the ladder viz. with the wall and the floor is 0.2. 7 Marks

b) A block weighing 100 N is resting on a rough plane inclined 20º to the horizontal. It is acted upon by a force of 50 N directed upward at angle of 14º above the plane. Determine the friction. If the block is about to move up the plane, determine the co-efficient of friction. 7 Marks

UNIT-IV

7 Calculate the moment of inertia of the composite section shown in figure with respect the centroidal **x** and **y** axis. 14 Marks



(OR)

8 a) Determine the coordinates of the centroid of the semicircular area whose radius is R. 7 Marks

b) Determine the coordinates of the centroid of a right triangle of base '**b**' and height '**h**'. 7 Marks

UNIT-V

9 a) A stone is dropped into a well with no initial velocity and 4.5 seconds later, the splash is heard. Then a second stone is thrown downward into the well with an initial velocity '**u**' and splash is heard 4 seconds later. If velocity of sound is constant at 336 m/s, determine the initial velocity of the second stone. 7 Marks

b) A bus starts from rest at point A and accelerates at the rate of 0.9 m/s^2 until it reaches a speed of 7.2 m/s. It then proceeds with the same speed until the brakes are applied. It comes to rest, at point B, 18 m beyond the point where the brakes are applied. Assuming uniform acceleration, determine the time required for the bus to travel from A to B. Distance between A and B is 90 m. 7 Marks

(OR)

10 a) A golfer hits a 46 gm ball with an initial velocity of 48 m/s at angle of 24º with the horizontal. Determine: 7 Marks

i) Initial KE of the ball.

ii) KE of the ball when it reaches its maximum height.

b) State and prove the Principle of conservation of momentum. 7 Marks

CODE No.: 16BT20241 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations January - 2022

BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

[Civil Engineering, Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Obtain the voltage V_{xy} in the circuit shown in Fig. 1.10. 7 Marks

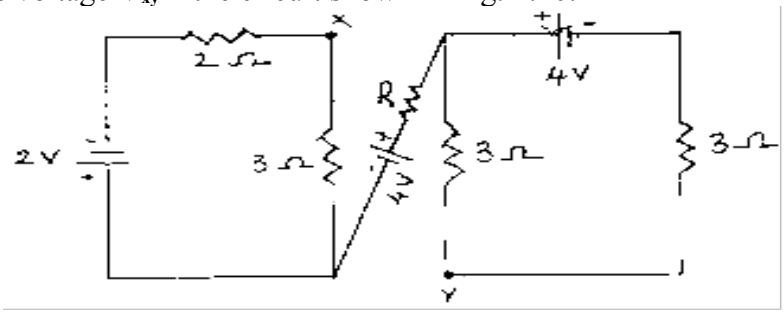


Fig. 1.10

b) In the circuit shown in Fig. 1.11, battery A has an emf of 110 V and internal resistance of 0.25 Ω. Determine the magnitude and direction of current in each battery and the total current taken from the supply. 7 Marks

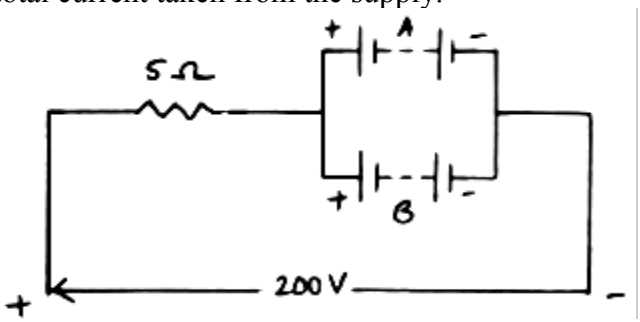


Fig. 1.11

(OR)

2 a) Find the resistance across the terminals X-Y and hence find the current in each branch of the circuit shown in Fig. 1.12. 7 Marks

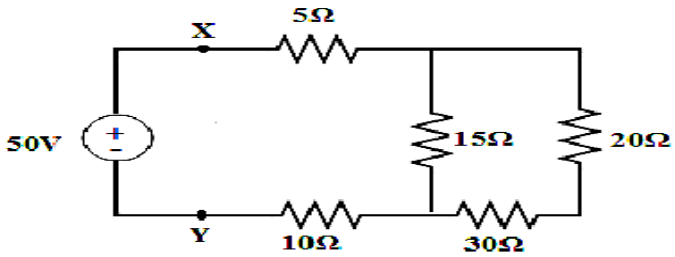


Fig. 1.12

b) Find the value of applied DC voltage for the network shown in Fig. 1.13. 7 Marks

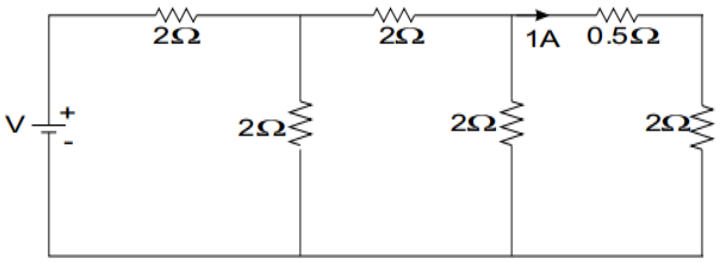


Fig. 1.13

UNIT-II

3		An ac generator with an internal impedance of (3+j2.4) Ω is connected to load impedance consisting of two impedances (12+j10) Ω & (16-j12) Ω in parallel. If the supply voltage is 100V, determine (i) the current in each branch(ii) the power in each branch(iii) the power factor of each branch (iv) the overall power factor and (v) the total power supplied. Sketch the complete phasor diagram.	14 Marks

(OR)

4	a)	Define reactive power, overall power and obtain expressions for them. Bring out their significance. Specify their units.	7 Marks
	b)	Two impedances Z_1=(50-j15)Ω and Z_2 = (15+j10)Ω are connected in series across a 200V, 50Hz supply. Find (i) Branch currents (ii) Total current (iii) Complex power and (iv) Total power.	7 Marks

UNIT-III

5		A 3-phase, 8 pole, 50Hz induction motor has a slip of 3% at full load. Find the synchronous speed and the frequency of rotor current at full load.	14 Marks

(OR)

6		A shunt generator delivers 50 kW at 250 V and runs at 400 r.p.m. The armature and field resistances are 0.02 Ω and 50 Ω respectively. Calculate the speed of the machine running as a shunt motor and taking 50 kW input at 250 V. Allow 1 V per brush for contact drop.	14 Marks

UNIT-IV

7		With neat sketch describe the various parts working principle of digital ammeter.	14 Marks

(OR)

8		Show that strain gauge factor is $G_f = 1+2\nu$.	14 Marks

UNIT-V

9	a)	Explain each term in a Diode current equation and draw V-I characteristics of p-n junction diode.	6 Marks
	b)	Derive the expressions for ripple factor, efficiency, TUF, percentage regulation of half wave rectifier.	8 Marks

(OR)

10	a)	Derive the expressions for ripple factor, efficiency, percentage regulation of bridge rectifier.	7 Marks
	b)	Design a filter for a full wave circuit with LC filter to provide an output voltage of 10 V with a load current of 200 mA and ripple factor of 0.02.	7 Marks

CODE No.: 16BT20401 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations January - 2022

ELECTRONIC DEVICES AND CIRCUITS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) The reverse saturation current of a silicon p–n function diode at an operating temperature of 27^0C is 50nA. Estimate the dynamic forward and reverse resistances of the diode for applied voltages of 0.8 V and -0.4 V respectively. 8 Marks

b) Distinguish between drift and diffusion current in a semiconductor. State continuity equation. 6 Marks

(OR)

2 a) Determine the dynamic forward and reverse resistance of p-n junction silicon diode when the applied voltage is 0.25 V at T=3000K with give I_0=2 μA. 7 Marks

b) Explain the concept of diode capacitance. Derive expression for transition capacitance. 7 Marks

UNIT-II

3 What are the compensation techniques used for V_{BE} and I_{CO}? Explain with the help of suitable circuits. 14 Marks

(OR)

4 a) For an NPN transistor with α_N = 0.98, I_{CO} = 2μA and I_{EO} = 1.6μA connected in Common Emitter Configuration, determine the minimum base current for which the transistor enters into saturation region. V_{CC} and load resistance are given as 12 V and 4.0 KΩ respectively. 7 Marks

b) Determine the significance of operating point, DC and AC load lines to ensure active region operation of a BJT in CE amplifier application. 7 Marks

UNIT-III

5 The h-parameters of a transistor used in a CE circuit are h_{ie} = 1.0K, $h_{re} = 10 \times 10^{-4}$, h_{fe} = 50, $h_{oe} = 1 \times 10^{-4}$. The load resistance for the transistor is 1K in the collector circuit. Determine R_i, R_o, A_V and A_i in the amplifier stage (Assume Rs = 1000). 14 Marks

(OR)

6 Derive the expression for A_v, A_i, Input impedance and Output impedance of CE amplifier using exact and approximate models. 14 Marks

UNIT-IV

7 a) A Common Source FET amplifier circuit with un bypassed RS has the following circuit parameters: R_d = 15K, R_S = 0.5K, R_g = 1M, R_d = 5K, g_m= 5mS and V_{DD}=20 V. Determine A_V and R_O. 10 Marks

b) Derive the expression for trans conductance of MOSFET. 4 Marks

(OR)

8 a) The P-channel FET has a $|I_{DS}|$ = -12mA, |Vp|=5V, V_{GS} is 1.6 V. Determine I_D, g_m and g_{m0}. 7 Marks

b) Explain the significance of threshold voltage of a MOSFET. Discuss the methods to reduce threshold voltage, V_T. 7 Marks

UNIT-V

9 Explain Schottky diode with necessary sketches. 14 Marks

(OR)

10 Explain the operation of tunnel diode and draw its equivalent circuit. 14 Marks

❀ ❀ ❀

CODE No.: 16BT20441 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

BASIC ELECTRONIC DEVICES AND CIRCUITS
[Computer Science and Engineering, Information Technology and Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Derive the expression for the ripple factor of π-Section filter when used with a Half-wave-rectifier. Make necessary approximations. 14 Marks

(OR)

2 a) Explain the temperature dependence of VI characteristics of PN diode. 7 Marks

b) Find the value of D.C resistance and A.C resistance of a Germanium junction diode at 25^0 C with reverse saturation current, Io = 25μA and at an applied voltage of 0.2V across the diode. 7 Marks

UNIT-II

3 Draw the self bias circuit and obtain the expression for the stability factor. Discuss the advantages and disadvantages of self biasing. 14 Marks

(OR)

4 a) Define 'Thermal Runaway' in transistors. Derive the condition to prevent 'Thermal Runaway' in Bipolar Junction Transistors. 8 Marks

b) Draw the input and output characteristic of a transistor in common collector configurations. 6 Marks

UNIT-III

5 a) Explain the construction and operation of a P-channel MOSFET in enhancement and depletion modes with the help of static drain characteristics and transfer characteristics. 10 Marks

b) Draw the Drain V-I characteristics for p-channel JFET. 4 Marks

(OR)

6 Explain the principle of CS amplifier with the help of circuit diagram. Derive the expressions for A_V, input impedance and output Impedance. 14 Marks

UNIT-IV

7 a) Explain with circuit diagram a negative feedback amplifier and obtain expressions for its closed loop gain. 8 Marks

b) The gain of an amplifier is decreased to 1000 with negative feedback from its gain of 5000. Calculate the feedback factor and the amount of negative feedback in dB. 6 Marks

(OR)

8 a) Sketch the block diagram of a feedback amplifier and derive the expressions for gain (i) with positive feedback and (ii) with negative feedback. State the advantages of negative feedback. 10 Marks

b) An amplifier, without feedback, has a voltage gain of 400, lower cut-off frequency f_1 = 50 Hz, upper cut off frequency f_2 = 200 KHz and a distortion of 10%. Determine the amplifier voltage gain, lower cut-off frequency and upper cut-off frequency and distortion, when a negative feedback is applied with feedback ratio of 0.01. 4 Marks

UNIT-V

9	Sketch the static characteristics and firing characteristics of SCR and explain the shape of the curve.	14 Marks
	(OR)	
10	Explain how a variable capacitance can be built using a varactor diode.	14 Marks

CODE No.: 16BT20541 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

FOUNDATIONS OF DATA STRUCTURES

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Define sorting and illustrate any two internal sorting algorithms in detail.	14 Marks

(OR)

2		Illustrate quick sort algorithm and identify the behavior of Quick sort when input is already sorted.	14 Marks

UNIT-II

3		Write a program to implement stack operations Using arrays.	14 Marks

(OR)

4		Construct the prefix and postfix form of the following given expression.	
		i) (A-B*C-D)/(E+F).	5 Marks
		ii) A+B*(C-D)/(P-R).	5 Marks
		iii) ((A+B)*C-(D-E) ^ (F+G)).	4 Marks

UNIT-III

5		Write a C program to create a single linked list and display the list in reverse order.	14 Marks

(OR)

6		Write a C program to perform following operation in a singly linked list. i) Create a list adding nodes at the front. ii) Delete a node at a given position.	14 Marks

UNIT-IV

7	a)	Give an algorithm for finding maximum element in binary tree.	7 Marks
	b)	Construct binary tree and identify the postorder from given inorder and preorder traversals. Inorder: D B E A F C Preorder: A B D E C F.	7 Marks

(OR)

8	a)	Explain the steps involved in converting the general tree to a binary tree, with an example.	7 Marks
	b)	Explain algorithms for binary tree traversals.	7 Marks

UNIT-V

9	a)	Define a graph and write about different types of graphs.	7 Marks
	b)	Explain in detail different ways of representing graphs.	7 Marks

(OR)

10		Describe in detail about depth first traversal of a graph with suitable example.	14 Marks

❀ ❀ ❀

CODE No.: 16BT21201 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations, January 2022

OBJECT ORIENTED PROGRAMMING THROUGH C++

[Computer Science and Engineering, Information Technology and Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit

All questions carry equal marks

UNIT-I

1		List the features of reference variables. Give an example program.	14 Marks
		(OR)	
2	a)	Define data abstraction.	2 Marks
	b)	How data abstraction is implemented in C++. Explain with an example.	12 Marks

UNIT-II

3		How nested conditional and loop statements are executed in C++. Explain with a suitable example.	14 Marks
		(OR)	
4		Define **break**, **continue**, **goto** statements, and nested select statement with a suitable example programs.	14 Marks

UNIT-III

5		Explain the concept of multi-dimensional arrays in C++ with an example.	14 Marks
		(OR)	
6		Name any five string manipulation functions in C++ explain with a suitable example.	14 Marks

UNIT-IV

7		Explain how **new** and **delete** operators manage memory allocation / deallocation dynamically.	14 Marks
		(OR)	
8	a)	How does the compile interpret the operator overloading?	7 Marks
	b)	Write a C++ program to overload unary minus to change the sign of each of its data items of an object.	7 Marks

UNIT-V

9		Create a simple file using constructor function and open function.	14 Marks
		(OR)	
10		Explain different file handling functions in C++.	14 Marks

CODE No.: 16BT21501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

DIGITAL LOGIC DESIGN

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Simplify the following Boolean expressions using the Boolean theorems. 14 Marks

i) (A+B+C) (B'+C) + (A+D) (A'+C)

ii) (A+B) (A+B') (A'+B)

(OR)

2 a) Discuss in brief about the basic theorems and properties of Boolean algebra. 8 Marks

b) Find the dual of the following functions. 6 Marks

i) (XY+Z)(Y+XZ) ii) (A'+B)(B'+C).

UNIT-II

3 A multiple output combinational logic circuit is defined by the following functions. Draw the schematic circuits for F_1 and F_2. 14 Marks

F_1 (A, B, C,D) = (A' • (A'D)')' • (A' + BC).

F_2 (A, B, C,D) = (A'D)'• (A' + BC).

Using K-Maps simplify F_1 and F_2 and draw the reduced diagram of that circuit.

(OR)

4 Obtain minimal SOP expression for the complement of the given expression: F(A, B, C) = Q (1, 2, 5, 7) And draw the circuit using NOR-gates. 14 Marks

UNIT-III

5 a) Define an encoder and design a circuit for 4-to-2 Bit Binary Encoder and 8-to-3 priority encoder. 7 Marks

b) Explain the basic operation of 4*1 Multiplexer. 7 Marks

(OR)

6 a) A combinational logic circuit is defined by the following Boolean functions. 7 Marks

F_1 = ABC + AC

F_2 = ABC + AB

F_3 = ABC + AB

Design the circuit with a decoder and external gates.

b) A combinational logic circuit is defined by the following Boolean functions. 7 Marks

F_1 =(ABC)' + AC

F_2 = A(BC)' + A'B

F_3 = AB'C + AB

Design the circuit with a decoder and external gate

UNIT-IV

7 a) Design a 4-bit register with parallel load using D flip-flops. 7 Marks

b) Explain the basic principles of Ripple Counter. 7 Marks

(OR)

8 a) What is a shift register? Explain about the following modes of operations in a four bit shift register (i) shift right (ii) shift left and (iii) bidirectional. 7 Marks

b) Distinguish between Ring and Johnson counters. Design and explain the operation of a decade Johnson counters. 7 Marks

UNIT-V

9 a) Draw and explain the block diagram of PAL. 7 Marks

b) Implement the following Boolean functions using PAL. 7 Marks

$w(A,B,C,D) = \Sigma m (0,2,6,7,8,9,12,13)$

$x(A,B,C,D) = \Sigma m (0,2,6,7,8,9,12,13,14)$

$y(A,B,C,D) = \Sigma m (2,3,8,9,10,12,13)$

$z(A,B,C,D) = \Sigma m (1,3,4,6,9,12,14)$.

(OR)

10 a) Explain the block diagram of a memory unit. Explain the read and write operation a RAM can perform. 8 Marks

b) i) How many 32K * 8 RAM chips are needed to provide a memory capacity of 256K bytes? 6 Marks

ii) How many lines of the address must be used to access 256K bytes? How many of these lines are connected to the address inputs of all chips?

iii) How many lines must be decoded for the chip select inputs? Specify the size of the decoder.

CODE No.: 16BT1BS01 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations June - 2022

ENGINEERING CHEMISTRY

[Electrical and Electronics Engineering, Electronics and Communication Engineering and Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

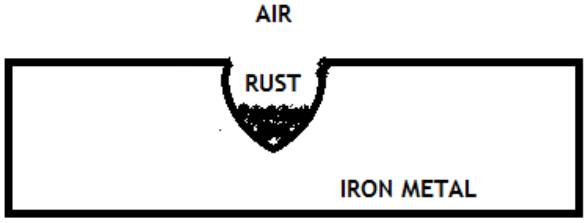
1	a)	Three samples of water are collected from Bandara palli (**BP**), Naravari Palli (**NP**) and Sree Sainath Nagar (**SSN**). 100 **mL** of the water sample collected at **BP** requires 34 **mL** of 0.01 M EDTA solution on titration. 100 mL of the water sample collected at **NP** required 48 ml of 0.01 M EDTA solution on titration. 100 **mL** of the water sample collected at **SSN** requires 15 **mL** of 0.01 M EDTA solution on titration. Discuss the result and suggest the sample which can be directly used for drinking w.r.to only Hardness (WHO standard: Hardness < 200 ppm of $CaCO_3$).	10 Marks
	b)	Why hard water consumes lot of soap? Explain your answer with chemical reactions.	4 Marks
		(OR)	
2	a)	Give the specifications of "Water for Steam Generation". Explain scale and sludge formation, Boiler corrosion.	7 Marks
	b)	DISCUSS ion exchange process of water softening with neat DIAGRAM. Give the chemical reactions where ever is necessary.	7 Marks
		UNIT-II	
3	a)	Explain the role of chemistry in Engineering materials with suitable examples.	7 Marks
	b)	Explain the conduction mechanism of polyaniline and its uses.	7 Marks
		(OR)	
4	a)	Discuss the role of polymers as water softeners with one example.	7 Marks
	b)	Discuss the Properties and classification of Bio-degradable polymers.	7 Marks
		UNIT-III	
5	a)	Write notes on: Use of alternative feedstocks. Use of innocuous Reagents.	8 Marks
	b)	Write informative notes on Recent trends in NANO TECHNOLOGY.	6 Marks
		(OR)	
6	a)	Discuss the synthesis of Biodiesel by Trans esterification method.	7 Marks
	b)	"IONIC LIQUIDS"- explain their role in green synthesis.	7 Marks
		UNIT-IV	
7	a)	Based on the chemistry that takes place; explain with neat diagram why Pb-Acid battery is called "secondary storage battery."	8 Marks
	b)	Explain the difference between a rechargeable battery and one that must be discarded. Use a NiCad battery and a dry cell as examples.	6 Marks
		(OR)	
8	a)	Distinguish Electrolytic cell and Electrochemical cell with neat diagrams and Discuss their applications in Engineering setting.	10 Marks
	b)	Fuel cells were invented in 1839, but never developed into practical devices for producing electrical energy until the U.S. space program in the 1960s. What advantages did fuel cells have over previous power sources?	4 Marks

UNIT-V

9	a)	i) When a coating is plated onto a metal, two different metals are in contact with each other. Why doesn't galvanic corrosion occur at this interface?	4 Marks
		ii) Aluminium is used extensively as a construction metal. What are two important properties of Al that make it particularly desirable for construction purposes?	3 Marks
		iii) Explain how corrosion can be considered as extractive metallurgy in reverse.	3 Marks
	b)	Discuss any two factors influencing rate of corrosion with suitable example.	4 Marks

(OR)

10	a)	The diagram below shows a piece of iron which has a small depression in its surface that has partly filled with RUST. "Pitting" of the metal has occurred! Explain in detail the mechanism of further corrosion of the metal in this case.	7 Marks



	b)	Discuss in detail the classification and properties of Lubricants.	7 Marks

CODE No.: 16BT1BS02 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations June - 2022

ENGINEERING PHYSICS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1	a)	Write characteristics of a LASER.	2 Marks
	b)	Describe the construction and working of a semi-conductor laser with neat diagram.	8 Marks
	c)	Differentiate optical fibers basing on refractive index.	4 Marks
		(OR)	
2	a)	Define population and population inversion.	2 Marks
	b)	Explain the construction and working of Nd:YAG LASER with a neat energy level diagram.	8 Marks
	c)	Describe the structure of an optical fiber.	4 Marks

UNIT-II

3	a)	Describe the potential energy of electron moving in one-dimensional lattice changes.	6 Marks
	b)	Explain the formation of energy bands in solids using electron potential energy versus inter atomic distance graph.	8 Marks
		(OR)	
4	a)	Identify reasons for good conductivity in conductors, insulating behaviour of bad conductors and intermediate electrical properties shown by semiconductors.	8 Marks
	b)	Define Fermi energy level, conduction band and valance band.	6 Marks

UNIT-III

5	a)	What are semiconductors? Distinguish between intrinsic and extrinsic semi-conductors.	6 Marks
	b)	Explain the mechanism of current flow in intrinsic semiconductor.	4 Marks
	c)	Describe the position of Fermi-energy level in intrinsic semiconductor.	4 Marks
		(OR)	
6	a)	Describe electrical conductivity of intrinsic, n-type, p-type semiconductors using bond model and respective figures.	8 Marks
	b)	Explain how donor impurities in semiconductors give rise to excess free electrons in n-type semiconductors with necessary band-diagram.	6 Marks

UNIT-IV

7	a)	Define Superconductivity. Mention the important property changes that occur in materials when they change from normal to superconducting state.	6 Marks
	b)	Describe type-I and type-II superconductors.	8 Marks
		(OR)	
8	a)	Define Meissner effect. Prove that Meissner effect and the disappearance of resistivity in a superconductor are mutually consistent.	8 Marks
	b)	Bring out the salient experimental features of superconductivity.	6 Marks

UNIT-V

9	a)	Write differences between crystalline and amorphous solids.	4 Marks
	b)	Write procedure of finding Miller Indices of a plane in a crystal.	4 Marks
	c)	Draw (132), (020) and (211) planes in a cubic crystal.	6 Marks

(OR)

10	a)	For a cubic crystal as values of the planar indices h, k, and l increases, does the distance between adjacent planes increases or decreases. Summarize the reason.	4 Marks
	b)	Mention wavelength range of X-rays and write their applications.	4 Marks
	c)	Write a short note on constructive and destructive interference of waves and write importance of Bragg's law of X-ray diffraction.	6 Marks

CODE No.: 16BT2BS01 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations June - 2022

TRANSFORMATION TECHNIQUES AND PARTIAL DIFFERENTIAL EQUATIONS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1 Draw the graph for $f(x) = 0$ for $-\pi < x < 0$ $= \sin x$ for $0 < x < \pi$ and also express f(x) as a Fourier series. 14 Marks

(OR)

2 Expand the function $f(x) = x \sin x$ as a Fourier series in the interval $-\pi \le x \le \pi$. 14 Marks

UNIT-II

3 Solve the integral equation $\int_0^\infty f(\theta)\cos\alpha\,\theta\,d\theta = \begin{cases} 1-\alpha; & 0 \le \alpha \le 1 \\ 0; & \alpha > 1 \end{cases}$. Hence evaluate $\int_0^\infty \frac{\sin^2(t)}{t^2}dt$. 14 Marks

(OR)

4 Determine Fourier transform of $f(x) = e^{-a^2x^2}$ for a > 0, and hence show that $e^{-\frac{x^2}{2}}$ is self reciprocal with respect to Fourier transforms. 14 Marks

UNIT-III

5 Find 14 Marks

(i) $L^{-1}\left\{\frac{6s-4}{s^2-4s+20}\right\}$; (ii) $L^{-1}\left\{\frac{1-e^{-\pi s/2}}{1+s^2}\right\}$.

(OR)

6 Evaluate $L^{-1}\left\{\frac{s}{(s^2+1)^2}\right\}$ by convolution property. 14 Marks

UNIT-IV

7 Find inverse Z-transform of $\frac{2z}{(z-1)(z^2+1)}$. 14 Marks

(OR)

8 Determine the inverse Z-transform of $\frac{2(z^2-5z+6.5)}{(z-2)(z-3)^2}$, for 2<|z|<3. 14 Marks

UNIT-V

9 Solve the first order linear partial differential equation (y+z)p - (z+x) q =x-y. 14 Marks

(OR)

10 Form the partial differential equation, by eliminating the arbitrary constants from $2z = \frac{x^2}{a^2} + \frac{y^2}{b^2}$. 14 Marks

❀ ❀ ❀

CODE No.: 16BT20102 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations June – 2022

ENGINEERING MECHANICS

[Civil Engineering, Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

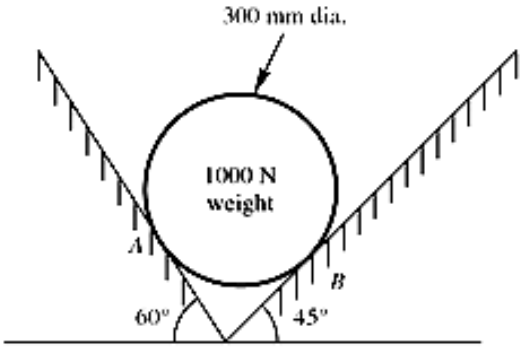
Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1 a) Explain different types of force systems with suitable examples. 4 Marks

b) forces A and B are acting at an angle θ. Their Two resultant 'R' will make an angle α with the force A. Determine the value of cos α. 3 Marks

c) A sphere of weight 1000 N rests in a V shaped groove, as shown in Fig. Determine the reactions exerted on the sides of the groove at A and B if all surfaces are perfectly smooth. 7 Marks



(OR)

2 a) Distinguish clearly between resolution of forces and composition of forces. 4 Marks

b) Two forces act at a point. The first force has x and y components of 3N and -5 N respectively. If the resultant of these forces falls on the x-axis and has a magnitude of -4 N then, find out the x and y components of the second force. 3 Marks

c) A body is acted upon by six forces as below. Find the resultant of magnitude and direction of these forces. 7 Marks

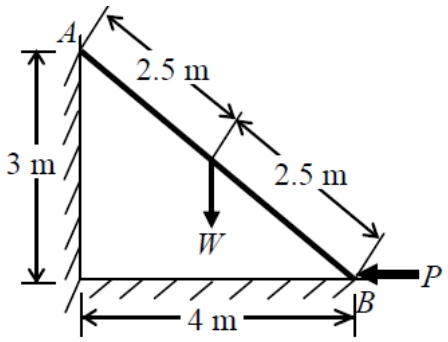
i) 50 N acting due East. ii) 100N 500 North of East.
iii) 75N 200 West of North. iv) 120N acting 300 south of West.
iv) 90N acting 250 West of South. vi) 80N acting 400 South of East.

All forces are acting from the point O.

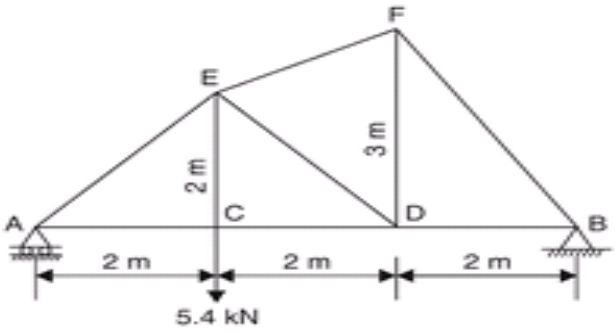
UNIT-II

3 a) Explain the concept of moment of a force about a point. For what condition the moment of a force will be zero. 3 Marks

b) A ladder AB of length 5 m and weight (W) 600 N is resting against a wall. Assuming frictionless contact at the floor (B) and the wall (A), find out the magnitude of the force P (in Newton) required to maintain equilibrium of the ladder. 4 Marks



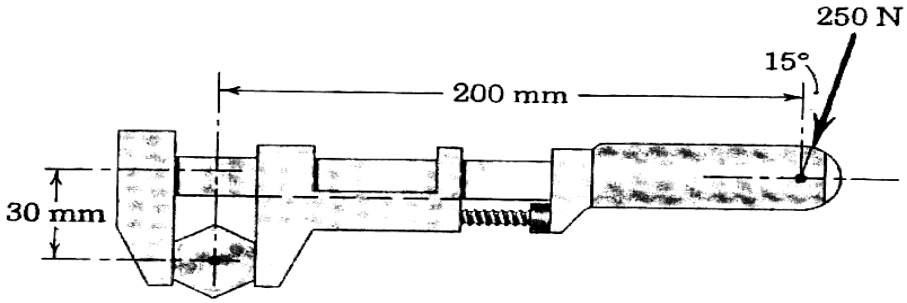
c) Find force in the members of the truss shown in fig. Use method of joints. 7 Marks



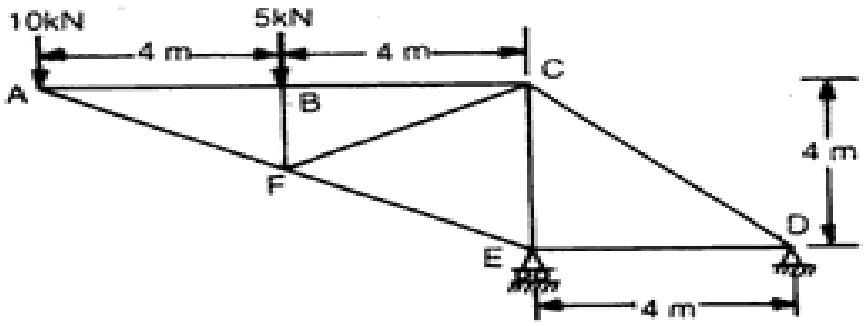
(OR)

4 a) Define truss and classify. State the assumptions involved in the analysis of a perfect truss. 3 Marks

b) Calculate the moment of the 250 *N* force on the handle of the monkey wrench about the centre of the bolt. 3 Marks

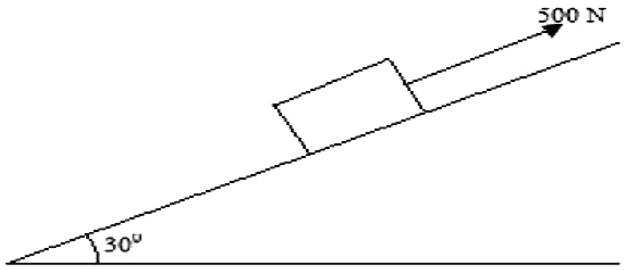


c) In the overhanging truss shown in fig. Determine the axial forces in all the members. 8 Marks



UNIT-III

5 a) The block shown in the given figure is kept in equilibrium and prevented from sliding down by applying a force of 500 N. The coefficient of friction is $\frac{\sqrt{3}}{5}$. Find weight of the block. 4 Marks

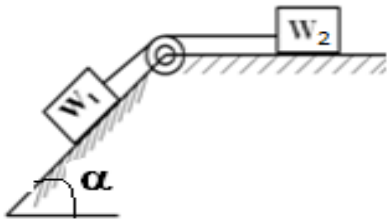


b) A ladder 5m long and 250N weight is placed against a vertical wall in a position where its inclination to the vertical is 30^{o}. A man weighing 800N climbs the ladder. At what position will he induce slipping? The coefficient of friction for both the contact surfaces of the ladder i.e., with the wall and the floor is 0.2. 7 Marks

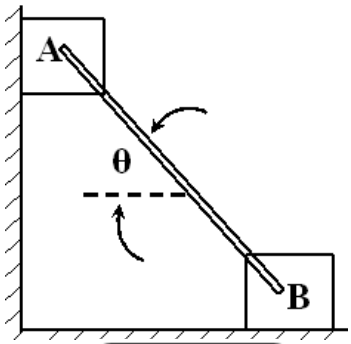
c) Explain angle of repose, relation between friction angle and angle of repose. 3 Marks

(OR)

6 a) Two rectangular blocks of weights W_1 and W_2 are connected by a flexible cord and rest up on a horizontal and an inclined plane, respectively, with the cord passing over a pulley as shown in Figure. In the particular case where $W_1=W_2$ and the coefficient of static friction μ is the same for all the contiguous surfaces, find the angle α of inclination of the inclined plane at which motion of the system will impend. Neglect friction in the pulley. 7 Marks



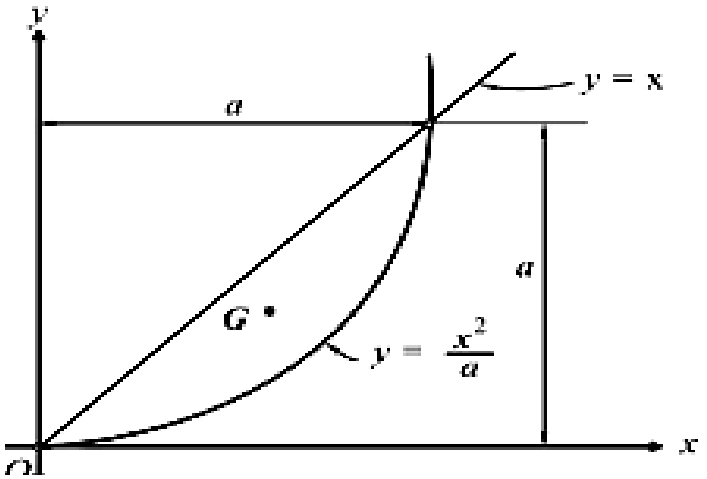
b) Two identical blocks A and B are connected by a rod and rest against vertical and horizontal planes, respectively, as shown in the figure. If sliding impends when $\theta=45°$, determine the coefficient of friction μ, assuming it to be same at both floor and wall. 7 Marks



UNIT-IV

7 a) The moment of inertia of a triangular section of base 'b' and height 'h' about an axis through its centre of gravity and parallel to the base is. 3 Marks

b) Determine the coordinates Xc and Yc of the centroid 'C' of the area between the parabola $y = x^2/a$ and the straight line $y = x$. 7 Marks



c) Find the Moment of Inertia of a rectangle having dimensions ***a*** and ***b*** with respect to a diagonal. 4 Marks

(OR)

8 a) What is the importance of radius of gyration? Explain with suitable sketch. 3 Marks

b) Find the Moment of Inertia of a square with sides of length "a" with respect to diagonal. 4 Marks

c) Find the Mass moment of inertia of a homogeneous triangular plate of mass ***m*** with respect to its base. 7 Marks

UNIT-V

9 a) i) What is the acceleration of a body of mass 'm' when it is sliding on a smooth plane and inclined at an angle θ to the horizontal?. 4 Marks

ii) Two bodies of masses 10 kg and 15 kg are hung from the ends of an extensible rope passing over a frictionless pulley. If masses of both the bodies are doubled, what about the acceleration of the system will be?

b) An elevator of gross weight W=4450N when stopping, moves with constant deceleration and from the constant velocity v = 1.8*m/s*, comes to rest in 2 *s*. Determine the force *P* transmitted during stopping to the floor of the elevator by the feet of a man weighing 765.5N. 3 Marks

c) A 667.5 N man sits in a 333.75N canoe and fire a rifle bullet horizontally directly over the bow of the canoe. Neglect friction of the water, find the velocity **v** with which the canoe will move after the shot if the rifle has a muzzle velocity of 660 m/s. 7 Marks

(OR)

10 a) i) The motion of a particle is given by x=t2+8t+4, y= t3+3t2+8t+4. Determine the initial velocity of the particle. 4 Marks

ii) If a stone falls past a window of 2.45 m height in half a second, find the height from which the stone fell.

b) A block of mass 5kg is thrust up a 30° inclined plane with an initial velocity of 4 m/sec. It travels a distance of 1.0m before it comes to rest. What is the force of friction acting on it? 3 Marks

c) To determine experimentally the coefficient of friction between two materials, a small block of weight W= 44.5N is projected with initial velocity V_o= 9m/s along a horizontal plane covered with the same material. If the block travels a total distance x= 13.5m before coming to rest, what is the coefficient of friction? 7 Marks

CODE No.: 16BT20241 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations June – 2022

BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

[Civil Engineering and Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

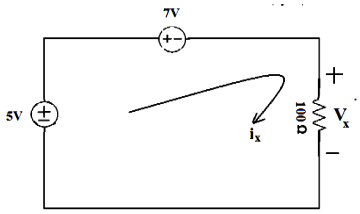
Answer One Question from each Unit

All questions carry equal marks

UNIT-I

1 a) Derive an expression for determining the equivalent inductance of two inductors L_1 and L_2 connected in series and parallel. 4 Marks

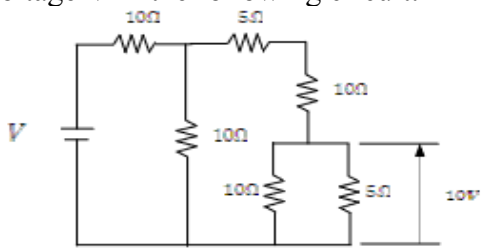
b) In the following circuit, find i_x 3 Marks



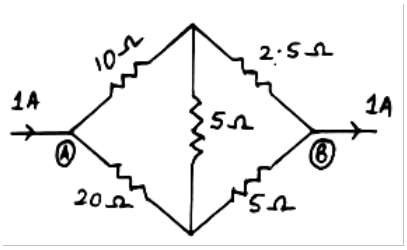
b) A 20V battery with an internal resistance of 5Ω is connected to a resistor of x ohms. If an additional 6Ω resistor is connected across the battery, find the value of x so that the external power supplied by the battery remains the same. 7 Marks

(OR)

2 a) Calculate the supply voltage V in the following circuit: 8 Marks



b) Find the equivalent resistance between A and B in the following circuit: 6 Marks



UNIT-II

3 When a coil connected to 200V, 50Hz supply takes a current of 10A and dissipates power 1200W. Find: 14 Marks

i) resistance ii) reactance

iii) real power iv) reactive power

v) apparent power and sketch the phasor diagram.

(OR)

4 A coil of 50Ω and 0.5H is connected across 200V, 50Hz supply. Find - 14 Marks

i) Inductive reactance ii) Circuit impedance
iii) Supply current iv) Power factor
v) Phase angle vi) Voltages across R and L and
vii) Active, reactive and overall (apparent) power.

Obtain expressions for voltage and current. Also sketch the complete phasor and vector diagrams.

UNIT-III

5 a) Explain the different types of DC generators and mention their applications. 7 Marks

b) A 4 pole, wave-wound DC generator has 50 slots and 24 conductors / slot. The flux/pole is 10mWb. Determine the induced **emf** in the armature if it is rotating at 600 rpm. 7 Marks

(OR)

6 a) A 4 pole, lap-wound DC generator has 100 slots and 12 conductors / slot. The flux/pole is 0.5Wb. Determine the induced **emf** in the armature if it is rotating at 1500 rpm. 7 Marks

b) Derive the torque equation of a DC motor. 7 Marks

UNIT-IV

7 Select suitable application for Hall effect transducer and describe the construction, principle of working. 14 Marks

(OR)

8 a) Explain the construction and working of a linear voltage differential transformer (LVDT). 7 Marks

b) How the magnitude and direction of the displacement of core of an LVDT is detected? Explain. 7 Marks

UNIT-V

9 a) Explain in detail about frequency response of CE amplifier. 7 Marks

b) Explain how transistor acts as an amplifier. 7 Marks

(OR)

10 Explain the principle and operation of full wave rectifier and also give the advantages and disadvantages of full wave rectifier. 14 Marks

❀ ❀ ❀

CODE No.: 16BT20401 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations June – 2022

ELECTRONIC DEVICES AND CIRCUITS

[Electrical and Electronics Engineering, Electronics and Communication Engineering and Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1	a)	Derive the expression for ripple factor of full wave rectifier with L-section Filter.	8 Marks
	b)	The voltage across a silicon diode at room temperature is 0.7 V when 2mA current flow through it. If the voltage increases to 0.75 V , calculate the diode current (assume V_T = 26mV).	6 Marks
		(OR)	
2	a)	A full wave rectifier has a centre-tap transformer of 100 – 0 – 100 volt and each one of the diodes is rated at Imax = 400mA and Iav = 150mA. Neglecting the voltage drop across the diodes, determine: i) the value of load resistor that gives the largest d.c. power output. ii) **d.c** load voltage and current.	7 Marks
	b)	Derive an expression for Diffusion capacitance.	7 Marks

UNIT-II

3	a)	Define stability factor. Derive an expression for the stability factor of a collector to base bias circuit.	7 Marks
	b)	What is thermal runaway? What is the condition for thermal stability? Explain.	7 Marks
		(OR)	
4	a)	Explain the basic construction, operation and common emitter characteristics of BJT and mention its applications.	7 Marks
	b)	In a silicon transistor circuit with a fixed bias, V_{CC} = 9V, R_C = 3KΩ, R_B= 8KΩ, β = 50, V_{BE} = 0.7V. Draw the **d.c** load line and determine operating point. What is stability Factor?	7 Marks

UNIT-III

5	a)	Explain the set-up for measurement of h-parameters.	4 Marks
	b)	Give the complete analysis of CC transistor amplifier circuit using h-parameters and derive expressions for the current gain, voltage gain, input impedance and output admittance.	10 Marks
		(OR)	
6	a)	The CC transistor amplifier circuit has the following specifications: *hic*= 1100Ω, *hrc* = 0.99, *hfc* = -51, *hoc* = 25 μA/V. If *RL* = 15 kΩ and *RS* = 1 kΩ, find various gains and input, output impedances	8 Marks
	b)	Compare AV, AI, Ri and Ro of CE, CB and CC configurations.	6 Marks

UNIT-IV

7	a)	Draw the small signal equivalent of FET amplifier in CD configuration and derive the equations for voltage gain, input, impedance and output impedance.	7 Marks
	b)	Compare and contrast BJT and FET.	7 Marks
		(OR)	

8	a)	Discuss the biasing methods for FETs.	6 Marks
	b)	Calculate the operating point of the self biased JFET having the supply voltage V_{DD} = 20 V, maximum value of drain current I_{DSS} = 10 mA and V_{GS} = - 3V at I_D = 4 mA. Also, determine the values of resistors R_D and R_S to obtain this bias condition.	8 Marks

UNIT-V

9		Explain the construction and working of Tunnel diode.	14 Marks

(OR)

10		Sketch and explain V-I characteristics of tunnel Diode. Indicate the negative resistance region.	14 Marks

❀ ❀ ❀

CODE No.: 16BT20441 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations June – 2022

BASIC ELECTRONIC DEVICES AND CIRCUITS
[Computer Science and Engineering, Information Technology and Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1	a)	Derive the expression for total diode current components.	8 Marks
	b)	The reverse saturation current of a silicon P-N Junction diode at operating temperature of 27 degree C is 50nA. Compute the dynamic forward and reverse resistances of the diode for the applied voltage of 0.8V and -0.4V respectively.	6 Marks
		(OR)	
2	a)	Explain the operation of silicon P -N Junction diode and obtain the forward bias and reverse bias Volt-Ampere characteristics.	7 Marks
	b)	Derive the expression for Transition Capacitance.	7 Marks

UNIT-II

3	a)	With the help of input and output characteristics, explain the operation of BJT in Common Emitter Configuration.	10 Marks
	b)	Explain the construction of BJT.	4 Marks
		(OR)	
4	a)	Explain the concept of biasing for amplification and principle of amplification with a BJT.	10 Marks
	b)	Write the relation between Alpha, Beta and Gamma.	4 Marks

UNIT-III

5	a)	Explain the features of JFET and draw the drain characteristics.	8 Marks
	b)	How does MOSFET differs from JFET?	6 Marks
		(OR)	
6		Explain the construction and working of a JFET and draw the graph for drain and transfer characteristics.	14 Marks

UNIT-IV

7	a)	What do you understand by feedback in amplifiers? Explain the terms feedback factor and open loop gain.	10 Marks
	b)	What are the disadvantages of negative feedback?	4 Marks
		(OR)	
8	a)	Explain with circuit diagram a negative feedback amplifier and obtain expression for its closed loop gain.	10 Marks
	b)	When will a negative feedback amplifier circuit is unstable?	4 Marks

UNIT-V

9		Explain the principle of operation and characteristics of Tunnel diode.	14 Marks
		(OR)	
10		Explain the construction and working operation of UJT with neat sketches.	14 Marks

❀ ❀ ❀

CODE No.: 16BT20541 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations June – 2022

FOUNDATIONS OF DATA STRUCTURES

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Illustrate bucket sort algorithm with an example.	14 Marks
		(OR)	
2		Illustrate radix sort algorithm and sort the following numbers using radix sort. 77, 12, 8, 39, 27, 21, 44, 18, 6, 427, 117, 237, 5671 and 600.	14 Marks

UNIT-II

3		Convert the following infix expression to postfix using stack. ((A-(B+C))*D)$(E+F)	14 Marks
		(OR)	
4		Evaluate the given postfix expression 623+-382/+*2$3+.	14 Marks

UNIT-III

5	a)	Write and Explain dynamic memory management functions in detail.	10 Marks
	b)	List the applications of linked list.	4 Marks
		(OR)	
6		Explain circular linked list operations in detail.	14 Marks

UNIT-IV

7	a)	Give an algorithm for finding minimum element in binary tree.	9 Marks
	b)	Define full binary tree and complete binary tree with suitable example.	5 Marks
		(OR)	
8		Explain the operations of binary search tree in detail.	14 Marks

UNIT-V

9		Solve: Given input (371, 323, 173, 199, 344, 679, 989) and hash function h(x)=x mod 10, Show the resulting. i) Separate Chaining. ii) Closed hashing using linear probing, quadratic probing, and double hashing $h_2(x) = 7 - (x \bmod 7)$.	14 Marks
		(OR)	
10		Compare the following Open addressing methods: i) Linear Probing; ii) Quadratic Probing; iii) Double Hashing.	14 Marks

❀ ❀ ❀

CODE No.: 16BT21501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations June – 2022

DIGITAL LOGIC DESIGN

[Computer Science and Engineering, Information Technology and Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Determine the value of base x if $(211)_x = (152)_8$.	7 Marks
	b)	Define a signed binary number. Compare 1's and 2's complement methods of representation of negative numbers.	7 Marks
		(OR)	
2	a)	Convert the given Gray code number to equivalent binary $(1001001011110010)_2$.	7 Marks
	b)	Convert $(\texttt{A0F9.0EB})_{16}$ to decimal, binary, octal number.	7 Marks

UNIT-II

3	a)	Explain two -level and multi-level realization.	7 Marks
	b)	Compute the canonical sum of products and product of sums of A'B+ABC+C'B'.	7 Marks
		(OR)	
4	a)	Design a circuit for the function F = Σ (2, 3, 5, 7, 10, 11, 12) using i) Minimum number of NAND gates and ii) Minimum number of NOR gates.	7 Marks
	b)	Simplify the Boolean expression f (A,B,C,D) = Σ m(0,1,3,4,8,9,15) + Q(2,6) using K- map method.	7 Marks

UNIT-III

5	a)	Draw and explain the operation of a multiplexer.	7 Marks
	b)	Design a priority encoder of 4-bit.	7 Marks
		(OR)	
6	a)	Explain the Magnitude comparator with logic diagrams.	7 Marks
	b)	Explain the Binary subtractors with Truth table.	7 Marks

UNIT-IV

7	a)	Compare the merits and demerits of ripple and synchronous counters.	7 Marks
	b)	Design a 4-bit ripple counter using T Flip-Flops.	7 Marks
		(OR)	
8	a)	Explain the circuit diagram of a S-R Flip-Flop using 2- input NOR gates.	7 Marks
	b)	Draw and explain 4-bit shift register with an example.	7 Marks

UNIT-V

9	a)	Draw and explain the block diagram of PAL.	7 Marks
	b)	Differentiate in detail about SRAM and DRAM.	7 Marks
		(OR)	
10		A combinational circuit is defined by the functions: F1 (A,B,C) = Σ(3,5,6,7) F2 (A,B,C) = Σ(0,2,4,7) Implement the circuit with a PLA having 3 - inputs, four product terms and two outputs.	14 Marks

❀ ❀ ❀

CODE No.: 16BT1BS01 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

ENGINEERING CHEMISTRY

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Can distilled water be equated to the one obtained from demineralization process in all its aspects? Explain your answer with all necessary chemical reactions involved.	7 Marks
	b)	DISCUSS deionization process of water softening with neat DIAGRAM. Give the chemical reactions where ever is necessary.	7 Marks

(OR)

2	a)	Central Water Commission (CWC) of Tirupati section reports on underground water sample (in mg/L) at the proposed site for the construction of thermal power plant (300 Mw) near Vijayawada is as follows: $Ca(HCO_3)_2$ = 220, $MgCl_2$ = 130, $CaSO_4$ = 98, $Mg(HCO_3)_2$ = 56, $MgSO_4$ = 84, DO = 8, NaCl = 4 and Na_2CO_3 = 22. Discuss in detail the operational troubles suffer by the boiler, if above sample of water is to be fed into 56.24×10^4 kg m^{-2} boiler.	8 Marks
	b)	Discuss the role of polymers in purification of water by using advanced methods.	6 Marks

UNIT-II

3	a)	Discuss the synthesis, properties and applications of poly carbonates.	7 Marks
	b)	Explain the mechanism of degradation and applications of Bio-degradable polymers.	7 Marks

(OR)

4	a)	What is self lubricating plastic? Give examples. Name some specific applications.	5 Marks
	b)	Discuss types of composites and their industrial applications.	9 Marks

UNIT-III

5	a)	What are the basic components of GREEN CHEMISTRY research? Discuss with the suitable examples.	7 Marks
	b)	Discuss the applications of Nanomaterials.	7 Marks

(OR)

6	a)	Explain wet chemical synthesis of Nanomaterials.	7 Marks
	b)	Discuss the applications of GREEN CHEMISTRY in science and technology.	7 Marks

UNIT-IV

7	a)	Describe the working principle, construction and chemistry of 1.5 V Zn – MnO_2 cell.	7 Marks
	b)	Explain why an electronic nose, in principle can measure (identify) a very large number of compounds (mixtures, smells etc) despite using a limited number of sensors.	7 Marks

(OR)

8	a)	Identify the type of battery commonly used in each of these consumer electronic products in olden days and today. Discuss their construction and Chemistry. Assume none uses solar cells. i) Digital Camera. ii) MP3 Player.	7 Marks
	b)	Discuss the role of chemical sensor in determination of PH of unknown solution.	7 Marks

UNIT-V

9	a)	Identify the factors involved in influencing corrosion in the given underground and marine structures and explain.	7 Marks
	b)	How will you assess the situation and select the lubricant? Also explain Mechanism of Lubrication.	7 Marks

(OR)

10	a)	A student, in replying to an examination question, writes: 'Corrosion of metal is due to electrical currents of electrochemical origin, Stop current stop corrosion'. Comment on the correctness or otherwise of this statement on the basis of your knowledge of electrochemistry.	10 Marks
	b)	Write the qualities of a good lubricant.	4 Marks

CODE No.: 16BT1BS02 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

ENGINEERING PHYSICS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1	a)	Describe an optical fiber communication system.	6 Marks
	b)	Determine the numerical aperture of a step index fibre when the core refractive index n_1 = 1.5 and the cladding refractive index n_2 = 1.48. Also find out the maximum angle for the entrance of light, if the fibre is placed in air.	4 Marks
	c)	Discuss any two applications of lasers in Medicine.	4 Marks
		(OR)	
2	a)	Explain the conditions required for achieving lasing action.	4 Marks
	b)	Discuss the construction and working of a four level laser system you know with the help of energy level diagram.	6 Marks
	c)	Summarize the advantages of optical fiber communication system over conventional system.	4 Marks

UNIT-II

3	a)	Explain variation of potential for an electron moving in a one-dimensional lattice.	6 Marks
	b)	Draw and explain band diagrams for conductors, insulators and semi-conductors.	6 Marks
	c)	Explain Fermi-energy level.	2 Marks
		(OR)	
4	a)	Write a short note on electron energy levels of an isolated atom and a solid material.	6 Marks
	b)	Explain the considerations that led de-Broglie to postulate matter waves.	8 Marks

UNIT-III

5	a)	Explain construction and working of the following with a sketch. i) LED. ii) Photo-Diode.	8 Marks
	b)	How a p-n junction formed? Explain p-n junction diode with the help of an energy band diagram.	6 Marks
		(OR)	
6	a)	What is an extrinsic semiconductor? How does impurities affect the electrical conductivity of a doped semiconductor? Write expression for conductivity of an n-type semiconductor.	10 Marks
	b)	Find the electrical conductivity of intrinsic silicon whose charge concentration is 1.5 x $10^{16}/m^3$ and the mobility of electron and hole are 0.13m^2/V-s and 0.05m^2/V-s respectively.	4 Marks

UNIT-IV

7	a)	Describe the requirements of an acoustically good hall.	6 Marks
	b)	Explain the parameters to judge the quality of acoustics of a room.	8 Marks
		(OR)	
8	a)	Write a short note on Absorption coefficient. Suggest a method for measuring absorption coefficient.	10 Marks
	b)	Suggest remedies to improve acoustics of buildings.	4 Marks

UNIT-V

9	a)	How is nano-world uniquely different?	6 Marks
	b)	Discuss the synthesis of nano materials by pulsed laser deposition method with appropriate figures. Discuss its advantages.	8 Marks

(OR)

10	a)	Discuss important concerns of material scientists in the Nano science.	6 Marks
	b)	Discuss the mechanical properties of nano materials. How can these be used in different applications?	8 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

TRANSFORMATION TECHNIQUES AND PARTIAL DIFFERENTIAL EQUATIONS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1 Draw the graph of the triangular periodic signal defined by 14 Marks

$f(t) = \begin{cases} \pi t, & 0 \le t \le 1 \\ \pi(2-t), & 1 \le t \le 2 \end{cases}$ and f (t+2) =f(t).

Express the signal as series of sin and cosine terms.

(OR)

2 Represent the modified saw toothed wave form 14 Marks

$f(x) = 0$ for $-\pi < x \le 0$

$= x$ for $0 < x \le \pi$ as a Fourier series and hence evaluate

$1 + \frac{1}{3^2} + \frac{1}{5^2} + \text{- - - - - - -}$.

UNIT-II

3 Find the Fourier sine transform of e^{-ax}/x. 14 Marks

(OR)

4 Using Fourier integral representation show that $\int_0^\infty \frac{\omega \sin x\omega}{1+\omega^2} d\omega = \frac{\pi}{2} e^{-x}$ for $x > 0$. 14 Marks

UNIT-III

5 a) Find the Laplace transform of the square wave function $E(t)$ of period $T = 2$ defined as $E(t) = \begin{cases} 1, 0 \le t < 1 \\ 0, 1 \le t < 2 \end{cases}$. 8 Marks

b) Determine $L[\sin^2 t]$. 6 Marks

(OR)

6 Determine the Laplace transform of $\frac{\sin^2 t}{t}$. Also, evaluate the integral 14 Marks

$\int_0^\infty e^{-t} \frac{\sin^2 t}{t} dt$.

UNIT-IV

7 a) Evaluate $Z(n \cos n\theta)$. 6 Marks

b) If $U(z) = \frac{2z^2 + 3z + 12}{(z-1)^4}$, then determine $\mathbf{u_3}$. 8 Marks

(OR)

8 Using Z-transform, solve $u_{n+2} + 4u_{n+1} + 3u_n = 3^n$ with $u_0 = 0, u_1 = 1$. 14 Marks

UNIT-V

9 Find the differential equation whose general solution is given by u(x,t) = f(x-ct) + g(x+ct), where **f** and **g** are arbitrary twice differentiable functions. 14 Marks

(OR)

10 Solve $\frac{\partial^2 z}{\partial x^2} + z = 0$, given that when x = 0, $z = e^y$ and $\frac{\partial z}{\partial x} = 1$. 14 Marks

CODE No.: 16BT20101 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

BUILDING MATERIALS AND CONSTRUCTION TECHNOLOGY
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1		Explain in detail about the manufacturing process of bricks.	14 Marks
		(OR)	
2	a)	Explain about the manufacturing methods of tile.	10 Marks
	b)	Write about the characteristics of a good tile.	4 Marks

UNIT-II

3		Explain about the physical tests of cement.	14 Marks
		(OR)	
4		Explain about the strength and chemical tests of cement.	14 Marks

UNIT-III

5	a)	Explain about the classification of rubber.	7 Marks
	b)	Explain about compounding and uses of rubber.	7 Marks
		(OR)	
6	a)	Explain about the constituents of plastics.	7 Marks
	b)	Write short notes about properties of plastic.	7 Marks

UNIT-IV

7	a)	Brief about different types of footings.	7 Marks
	b)	Distinguish between rubble and ashlar masonry.	7 Marks
		(OR)	
8		Discuss about different types of floors.	14 Marks

UNIT-V

9	a)	Describe in brief various types of shores.	7 Marks
	b)	Compare timber and steel scaffolding.	7 Marks
		(OR)	
10	a)	Explain about the methods of underpinning.	7 Marks
	b)	Explain about the component parts of scaffolding.	7 Marks

❀ ❀ ❀

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

ENGINEERING MECHANICS

[Civil Engineering, Mechanical Engineering]

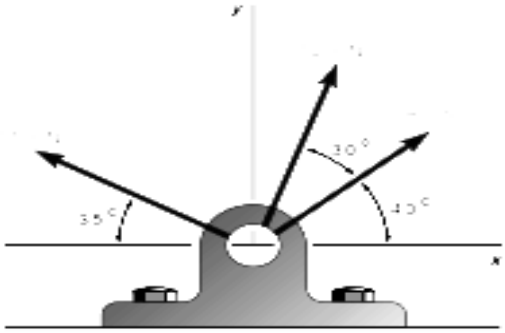
Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

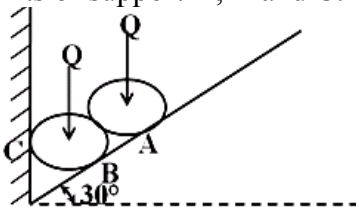
UNIT-I

1 a) Explain free body diagram with examples. 3 Marks

b) Determine the x and y components of each of the forces shown and also find the resultant of all these forces. 4 Marks



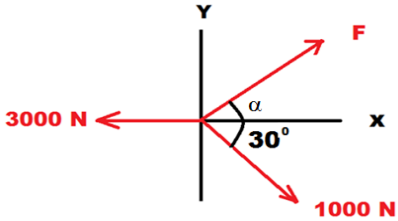
c) Two identical rollers each of weight Q = 445N are supported by an inclined plane and a vertical wall as shown in figure. Assuming smooth surfaces, find the reactions induced at the points of support A, B and C. 7 Marks



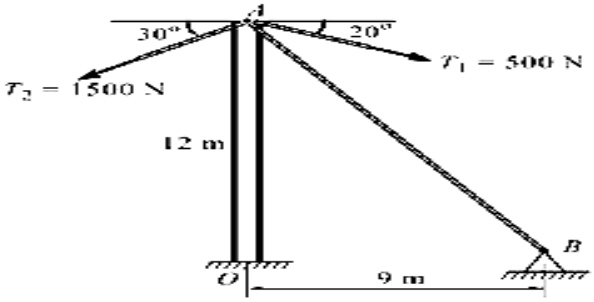
(OR)

2 a) Distinguish among the equilibrium, resultant and equilibrant. 3 Marks

b) The force system shown in fig. below has a resultant of 900 N pointing up along positive Y axis. Find the value of F and α required to give this resultant. 4 Marks



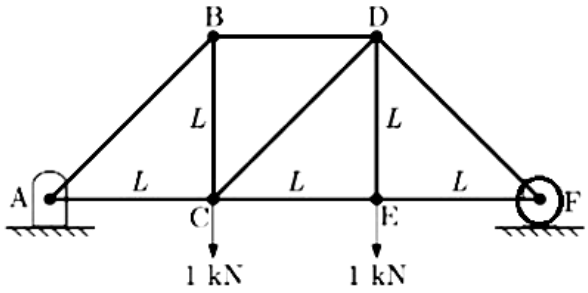
c) The top end of vertical boot is connected by two cables having tension T_1=500N and T_2=1500N as shown in figure. The third cable AB is used as a guy wire. Determine the tension in cable AB if resultant of the three concurrent forces acting at A is vertical. Also find the resultant. 7 Marks



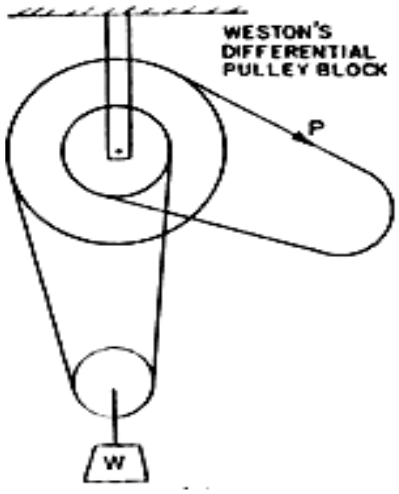
UNIT-II

3 a) Distinguish between moments and couple with suitable applications. 3 Marks

b) For the loading on truss as shown in the figure, find the force in member CD. 4 Marks



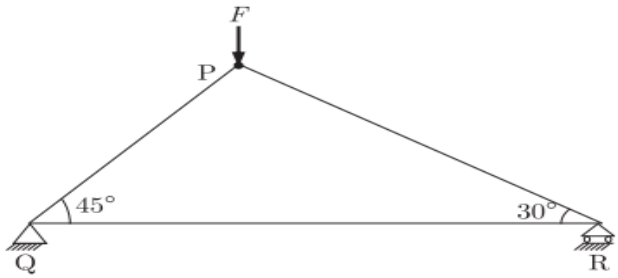
c) The diameters of the two steps of the pulley of a Weston's differential pulley block are 40cm and 30cm respectively. Determine the value of the effort required to lift a load of 4KN using the principle of virtual work. Neglect the frictional forces. 7 Marks



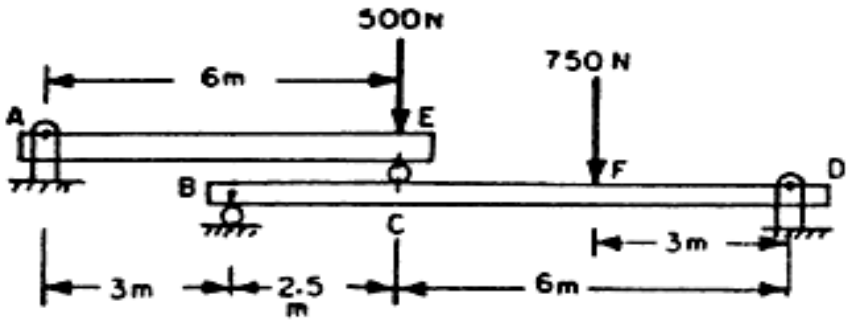
(OR)

4 a) Explain concept of virtual work with suitable example. 3 Marks

b) Consider a truss PQR loaded at P with a force F as shown in the figure. Find the tension in the member QR. 4 Marks

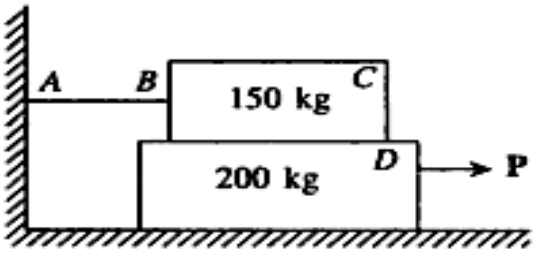


c) Determine the reactions at rollers B and C of the beam shown in figure using the method of virtual work. 7 Marks

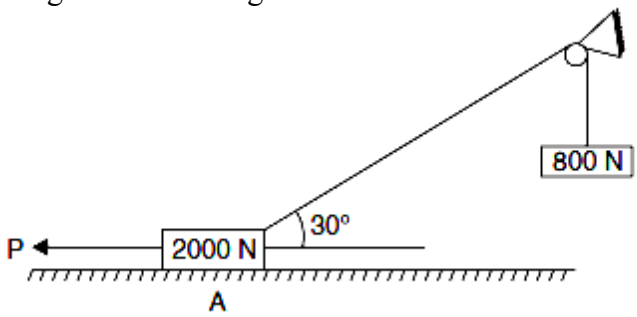


UNIT-III

5 a) If the coefficient of friction are known to be μ_s= 0.30 and μ_k= 0.25 between all surfaces of contact in figure, find the smallest force P required to start block D moving when (i) block C is restrained by cable AB as shown, and (ii) cable AB is removed. If P = 1500N, determine the resultant of the friction forces exerted on block D if block C is restrained as shown. 8 Marks

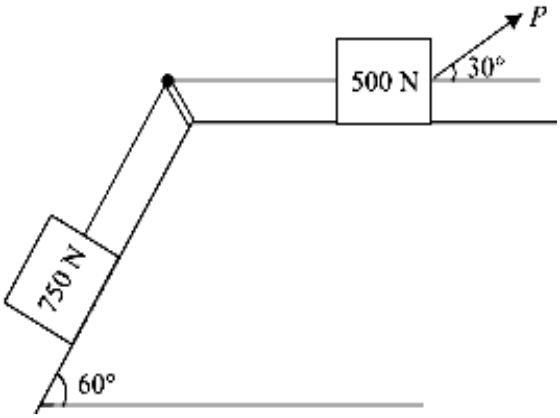


b) The block A shown in figure weighs 2000N. The cord attached to if passes over a frictionless pulley and supports a weight equal to 800N. The value of coefficient friction between A and the horizontal plane is 0.35. Determine the horizontal force P: (i) If the motion is impending towards the left. (ii) if the motion is impending towards the right. 6 Marks

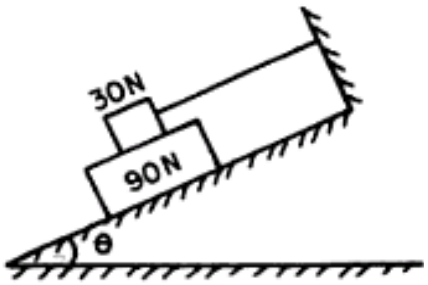


(OR)

6 a) What is the least value of P in the system shown in figure to cause the motion to impend? Assume the pulley is smooth and coefficient of friction between the other contact surfaces is 0.2. 7 Marks



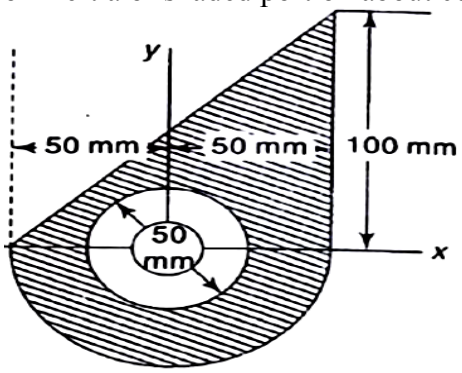
b) What should be the value of the angle θ in figure so that the motion of the 90 N block impends down the plane? The coefficient of friction μ for all the surfaces is 1/3. 7 Marks



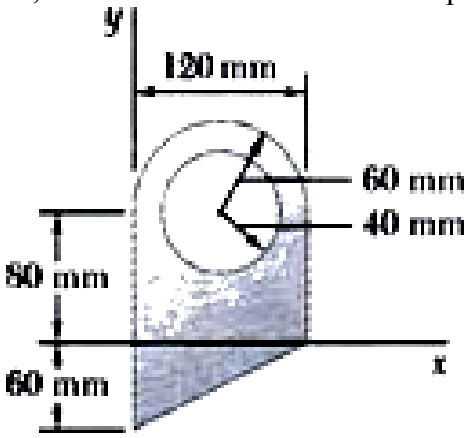
UNIT-IV

7 a) What are the centroidal coordinates of a quarter circular area placed in second quadrant of coordinate system? 3 Marks

b) Calculate the Moment of Inertia of shaded portion about centroidal x-axis. 7 Marks



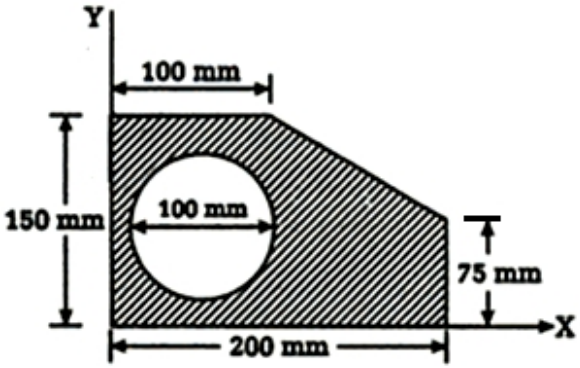
c) For the plane area shown, determine the centroid with respect to the x-axis. 4 Marks



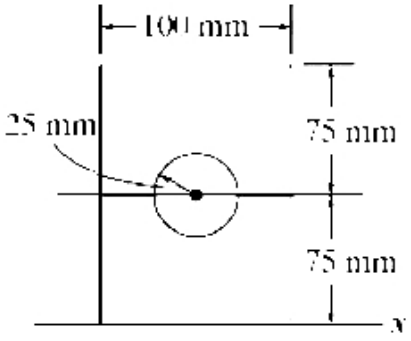
(OR)

8 a) Explain the concept of mass moment of inertia. What is the relation between area moment of inertia and mass moment of inertia? 3 Marks

b) Referring to the figure, determine the coordinates x_c and y_c of the center of a 100mm diameter, circular hole cut in a thin plate so that this point will be the centroid of the remaining shaded area. 7 Marks



c) Compute the moment of inertia of the composite area about the x-axis. 4 Marks



UNIT-V

9 a) i) State law of conservation of momentum. 4 Marks

ii) A pulley 2 m in diameter is keyed to a shaft which makes 240 r.p.m. Find the angular and linear velocities of a particle, on the periphery of the pulley.

b) A 10 gm bullet is shot horizontally in a wood block of mass 1 kg. The bullet gets embedded in the block and the block is displaced on a rough horizontal table (μ=0.2) through 1 m. What was the velocity of bullet? 3 Marks

c) A man of mass 75 kg and a boy of mass 25kg drive off the end of a boat of the mass 20kg so that their relative horizontal velocity with respect to the boat is 3m/s. If initially the boat is at rest find its final velocity if (i) the two dive off simultaneously (ii) the man dives first followed by the boy. 7 Marks

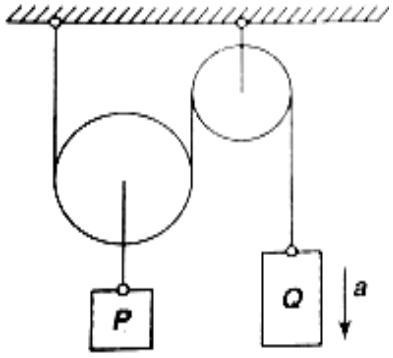
(OR)

10 a) **(i)** An elevator is required to lift a body of mass 65 kg. Find the acceleration of the elevator, which could cause a pressure of 800 N on the floor. 4 Marks

(ii) Anelevatorweighing100 kN attains an upward velocity of 4m/s in two seconds with uniform acceleration. What would be the tension in the cable?

b) The wheel of a small gyroscope is set spinning by pulling on a string wound around the shaft. Its moment of inertia is I=5562.5 kg-mm^2 and the diameter of the shaft on which the string is wound is 12.5mm. If 750mm of string is pulled off with a constant force of 53.4N, what angular velocity will be imparted to the wheel? 3 Marks

c) Two weights P and Q are connected by the arrangement shown in figure neglecting friction and the inertia of the pulleys and cord, find the acceleration ***a*** of the weight Q. Assume that P = 178N and Q = 133.5N. 7 Marks



SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

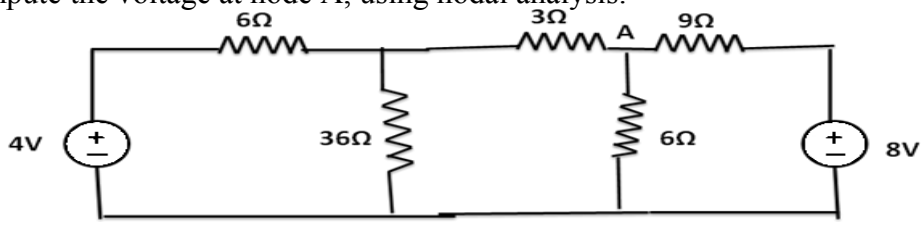
[Civil Engineering, Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

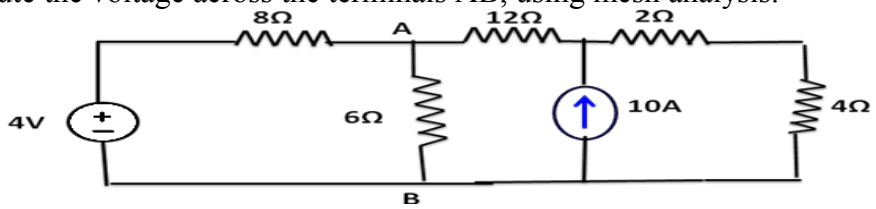
Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1 a) Compute the voltage at node A, using nodal analysis. 7 Marks

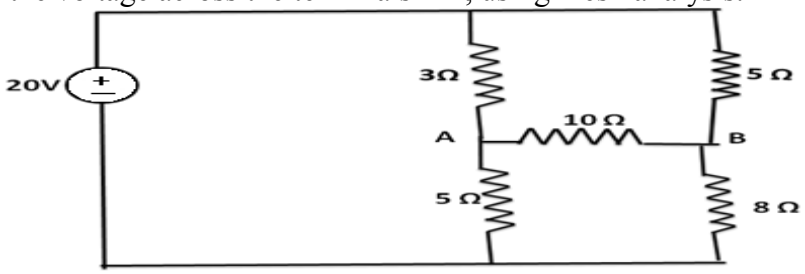


b) Compute the voltage across the terminals AB, using mesh analysis. 7 Marks

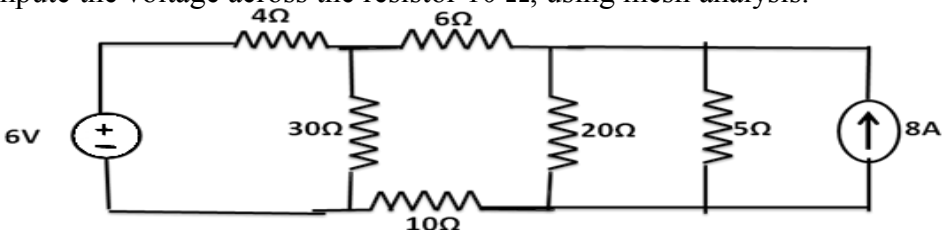


(OR)

2 a) Compute the voltage across the terminals AB, using mesh analysis. 7 Marks

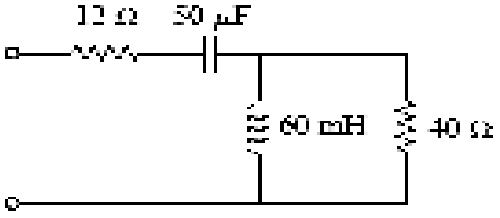


b) Compute the voltage across the resistor 10 Ω, using mesh analysis. 7 Marks

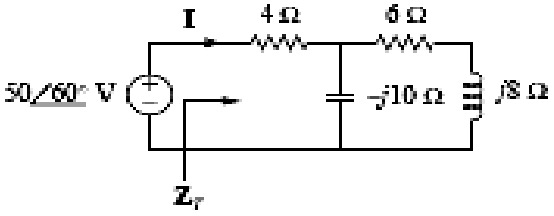


UNIT-II

3 a) Find the input impedance of the circuit, assume ω = 377 rad/sec. 7 Marks

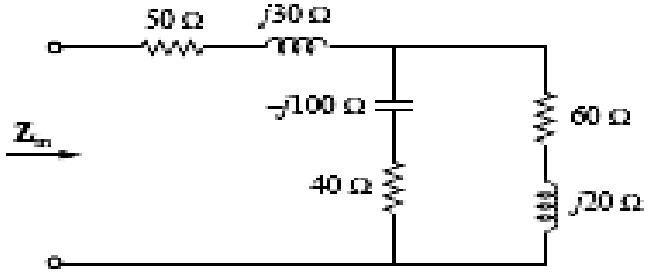


b) Find Z_f and I in the circuit shown below. 7 Marks

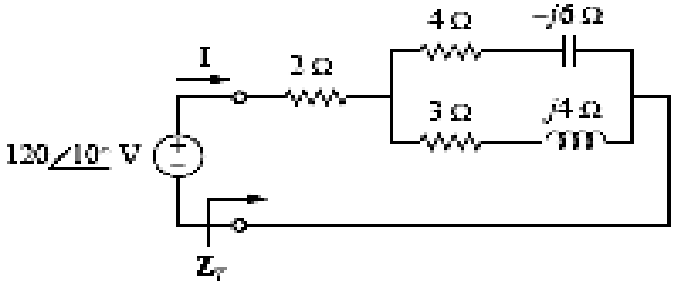


(OR)

4 a) Compute the Z_{in}, circuit shown below. 7 Marks



b) Determine the Z_f and I circuit shown below. 7 Marks



UNIT-III

5 a) State the applications of three phase induction motors. Also state the salient features of three phase induction motors. 7 Marks

b) A single-phase 800V/100V, 50Hz transformer has a maximum core flux density of 1.294 T and an effective cross-sectional area of $60\,cm^2$. Calculate the number of turns on the primary and secondary windings. 7 Marks

(OR)

6 a) Make use of Faraday's law derive the equation for the EMF induced in a DC machine. 5 Marks

b) State the applications of DC compound motors. 3 Marks

c) A 4–pole, 440V shunt motor takes 8A on no load, the no load speed being 750 R.P.M it has shunt field current of 1.5 A. Calculate the full load speed of the motor if it takes 100A at full load. Armature resistance is 0.25Ω. Neglect armature reaction. 6 Marks

UNIT-IV

7 a) Explain the operation of ammeter using block diagram. 7 Marks

b) State the instrument measures the thickness of conductor; explain the procedure to measure the same. 7 Marks

(OR)

8 a) State the difference between stain gauge and load cell. 7 Marks

b) State and explain the method of current measurement by passive method. 7 Marks

UNIT-V

9 a) How the transistor act as an amplifier? Explain. 7 Marks

b) Derive the current gain of common emitter configuration transistor amplifier using voltage divider biasing. 7 Marks

(OR)

10 a) State the difference between diode and transistor, as both are semiconducting switches. 7 Marks

b) State the need for amplifier in electronic circuits. Explain how a NPN Transistor act as amplifier. 7 Marks

❀ ❀ ❀

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

ELECTRONIC DEVICES AND CIRCUITS

[Electrical and Electronics Engineering, Electronics and Communication Engineering and Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1 a) Compare the performance of inductor, L-section and $\tilde{\pi}$section filters. 7 Marks

b) In a full wave rectifier with capacitor filter, find out ripple factor, I_{dc} and load resistance if $C = 600\mu F$, $T = 20$ ms, $V_r = 1.2$V and $V_{dc} = 9V$. 7 Marks

(OR)

2 a) Explain the diode characteristics from diode equation. 7 Marks

b) Explain the effect of temperature on diode characteristics. 7 Marks

UNIT-II

3 a) Define stability factor and derive it for a transistor from general current equation. 7 Marks

b) What is thermal runaway? How to avoid it? 7 Marks

(OR)

4 a) Determine the quiescent current and collector to emitter voltage for a silicon transistor with β=50 in self biasing arrangement with the following component values V_{CC} = 20V, R_C = 2KΩ, R_E = 100Ω, R_1 = 100KΩ, R_2 = 5KΩ. Also find the stability factor. 8 Marks

b) Derive the expression for S' in self-bias arrangement. 6 Marks

UNIT-III

5 a) A CE amplifier is driven by a voltage source of internal resistance R_s=800Ω and the load impedance R_L = 1000Ω. The h-parameters are h_{ie}=1$k\Omega$, h_{re} 2 x 10^{-4},, h_{fe}=50 and h_{oe} = 25μA/V. Compute the current gain A_I, input resistance R_i, voltage gain A_V and output resistance R_o using exact analysis. 9 Marks

b) Determine the h-parameters for common emitter configuration from the characteristic curves. 5 Marks

(OR)

6 a) Give the approximate h-parameter conversion formulae for CC and CB configuration in terms of CE. 8 Marks

b) Explain how h-parameters are determined from transistor characteristics. 6 Marks

UNIT-IV

7 a) Draw the small signal equivalent of FET amplifier in CD configuration and derive the equations for voltage gain, input, impedance and output impedance. 8 Marks

b) Define g_m, r_d and μ and derive the relationship among them. 6 Marks

(OR)

8 a) Explain the construction features of an enhancement MOSFET with neat sketches. Also draw the drain characteristics. 8 Marks

b) In the common gate FET amplifier, R_D = 4 k Ω, R_S = 2 k Ω, $g_m = 2 \times 10^{-3}\ \Omega$, r_d = 40 k Ω. Calculate voltage gain, input impedance and output impedance. 6 Marks

UNIT-V

9 What is a varactor diode? Briefly explain the working of it with the help of V-I characteristics and circuit symbol equivalent. 14 Marks

(OR)

10 Draw the equivalent circuit and V-I characteristics of UJT and explain it. 14 Marks

❀ ❀ ❀

CODE No.: 16BT20441 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

BASIC ELECTRONIC DEVICES AND CIRCUITS
[Computer Science and Engineering, Information Technology and Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1	a)	List out the merits and demerits of bridge type full wave rectifier over centre tapped type full wave rectifiers.	5 Marks
	b)	The secondary voltages of centre tapped transformer are given as 60V-0V-60V. The total resistance of secondary coil and forward diode resistance of each section of transformer secondary is 62 Ω. Compute the following for a load resistance for 1K Ω i) Average load current. ii) Percentage load regulation. iii) Rectifier efficiency.	5 Marks
	c)	What is Bleeder resistance in L Section Filter?	4 Marks
		(OR)	
2		Explain the operation of Tunnel Diode with neat sketches.	14 Marks

UNIT-II

3	a)	Taking the example of CE amplifier, explain the criterion for selection of a suitable operating point and factors affecting its stability hence define stability factor.	10 Marks
	b)	In a transistor determine the alpha if collector current is 4.9mA and emitter current is 5mA.	4 Marks
		(OR)	
4	a)	Explain the methods of stabilising Q point of atransistor.	10 Marks
	b)	A transistor has alpha=0.98. If emitter current of the transistor is 1mA. Determine the base current and gain factor beta.	4 Marks

UNIT-III

5	a)	Explain how the transfer characteristics of an Enhancement MOSFET differ from that of Depletion MOSFET.	10 Marks
	b)	Define rd ad Gm.	4 Marks
		(OR)	
6	a)	Draw the drain characteristics of depletion mode MOSFET. Explain different operating regions.	10 Marks
	b)	How does MOSFET differs from JFET?	4 Marks

UNIT-IV

7	a)	State and briefly explain Barkhausen criterion for oscillation.	8 Marks
	b)	Explain the main difference between an amplifier and an oscillator.	6 Marks
		(OR)	
8	a)	Draw the circuit of Hartley oscillator and explain its working. Derive the expression for frequency of oscillation and condition for starting of oscillation.	10 Marks
	b)	Determine the frequency of a Hartley oscillator if L_1=100 uH and L_2=1 mH, M=20 uH and C=20 pF.	4 Marks

UNIT-V

9 Explain the terms: 14 Marks

i) Peak point voltage.
ii) Valley point voltage of a UJT.
iii) Mention some of the application of UJT.

(OR)

10 a) Explain the two transistor analogy of an SCR. 10 Marks

b) Once the SCR is triggred, the gate looses its control. Explain. 4 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

FOUNDATIONS OF DATA STRUCTURES

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1 a) Sort the sequence 80, 10, 40, 10, 50, 90, 20, 60, 50 by using 7 Marks
i) Merge sort.
ii) Quicksort, with the middle element as pivot and no cutoff (show all steps) Quicksort, with median-of-three pivot selection and a cutoff of 3.

b) Insertion Sort procedure uses a linear search to scan (backward) through the sorted subarray A [0 ... p - 1]. We can use a binary search instead to improve the overall worst-case running time of insertion sort to Θ(n log n). Write routines to implement it. 7 Marks

(OR)

2 a) Write about Radix sort and sort the following numbers using radix sort. 7 Marks
77, 12, 8, 39, 27, 21, 44, 18, 6, 427, 117, 237, 5671 and 600

b) Some of the sorting methods are not suited for use with linked lists. Which ones, and why not? Write linked list version of any sorting algorithm. 7 Marks

UNIT-II

3 a) Write down the algorithms to perform the operations on a stack and explain them. 7 Marks

b) How are priority queues implemented using a single queue. 7 Marks

(OR)

4 a) Construct the prefix and postfix form of the following given expression. 7 Marks
i) (A-B*C-D)/(E+F). ii) ((A+B)*C-(D-E)^(F+G)).
iii) A+B*(C-D)/(P-R).

b) Write an application program to maintain a list of items as a circular queue which is implemented using an array. Simulate insertion and deletion to the queue and display a graphical representation of queue after every operation 7 Marks

UNIT-III

5 a) What are the advantages of linked implementation of stack over array implementation? 7 Marks

b) Outline an algorithm to merge two ordered singly linked lists of integers into one ordered list. 7 Marks

(OR)

6 a) Write the peek()routine to implement stack ADT using Arrays. How does a stack implemented using a linked list differs from a stack implemented using an array? 7 Marks

b) Write the routines to implement linear queue using Linked lists which reads an integer and prints its digits in reverse order. 7 Marks

UNIT-IV

7 a) Create B-tree of order 4 (t = 2) created by inserting the following data arriving in sequence <92, 24, 6, 7, 11, 8, 22, 4, 5, 16, 19, 20, 78>. 7 Marks

b) Write a C function to insert an element into an AVL tree with single and double rotations. 7 Marks

(OR)

8 Write the insert ( ), delete ( ) and find ( ) routines for a binary search tree. What are the running times of your routines? Write an algorithm that counts the number of nodes in a binary tree. 14 Marks

UNIT-V

9 a) In a Graph, define path, closed path and simple path with an example 7 Marks

b) Draw the complete undirected graphs on one, two, three, four and five vertices. Prove that the number of edges in a n vertex complete graph is $n(n - 1)/2$. 7 Marks

(OR)

10 Show the result of inserting keys {89, 18, 49, 58, 69} into a open addressing table using the hash function h (k) = k mod 10 with the following collision resolution strategies. Outline the algorithm for inserting and deleting a key into a open addressing table. 14 Marks

i) $f_{(i)} = i$. ii) $f_{(i)} = i^2$. iii) $f_{(i)} = i*h_2(x)$.

Let the table have 10 slots and $h_2(x) = 7 - (x \bmod 7)$.

CODE No.: 16BT21201 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

OBJECT ORIENTED PROGRAMMING THROUGH C++

[Computer Science and Engineering, Information Technology and Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1	a)	Compare and contrast C and C++ through 3 similarities and 3 dissimilarities citing the example.	7 Marks
	b)	What is inheritance? Are the private variables of parent class can be inherited into a child class? Explain with an example.	7 Marks

(OR)

2	a)	What is name space and what location in the C++ program are they defined?	7 Marks
	b)	In what way structures in C are different from structures in C++? Develop a structure in C++ that encapsulate attributes of an entity which is a "purchase order"	7 Marks

UNIT-II

3	a)	What is recursion? Write an application program to find factorial using recursion.	7 Marks
	b)	Explain about storage class in C++.	7 Marks

(OR)

4	a)	What is the difference between Void, Boolean and I/O functions?	7 Marks
	b)	Differentiate between data types and derived data types.	7 Marks

UNIT-III

5	a)	With an example, explain nested selection statements.	7 Marks
	b)	Write a program to copy string to other without using in-built function.	7 Marks

(OR)

6	a)	Differentiate between passing by reference and passing by constant reference.	7 Marks
	b)	Write a program to swap two numbers using pointers.	7 Marks

UNIT-IV

7	a)	"Template functions are implicitly overloaded". Justify.	7 Marks
	b)	How will you be able to take control when a system based exception occurs and avoid terminating your program when such exception takes place?	7 Marks

(OR)

8	a)	Explain the difference that exists in passing objects, pointers to the objects and references to the objects as function arguments.	7 Marks
	b)	What are the limitations of overloading an [ ] operator? Justify the uses of [ ] operator overloaded function.	7 Marks

UNIT-V

9	a)	What are polymorphic classes? Explain how polymorphism is implemented using such classes.	7 Marks
	b)	Explain the way dynamic polymorphism is implemented with the help of an example program (A pointer to a parent object can hold the object of either the parent or the child).	7 Marks

(OR)

10	a)	In what way member functions are different from manipulator functions which are meant for undertaking the formatted I/O? Show the difference through an example.	7 Marks
	b)	Explain the way ambiguities resolve in the Hydride Inherence.	7 Marks

❀ ❀ ❀

CODE No.: 16BT21501 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

DIGITAL LOGIC DESIGN

[Computer Science and Engineering, Information Technology and Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1 a) Convert the following expressions into sum of products and product of sums: 8 Marks
i) $(AB + C)\,(B + C'D)\,(AB + C)(B + C'D)$
ii) $x' + x(x + y')(y + z')$

b) Verify that the following operations are commutative but not associative. 6 Marks
i) NAND. ii) NOR.

(OR)

2 Given the following Boolean function:
$F = xy'z + x'y'z + w'xy + wx'y + wxy$

a) Obtain the truth table of the function and draw the logic diagram using the original Boolean expression. 6 Marks

b) Simplify the function to minimum number of literals using principles of Boolean algebra. 4 Marks

c) Draw the logic diagram from the simplified expression and compare the total number of gates with the diagram of part (a) 4 Marks

UNIT-II

3 Simplify the following Boolean functions using K-maps:

a) $F(A, B, C, D) = \Sigma(2,3,10,11,12,13,14,15)$ 7 Marks

b) $F(A, B, C, D) = \Pi(0,1,2,3,4,6,12)$ 7 Marks

(OR)

4 Simplify the following Boolean functions using four-variable maps:

a) $F = \Sigma(0,1,2,4,5,7,11,15)$ 7 Marks

b) $F = \Sigma(0,2,4,5,6,7,8,10,13,15)$ 7 Marks

UNIT-III

5 What is the importance of a carry look ahead adder? Explain its operation for 4 bit addition with neat diagrams. 14 Marks

(OR)

6 a) Implement a full adder function using 4 x 1 multiplexers. 7 Marks

b) Illustrate the operation of 8 to 3 line encoder. 7 Marks

UNIT-IV

7 a) The content of a 4-bit register is initially 1101. The register is shifted six times to the right with the serial input being 101101. What is the content of the register after each shift? 4 Marks

b) Design a synchronous BCD counter with T flip-flops. 10 Marks

(OR)

8 a) Draw the circuit of 3 bit Johnson counter. Explain its operation by plotting the output waveforms. 7 Marks

b) Design a counter with the repeated binary sequence: 0, 1, 3, 7, 6, 4. Use T flip-flops and if the counter enters any invalid state, the next state must be 0. 7 Marks

UNIT-V

9 a) Compare PROM, EPROM, EEPROM. 6 Marks

b) Design a combinational circuit using a ROM. The circuit accepts a 3 bit number and generates an output binary number equal to the square of the input number. 8 Marks

(OR)

10 A combinational circuit is defined by the functions 14 Marks

$F_1(A, B, C) = \Sigma m(3, 5, 6, 7)$; $F_2(A, B, C) = \Sigma m(0, 2, 4, 7)$

Implement the circuit with a PLA having three inputs, four product terms and two outputs.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations August - 2021

BIOLOGY FOR ENGINEERS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	How living organisms are classified? List out the different kingdoms by various scientists.	6 Marks	L1	CO1	PO1
	b)	Summarize cellular basis of life.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Define living organisms and how they are classified based on the carbon and energy resources.	6 Marks	L1	CO1	PO1
	b)	Compare the differences of Plant cell and Bacterial cell.	6 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	Demonstrate the structure and functions of proteins.	4 Marks	L2	CO1	PO1
	b)	What is fermentation? Explain its process and industrial applications.	8 Marks	L2	CO2	PO3
		(OR)				
4.	a)	Explain the factors affecting enzyme reaction and its industrial applications.	7 Marks	L2	CO2	PO3
	b)	Show the structure and functions of DNA.	5 Marks	L2	CO2	PO1
		UNIT-III				
5.	a)	Summarize Mendel's single gene disorders.	6 Marks	L2	CO2	PO1
	b)	What is Genetic code? Explain translation process with a neat diagram.	6 Marks	L1	CO2	PO1
		(OR)				
6.		Name the enzymes involved in Replication, Transcription and Translation and describe their mechanism with neat labeled diagram.	12 Marks	L1	CO2	PO1
		UNIT-IV				
7.	a)	Recall the concepts of recombinant DNA technology and explain the applications of cloning.	6 Marks	L1	CO3	PO1
	b)	How to generate transgenic microbes and plants? Give examples for both the transgenic organisms.	6 Marks	L1	CO3	PO6
		(OR)				
8.	a)	List the advantages and disadvantages of recombinant vaccines.	6 Marks	L1	CO3	PO6
	b)	Outline the role of biosensors and biochips.	6 Marks	L2	CO3	PO6
		UNIT-V				
9.	a)	Interpret the role of Neurons in the Neurotransmission.	6 Marks	L5	CO1	PO2
	b)	Define DNA Microarray and detail its applications.	6 Marks	L1	CO3	PO1
		(OR)				
10.		Label the human digestive system features with neat diagram and write their functions.	12 Marks	L1	CO1	PO1

CODE No.: 19BT1BS03 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations August – 2021

ENGINEERING PHYSICS

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	How Newton's rings are formed? Derive an expression for the wavelength of source using Newton's ring experiment.	8 Marks	L3	CO1	PO2
	b)	In a Newton's rings experiment the diameter of the 15th ring was found to be 0.59cm and the 5th ring was 0.36cm. The radius of the plano-convex lens is 100cm, then calculate the wavelength of light.	4 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Summarize the theory of Quarter wave plate and Half wave plate.	6 Marks	L2	CO1	PO1
	b)	Describe the construction and working of a Nicol's Prism.	6 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Explain the physical significance of Maxwell's equations.	4 Marks	L2	CO2	PO1
	b)	Derive the free space electromagnetic wave equations and show that the velocity of the electromagnetic wave is $\frac{1}{\sqrt{\mu_0 \varepsilon_0}}$.	8 Marks	L3	CO2	PO2
		(OR)				
4.	a)	Define acceptance angle. Derive an expression for acceptance angle and numerical aperture of an optical fiber.	8 Marks	L3	CO2	PO1 PO2
	b)	List the applications of optical fibers in various fields of engineering.	4 Marks	L1	CO2	PO1

UNIT-III

5.	a)	Explain the concepts of drift and diffusion in semiconductors.	6 Marks	L2	CO3	PO1
	b)	Derive an expression for drift and diffusion currents in semiconductors.	6 Marks	L3	CO3	PO2
		(OR)				
6.	a)	Explain construction and working mechanism of a semiconductor diode laser.	8 Marks	L2	CO3	PO1
	b)	Predict the color of light emitted by a laser source made up of GaAs with band gap of 1.44 eV.	4 Marks	L3	CO3	PO2

UNIT-IV

7.	a)	What is Piezoelectricity? Explain.	6 Marks	L2	CO4	PO1
	b)	Outline electronic, ionic and orientation polarizations.	6 Marks	L2	CO4	PO1
		(OR)				
8.	a)	State magnetic moment. Explain the origin of magnetic moment in an atom.	6 Marks	L2	CO4	PO2
	b)	Differentiate the hard and soft magnetic materials based on hysteresis.	6 Marks	L2	CO4	PO1

UNIT-V

9.	a)	Explain Meissner's effect. How is it used to classify Type-I and Type-II superconductors?	8 Marks	L2	CO5	PO1
	b)	List any four applications of superconductors.	4 Marks	L1	CO5	PO1
		(OR)				
10.	a)	Discuss the various properties of nanomaterials.	6 Marks	L2	CO5	PO1
	b)	Describe the pulsed laser deposition technique to synthesize nanomaterials.	6 Marks	L2	CO5	PO1

CODE No.: 19BT1BS04 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations August - 2021

ENGINEERING CHEMISTRY

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What is Schrodinger wave equation and derive the expression for Schrodinger wave equation.	8 Marks	L3	CO1	PO1
	b)	Draw and explain the π molecular orbital representations of Butadiene.	4 Marks	L2	CO1	PO1
		(OR)				
2.	a)	N_2 molecule is more stable than O_2 molecule. How can you utilize the molecular orbital theory in supporting this statement?	8 Marks	L1	CO1	PO1
	b)	Identify the shape of SO_2, PCl_5, NH_3, SF_4 molecules using VSEPR theory.	4 Marks	L3	CO1	PO2

UNIT-II

3.	a)	A ground water sample has the following composition: $Ca(HCO_3)_2 = 16.2\ ppm$, $Mg(HCO_3)_2 = 14.6\ ppm$, $MgCl = 9.5\ ppm$, $MgSo_4 = 12.0\ ppm$, $CaSo_4 = 13.6\ ppm$. Calculate carbonate and non-carbonate hardness of water.	6 Marks	L3	CO2	PO2
	b)	What is meant by sterilization of water? Explain how sterilization of water is carried out by using chlorination.	6 Marks	L1	CO2	PO6
		(OR)				
4.		Describe the ion exchange process with a neat diagram. Ion exchange process is more advantageous than zeolite. Why?	12 Marks	L2	CO2	PO1

UNIT-III

5.	a)	Discuss the construction and working of $H_2.O_2$ fuel cell and identify its advantages and limitations.	8 Marks	L2	CO3	PO1
	b)	How can you protect the underground water pipes from corrosion?	4 Marks	L1	CO3	PO2
		(OR)				
6.	a)	Explain Differential aeration corrosion with examples.	8 Marks	L2	CO3	PO1
	b)	Calculate the standard electrode potential of zinc electrode dipped in 0.25M of $ZnSO_4$ at 25ºC ($E^o\ Zn/Zn^{2+} = 0.763V$).	4 Marks	L3	CO3	PO2

UNIT-IV

7.	a)	State Beer – Lamberts law and discuss various types of electronic transitions.	6 Marks	L2	CO4	PO1
	b)	Write the applications of IR spectroscopy.	6 Marks	L1	CO4	PO1
		(OR)				
8.	a)	Write the principle and applications of Scanning Electron Microscope.	6 Marks	L1	CO4	PO1
	b)	Define the terms auxochrome, chromophore and explain their significance.	6 Marks	L2	CO4	PO1

UNIT-V

9.	Define lubricant. Explain the properties of the lubricant and their significance.	12 Marks	L2	CO5	PO1
	(OR)				
10.	Describe the Bergius method with a neat diagram and write the advantages, disadvantages of synthetic petrol.	12 Marks	L2	CO5	PO1

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations August - 2021

TRANSFORMATION TECHNIQUES AND LINEAR ALGEBRA

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Find the Fourier series of the function $f(x) = x + x^2$ *in* $(0,3)$.	6 Marks	L1	CO1	PO1
	b)	Applying Fourier integral theorem, show that $e^{-x}\cos x = \frac{2}{\pi}\int_0^\infty \frac{\lambda^2+2}{\lambda^4+4}\cos\lambda x\, d\lambda$.	6 Marks	L3	CO1	PO2

(OR)

2.	a)	Find the half-range sine series of $f(x) = \begin{cases} \frac{1}{4} - x, & 0 < x < \frac{1}{2} \\ x - \frac{3}{4}, & \frac{1}{2} < x < 1 \end{cases}$ *in* $0 \le x \le 1$	6 Marks	L1	CO1	PO1
	b)	Find the Fourier cosine transform of $f(x) = e^{-ax}$, $a > 0$ and hence deduce the integral $\int_0^\infty \frac{\cos px}{a^2+p^2}dp$	6 Marks	L1	CO1	PO1

UNIT-II

3.	a)	Determine $L\{f(t)\}$ *where* $f(t) = t^2 e^{-3t}\sin 2t$.	6 Marks	L3	CO1	PO1
	b)	Find the Laplace transform of $\int_0^t \frac{1-e^{-t}}{t}dt$.	6 Marks	L1	CO1	PO1

(OR)

4.	a)	Applying Laplace transforms, evaluate $\int_0^\infty te^{-3t}\sin t\, dt$.	6 Marks	L3	CO1	PO2
	b)	Find the Laplace transformation of the rectified semi-wave function defined by $f(t) = \begin{cases} \sin\omega t, & 0 < t < \pi/\omega \\ 0, & \pi/\omega < t < 2\pi/\omega \end{cases}$.	6 Marks	L1	CO1	PO2

UNIT-III

5.	a)	Find the inverse Laplace transform of $\frac{s+2}{(s^2+4s+5)^2}$.	6 Marks	L1	CO1	PO1
	b)	Applying convolution theorem, evaluate $L^{-1}\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$.	6 Marks	L3	CO1	PO2

(OR)

6.		Apply Laplace transform technique to solve $(D^2 - 2D + 1)x = e^t$, *if* $x(0) = 2, x'(0) = -1$.	12 Marks	L3	CO1	PO2

UNIT-IV

7.		Show the sum of the Eigen values of the matrix $A = \begin{bmatrix} 7 & 2 & 2 \\ -6 & -1 & 2 \\ 6 & 2 & -1 \end{bmatrix}$ is equal to the trace of the matrix and product of the Eigen values equal to its determinant.	12 Marks	L2	CO2	PO1

(OR)

8.	a)	Solve the system of linear equations $5x + 3y + 7z = 4,\ 3x + 26y + 2z = 9,\ 7x + 2y + 10z = 5$.	6 Marks	L3	CO2	PO1
	b)	Change the quadratic form $3x^2 + 5y^2 + 3z^2 - 2xy + 2xz - 2yz$ to sum of squares form by an orthogonal transformation.	6 Marks	L2	CO2	PO1

UNIT-V

9.		Suppose $T: R^2 \to P_1$ is a linear transformation such that $T\begin{bmatrix} 1 \\ 1 \end{bmatrix} = 2 - 3x + x^2$ and $T\begin{bmatrix} 2 \\ 3 \end{bmatrix} = 1 - x^2$, then find $T\begin{bmatrix} -1 \\ 2 \end{bmatrix}$ and $T\begin{bmatrix} a \\ b \end{bmatrix}$, where P_2 is a vector space of polynomials of degree at most two over R.	12 Marks	L1	CO2	PO2

(OR)

10.	a)	Show that the set $\{1+x,\ x+x^2,\ 1+x^2\}$ forms a basis for the vector space P_2 of polynomials of atmost degree two over R.	8 Marks	L2	CO2	PO1
	b)	Find the Linear transformation $T: R^3 \to R$ defined by $T(1,1,1) = 3,\ T(0,1,-2) = 1,\ T(0,0,1) = 2$.	4 Marks	L1	CO2	PO1

CODE No.: 19BT2BS02 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations August – 2021

APPLIED PHYSICS

[Civil Engineering, Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the terms: i) Total internal reflection. ii) Numerical Aperture. iii) V number.	8 Marks	L2	CO1	PO1
	b)	An optical fiber with 60 μm core diameter, carrying a light of wavelength 6000 Å and has refractive indices of core and cladding 1.55 and 1.50. Find the number of possible propagation modes (V number) through the fiber.	4 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Discuss the double crucible technique to fabricate optical fiber.	8 Marks	L2	CO1	PO1
	b)	Explain the principle and working of liquid level sensors.	4 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Summarize the classification of sound.	4 Marks	L2	CO1	PO1
	b)	Recall the Sabine's formula. Find the total absorption of sound in a hall of volume 1500m^3 and reverberation time of 0.5 s.	8 Marks	L1	CO1	PO2
		(OR)				
4.	a)	Explain principle, construction and working of magnetostriction method to produce ultrasonic waves.	8 Marks	L2	CO1	PO1
	b)	State various applications of ultrasonic waves.	4 Marks	L1	CO1	PO1
		UNIT-III				
5.	a)	Sketch the displacement-time curve, velocity-time curve and acceleration-time curve of a body in rectilinear motion.	6 Marks	L1	CO2	PO1
	b)	Derive an expression for maximum height and horizontal range of a projectile in inclined projection.	6 Marks	L3	CO2	PO2
		(OR)				
6.	a)	Derive an expression for the rotational moment of a wheel rotating about its own axis with an angular acceleration 'α'	6 Marks	L3	CO2	PO1 PO2
	b)	A flywheel of moment of inertia 5000kg m^2 having retardation 0.1 rad/s^2 loses its speed from 400 r.p.m to 300 r.p.m in 2 minutes. Calculate the change in its kinetic energy and angular moment.	6 Marks	L2	CO2	PO2
		UNIT-IV				
7.	a)	Define thermal conductivity and derive an expression for coefficient of thermal conductivity.	6 Marks	L1	CO2	PO1
	b)	Summarize the rectilinear flow of heat along a uniform bar.	6 Marks	L2	CO2	PO1
		(OR)				
8.		Elaborate the heat conduction through compound media in series and parallel.	12 Marks	L2	CO2	PO2
		UNIT-V				
9.	a)	Explain the preparation of metallic glasses by RF sputtering technique.	8 Marks	L2	CO3	PO1
	b)	List various applications of metallic glasses.	4 Marks	L1	CO3	PO2
		(OR)				
10.	a)	What are the shape memory alloys and outline the properties of NiTi alloy?	8 Marks	L1	CO3	PO1
	b)	List various applications of SMA.	4 Marks	L1	CO3	PO1

CODE No.: 19BT10201 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations August – 2021

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

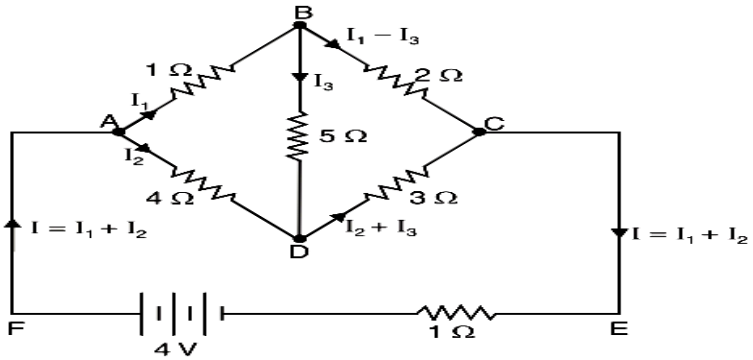
[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	With neat sketch, explain working principle of single loop generator.	6 Marks	L2	CO1	PO2
	b)	Derive the average, RMS value, Form Factor, Peak Factor for a sinusoidal waveform.	6 Marks	L3	CO1	PO2
		(OR)				
2.	a)	State and explain KVL and KCL with examples.	6 Marks	L1	CO1	PO1
	b)	Find the current in 5 ohm resistor.	6 Marks	L2	CO1	PO2



UNIT-II

3.	a)	With neat sketch, explain the working of various types of UPS.	6 Marks	L1	CO2	PO1
	b)	"The most economical power factor depends upon the relative costs of supply and power factor correction equipment but independent of the original power factor". Justify your answer with relative equations.	6 Marks	L1	CO2	PO1
		(OR)				
4.	a)	Sketch the typical layout and explain the operation of Hydro power plant.	6 Marks	L2	CO2	PO1
	b)	What are different types of circuit breaker? Explain any two of them with neat sketch.	6 Marks	L2	CO2	PO2

UNIT-III

5.	a)	3-φ 4-pole induction motor is supplied from 3φ 50Hz **ac** supply. Find : i) synchronous speed. ii) rotor speed when slip is 3%. iii) the rotor frequency when runs at 500 r.p.m.	6 Marks	L1	CO3	PO1
	b)	Explain the constructional details and operation of induction motor	6 Marks	L1	CO3	PO5
		(OR)				
6.	a)	Write a short notes on production of Rotating magnetic field	6 Marks	L1	CO3	PO1
	b)	With neat diagram, explain the working of a transformer.	6 Marks	L1	CO3	PO1

UNIT-IV

7.	a)	Draw and explain the circuit diagram of a full wave rectifier using four diodes and also sketch the waveforms.	6 Marks	L2	CO4	PO5
	b)	What is a zenerdiode? Distinguish between zener breakdown and avalanche breakdown.	6 Marks	L2	CO4	PO1
		(OR)				
8.	a)	Explain the input and output characteristics of transistor in CC configuration with neat sketch.	6 Marks	L2	CO4	PO2
	b)	Explain the operation of p-n junction diode in forward and reverse biased condition.	6 Marks	L1	CO4	PO1

UNIT-V

9.	a)	With the help of a circuit diagram, show that the op-amp can be used as non-inverting adder.	6 Marks	L1	CO5	PO1
	b)	List the six characteristics of an ideal op-amp and explain in detail. Give the practical op-amp equivalent circuit.	6 Marks	L3	CO5	PO4
		(OR)				
10.	a)	With a neat circuit diagram, explain the operation of a op-amp differentiator and derive an expression for the output of a practical differentiator.	6 Marks	L2	CO5	PO2
	b)	Design a no inverting amplifier that has a voltage gain of 10 using an ideal op-amp. The input signal is in the range from -1 V to 1 V. Use 5 % tolerance discrete resistors for the feedback network.	6 Marks	L3	CO5	PO4

CODE No.: 19BT10501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations August – 2021

PROGRAMMING FOR PROBLEM SOLVING

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Illustrate the algorithms implementation with necessary examples.	6 Marks	L1	C01	PO1
	b)	How to handle input and output in python?	6 Marks	L2	C01	PO1
		(OR)				
2.	a)	Describe Arithmetic Operators, Assignment Operators in detail with examples.	6 Marks	L1	C02	PO1
	b)	Discuss about keywords and identifiers in python.	6 Marks	L2	C01	PO1
		UNIT-II				
3.	a)	What are the different loop control statements available in Python? Explain with suitable examples.	6 Marks	L2	C02	PO1
	b)	Write a Python program to check if a 3 digit number is Armstrong number or not.	6 Marks	L1	C02	PO2
		(OR)				
4.	a)	Discuss about Iterative Statements with example.	6 Marks	L1	C02	PO1
	b)	Input five integers (+ve and −ve). Write Python code to find the sum of negative numbers, positive numbers and print them.	6 Marks	L1	C02	PO2
		UNIT-III				
5.	a)	Write a python program to sort a given list.	6 Marks	L1	C02	PO2
	b)	Illustrate about any three string handling methods with examples.	6 Marks	L1	C02	PO1
		(OR)				
6.	a)	Write Python program to check for the presence of a key in the dictionary and find the sum all its values.	6 Marks	L2	C02	PO2
	b)	Write Python program to implement any three queue operations.	6 Marks	L2	C02	P02
		UNIT-IV				
7.	a)	Discuss about scope and life time of variables with necessary examples.	6 Marks	L2	C01	PO1
	b)	Elucidate any four built in functions in math module.	6 Marks	L1	C02	PO2
		(OR)				
8.	a)	Write a program to find factorial of given number using recursion.	6 Marks	L1	C02	PO2
	b)	Develop a python script to copy data from one file to other file.	6 Marks	L2	C01	PO3
		UNIT-V				
9.	a)	Consider a frame contains student marks information. Write a script to display student details whose marks <60.	6 Marks	L3	C02	PO3
	b)	Discuss about scatter plots in python.	6 Marks	L2	C02	PO1
		(OR)				
10.	a)	Write a python script to print information and frequency counts of data set.	6 Marks	L1	C02	PO2
	b)	Discuss about Histogram in python.	6 Marks	L2	C02	PO2

❀ ❀ ❀

CODE No.: 19BT20101 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations August – 2021

CIVIL ENGINEERING MATERIALS AND CONCRETE TECHNOLOGY

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the geological classification of stones with examples.	4 Marks	L4	CO1	PO1 PO2
	b)	List out various tools for blasting and describe them.	4 Marks	L2	CO1	PO1
	c)	Write about classification of bricks.	4 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Discuss manufacturing process of bricks.	6 Marks	L4	CO1	PO1
	b)	Write various characteristics of a good tile.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Draw the structure of a tree and mention their components.	6 Marks	L4	CO1	PO1
	b)	Explain any four defects in timber.	6 Marks	L4	CO1	PO1 PO2
		(OR)				
4.	a)	List out various building materials for low cost housing and explain any two of them with their merits and de-merits.	6 Marks	L2	CO1	PO1 PO2
	b)	Describe briefly about paints and varnishes.	6 Marks	L4	CO1	PO1
		UNIT-III				
5.	a)	Explain the manufacturing process of ordinary Portland cement.	6 Marks	L4	CO1	PO1 PO2
	b)	Enumerate various cements and discuss any two types of cements with their proprieties.	6 Marks	L2	CO1	PO1
		(OR)				
6.	a)	Explain the classification of aggregates and discuss the properties of aggregates.	6 Marks	L4	CO1	PO1 PO2
	b)	What do you mean by bulking of sand and describe how to find out the bulking of sand.	6 Marks	L4	CO1	PO1 PO2 PO5
		UNIT-IV				
7.	a)	Define workability and explain how to find out workability of fresh concrete in laboratory.	6 Marks	L4	CO1	PO1 PO2
	b)	Discuss about segregation and bleeding of concrete.	6 Marks	L4	CO1	PO1
		(OR)				
8.		Explain various Non-destructive tests to be conducted on hardened concrete with neat sketches.	12 Marks	L4	CO1	PO1 PO2
		UNIT-V				
9.	a)	Define Shrinkage and explain the various types of shrinkage.	6 Marks	L4	CO1	PO1
	b)	Explain various factors affecting creep of concrete.	6 Marks	L4	CO1	PO1 PO2
		(OR)				
10.		Describe the procedure for Mix design of concrete as per IS 10262-2009.	12 Marks	L4	CO2	PO1 PO2

❀ ❀ ❀

CODE No.: 19BT20102 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

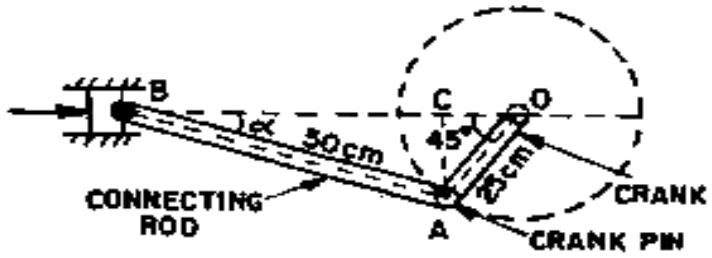
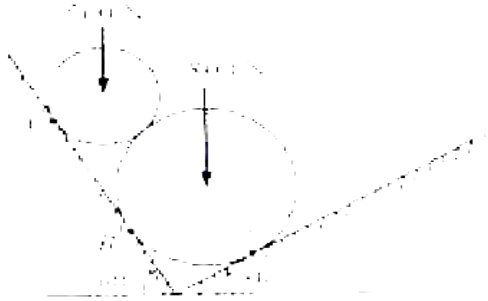
I B.Tech II Semester (SVEC-19) Supplementary Examinations August – 2021

ENGINEERING MECHANICS
[Civil Engineering]

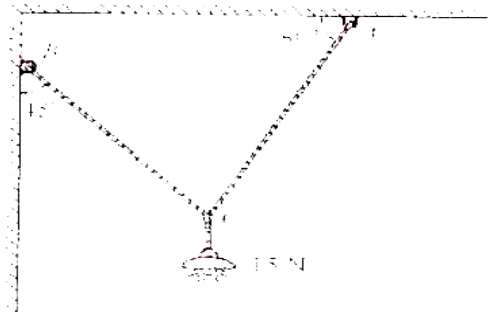
Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

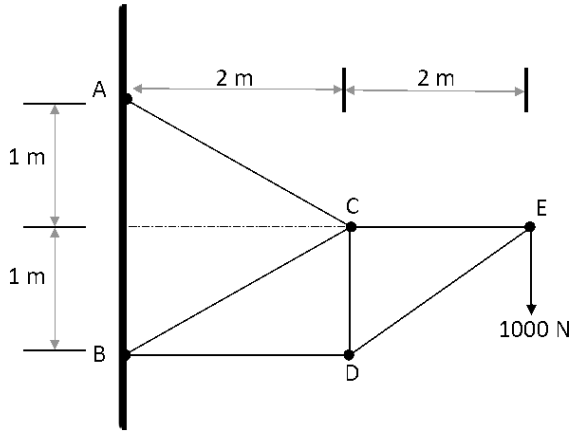
UNIT-I

1.	a)	Figure shows the connecting rod BA and crank AO. At the given position, the connecting rod exerts 2500N of force on crank pin at A. Resolve this force into vertical and horizontal components at A. Also resolve the given force at A along AO and perpendicular to AO. 	6 Marks	L3	CO1	PO1 PO2
	b)	Two smooth cylinders with diameters 250mm and 400mm respectively are kept in a groove with slanting surfaces making angles 60^0 and 30^0 as shown in the figure. Determine the reactions at contact points A, B and C. 	6 Marks	L4	CO1	PO1 PO2

(OR)

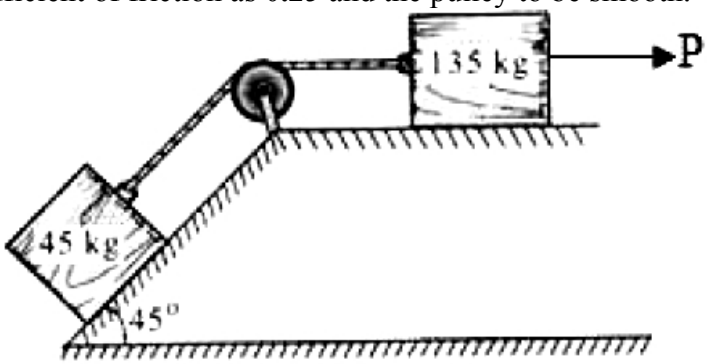
2.	a)	An electrical light weighing 15N hangs from a point C by the two strings AC and BC as shown in the figure. AC is inclined at 60^0 to the horizontal and BC at 45^0 to the vertical. Using Lami's theorem, find the forces in the strings AC and BC. Find the tension in each cable for the given figure. 	6 Marks	L4	CO1	PO1 PO2

	b)	A cantilever truss is loaded as shown in figure, find axial force in the members BC and CD.	6 Marks	L4	CO1	PO1 PO2



UNIT-II

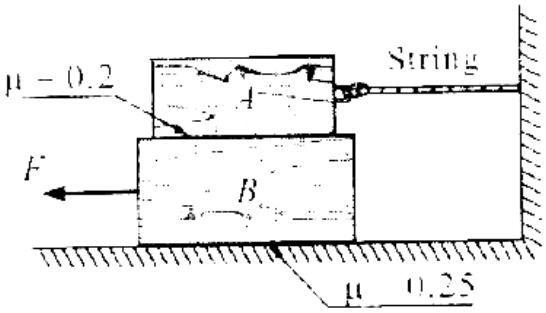
3.	a)	Determine the necessary force P acting parallel to the plane to cause motion to impend as shown in the figure. Assume coefficient of friction as 0.25 and the pulley to be smooth.	8 Marks	L4	CO1	PO1 PO2



	b)	Discuss briefly about ladder friction and wedge friction.	4 Marks	L2	CO1	PO1 PO2

(OR)

4.	a)	Discuss briefly about angle of repose and cone of friction.	4 Marks	L2	CO1	PO1 PO2
	b)	In the given figure, weights of two blocks A and B are 100N and 150N respectively. Find the smallest value of the horizontal force F to just move the lower block B if : i) the block is restrained by a string. ii) when the string is removed.	8 Marks	L4	CO1	PO1 PO2

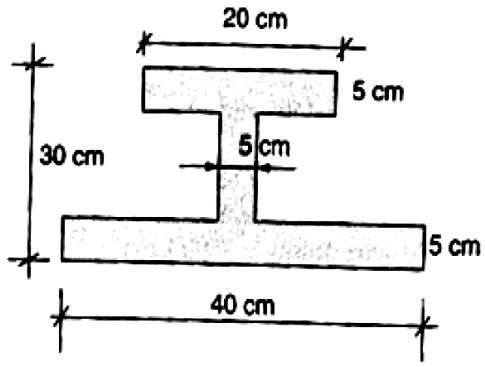


UNIT-III

5.	a)	Find the centroid of a quarter circular lines from basic principles.	6 Marks	L4	CO1	PO1 PO2
	b)	Derive the mass moment of inertia of a thin disc.	6 Marks	L4	CO1	PO1 PO2

(OR)

6.		Find the area moment of inertia about the centroidal axes for a given area shown in the figure.	12 Marks	L4	CO1	PO1 PO2



UNIT-IV

7.		A mild steel rod of 20mm diameter and 300mm long is enclosed centrally inside a hollow copper tube of external diameter 30mm and internal diameter of 25mm. The ends of the tube and rods are brazed together, and the composite bar is subjected to an axial pull of 40kN. If E for steel and copper is 200 GN/m^2 and 100 GN/m^2 respectively, find the stresses developed in the rod and tube. Also find the extension of the rod.	12 Marks	L4	CO1	PO1 PO2

(OR)

8.	a)	The safe stress, for a hollow steel column which carries an axial load of 2.2 x10^{3}kN is 120 MN/m^2. If the external diameter of the column is 25cm, determine the internal diameter.	6 Marks	L4	CO1	PO1 PO2
	b)	Find the modulus of elasticity for a rod, which tapers uniformly from 40mm to 25mm diameter in a length of 400mm. The rod is subjected to a load of 6 kN. Find the extension of the rod.	6 Marks	L4	CO1	PO1 PO2

UNIT-V

9.		A cylindrical shell 600mm diameter and 3m long, 10mm thick is subjected to 2.5MPa. E = 200GPa and μ = 0.25. Find: i) Change in length. ii) Change in diameter. iii) Change in volume. iv) Stresses. v) Strains.	12 Marks	L4	CO2	PO1 PO2

(OR)

10.	a)	A cylindrical vessel of 3mm thick, length and internal diameter of the vessel are 80cm and 30cm respectively. Determine the longitudinal and circumferential stresses in the cylindrical shell due to internal pressure of 1.5 N/mm^2. Take E = 2 x10^5 N/mm^2	5 Marks	L4	CO2	PO1 PO2
	b)	A thick pipe of 280mm external diameter and 200mm internal diameter is subjected to an internal pressure of 12MPa. What minimum external pressure can be applied so that the tensile stress in the metal shall not exceed 16MPa?	7 Marks	L4	CO2	PO1 PO2

CODE No.: 19BT20201 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations August – 2021

ELECTRIC CIRCUITS

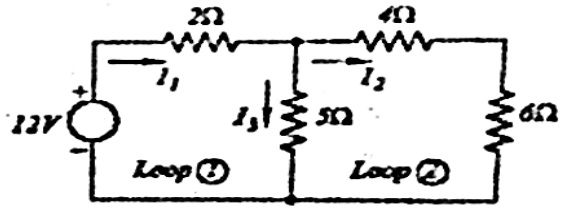
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

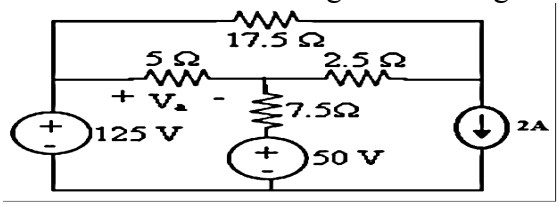
UNIT-I

1.	a)	Explain clearly about Star-delta and delta-Star transformation.	6 Marks	L3	CO1	PO2
	b)	In the network shown below, find all branch currents and voltage drops across all resistors.	6 Marks	L3	CO1	PO3

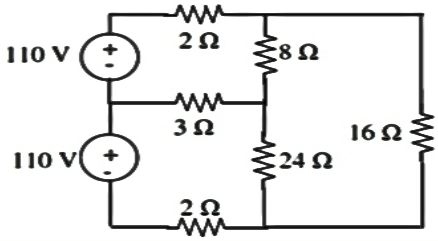


(OR)

2.	a)	Find the value of V_a for the following circuit using KVL.	6 Marks	L3	CO1	PO3

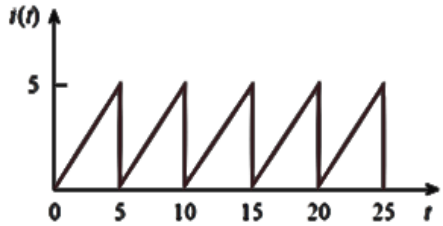


	b)	Using nodal analysis find all branch currents for the following circuit.	6 Marks	L3	CO1	PO2



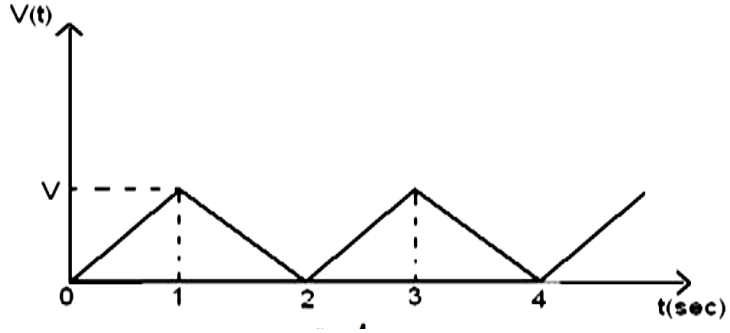
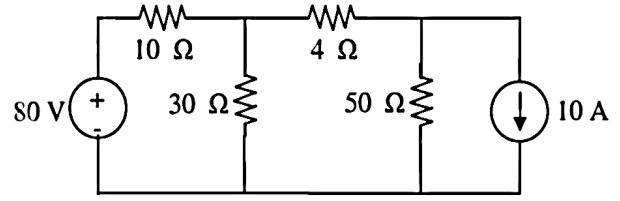
UNIT-II

3.	a)	Determine the effective value of the wave form shown in figure.	6 Marks	L3	CO1	PO2



	b)	An inductance of 0.5H, a resistance of 5Ω and a capacitance of 8μF are in series across a 220V ac supply. Calculate the frequency at which the current flowing through the circuit becomes maximum. Also, find bandwidth, half power frequencies and voltage across capacitance at resonance.	6 Marks	L1	CO2	PO1

(OR)

4.	a)	Find the form factor for the following waveform shown in figure below. 	6 Marks	L2	CO2	PO1
	b)	Elucidate measurement of power and power factor of a balanced 3 phase load with neat sketch using two watt meter method.	6 Marks	L2	CO2	PO1
		UNIT-III				
5.	a)	Show that under the condition of maximum power transfer, the efficiency of the circuit is 50 %.	6 Marks	L2	CO3	PO1
	b)	State and explain Millman's theorem with suitable example.	6 Marks	L3	CO1	PO1
		(OR)				
6.	a)	Verify Superposition theorem for 4Ω resistor for the following circuit. 	6 Marks	L1	CO3	PO2
	b)	Describe the concept of duality and dual pairs. Also state the procedure followed to interchange between dual pairs.	6 Marks	L3	CO3	PO3
		UNIT-IV				
7.	a)	Two similar coils connected in series gave a total inductance of 600 mH and when one of the coil is reversed, the total inductance is 300 mH. Determine the mutual inductance between the coils and coefficient of coupling.	6 Marks	L1	CO4	PO2
	b)	Two inductively coupled coils have self inductances L1= 50 mH and L2= 200 mH. If the coefficient of coupling is 0.5, i) Find the value of mutual inductance between the coils. ii) What is the maximum possible mutual inductance?	6 Marks	L2	CO4	PO2
		(OR)				
8.	a)	Discuss briefly about energy considerations in mutually coupled circuits.	6 Marks	L2	CO4	PO4
	b)	Derive the expression for equivalent inductance of two coil in parallel with i) Parallel aiding. ii) Parallel opposition.	6 Marks	L2	CO4	PO4
		UNIT-V				
9.	a)	What is a constant K low pass filter, derive its characteristics impedance.	6 Marks	L2	CO4	PO2
	b)	Explain the design procedure for a constant K low pass filter and its characteristics.	6 Marks	L3	CO4	PO3
		(OR)				
10.	a)	Derive the expression for characteristic impedance in a pass band filter.	6 Marks	L3	CO4	PO4
	b)	Derive necessary expressions for m-derived high pass filter.	6 Marks	L2	CO4	PO1

CODE No.: 19BT20241 SVEC-19

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations August – 2021

NETWORK ANALYSIS

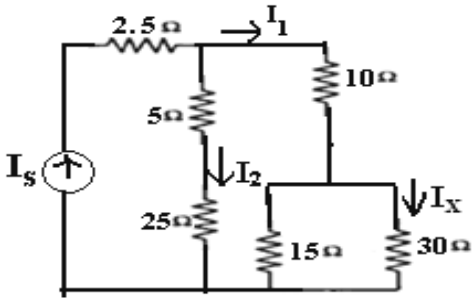
[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

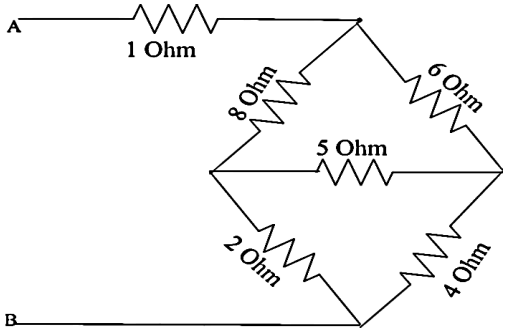
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) With reference to the circuit shown in figure below, find : 6 Marks L3 CO1 PO2
   i) I_x if I_1=12mA. ii) I_1 if Ix=12mA.
   iii) I_x if I_2=15mA. iv) I_x if Is=60mA.

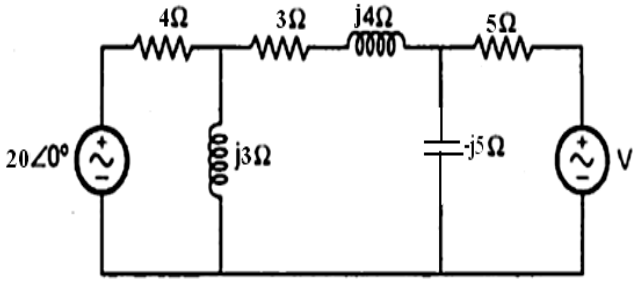


   b) Find equivalent resistance across terminals A-B for the circuit shown below. 6 Marks L3 CO1 PO2

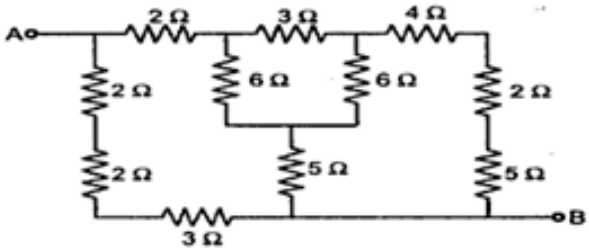


(OR)

2. a) Determine the value of 'V' such that the current in (3+j4Ω) is zero. 6 Marks L4 CO1 PO2



   b) Find the effective resistance between points A and B for the given circuit. 6 Marks L3 CO1 PO2

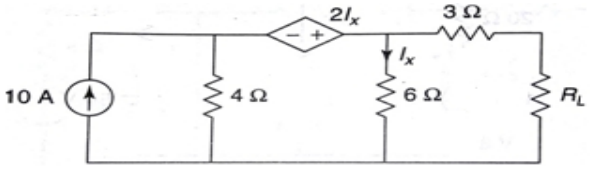


UNIT-II

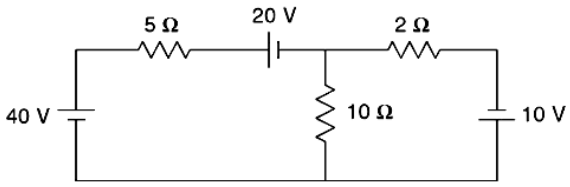
3.	a)	A two element series circuit is connected across AC source given by V=200√2Sin(314t+20º).The current in the circuit is found to be i=10√2 cos(314 t-25º).Determine the parameters of the circuit. Also determine the power factor, real power and reactive power taken by the circuit.	6 Marks	L3	CO2	PO2
	b)	Explain the sinusoidal response of series RL circuit.	6 Marks	L2	CO1	PO2
		(OR)				
4.	a)	Mention the properties of series resonant circuit.	4 Marks	L2	CO1	PO2
	b)	A series RLC circuit consists of 50Ω resistance, 0.2 H inductance and 10μF capacitance with applied voltage of 20V. Determine resonant frequency .Find Q- factor of the circuit .Compute the lower and upper frequency limits and the bandwidth of the circuit.	8 Marks	L3	CO2	PO2

UNIT-III

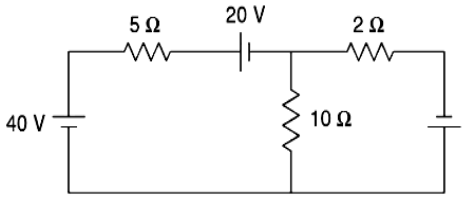
5.	a)	For the network shown below calculate the maximum power delivered to load resistance R_L.	8 Marks	L3	CO1	PO2



	b)	State and illustrate Millmann's theorem with an example.	4 Marks	L3	CO1	PO2
		(OR)				
6.	a)	Find the current through 2Ω resistor using Thevenin's theorem.	6 Marks	L3	CO1	PO2

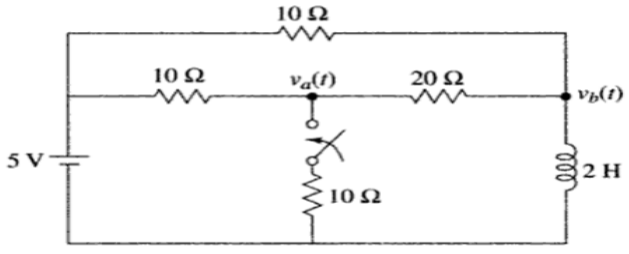


	b)	Find the current through 2Ω resistor using super position theorem.	6 Marks	L3	CO1	PO2



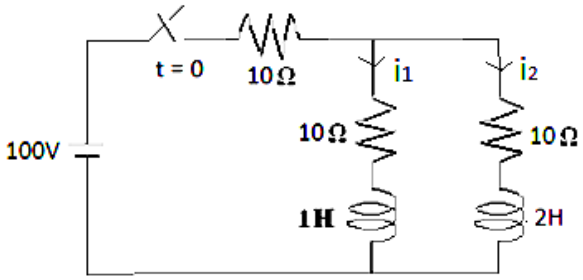
UNIT-IV

7.	a)	A series RL circuit with initial condition I_0 in the inductor is connected to a DC voltage V at t=0, Derive expression for the instantaneous current through the inductor for t >0.	6 Marks	L3	CO1	PO2
	b)	In the network shown in fig. a steady state is reached with the switch open.At t=0 ,the switch is closed .For the element values given , Determine the values of $V_a(0^-)$,$V_b(0^-)$,$V_a(0^+)$ and $V_b(0^+)$.	6 Marks	L3	CO2	PO2



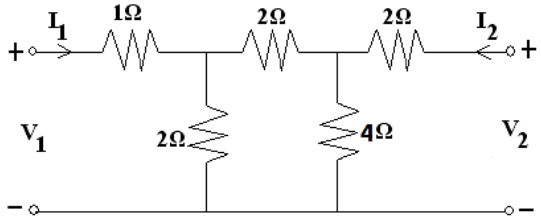
(OR)

8.	a)	Obtain the DC response for a simple RL circuit with differential equations approach.	4 Marks	L2	CO1	PO2
	b)	In the circuit diagram shown in fig the switch S is closed at t=0 with the network previously unenergized. Use laplace transform method and evaluate $i_1(t)$.	8 Marks	L3	CO2	PO6



UNIT-V

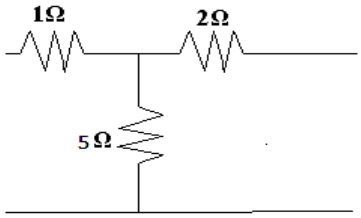
9.	a)	Find the Y parameters for the network.	6 Marks	L3	CO1	PO2



	b)	Show that the overall Z-parameters for series connected two-port networks is simply the sum of Z matrices of the individual network.	6 Marks	L2	CO1	PO2

(OR)

10.	a)	Determine the Z- parameters of the T-network.	6 Marks	L3	CO1	PO2



	b)	Establish the relationship between Y and Z parameters..	6 Marks	L2	CO1	PO2

CODE No.: 19BT20301 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations August – 2021

BASIC ENGINEERING MECHANICS

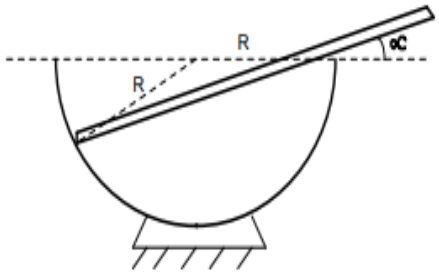
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

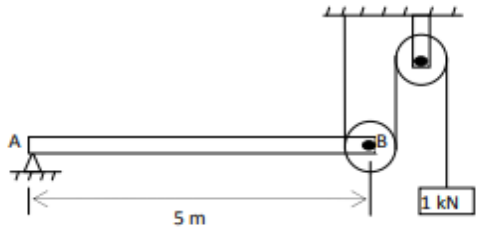
UNIT-I

1.	a)	Explain Lami's Theorem.	4 Marks	L2	CO1	PO1
	b)	Find the resultant of a system of concurrent, coplanar forces as F_1=(500N, 0^0) F_1=(300N, 45^0) F_1=(400N, 180^0) F_1= (200N, -150^0) F_1=(100N, -60^0) .	8 Marks	L2	CO1	PO1 PO2
		(OR)				
2.		If a rod of length 3R is placed horizontally in a hemispherical bowl of radius R, determine the angle α the rod will make with the horizontal for the rod to be in equilibrium. Neglect friction between the bowl and the rod and assume that the bowl does not rock.	12 Marks	L2	CO1	PO1 PO2



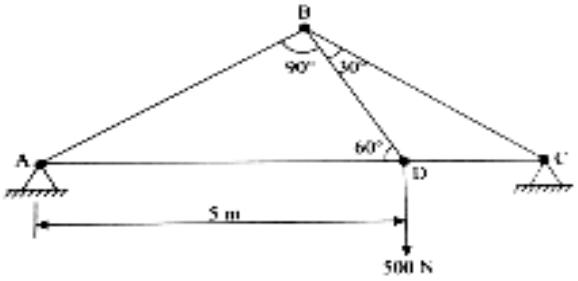
UNIT-II

3.	a)	State and prove Varignon's theorem.	4 Marks	L2	CO1	PO1
	b)	A beam hinged at A is supported in a horizontal position by a rope passing over a pulley arrangement as shown figure. The free end of the rope supports a load of 1500 N. The weight of the beam is 2 kN and that of pulley hinged at B is 400 N. Determine the tension in the rope, assuming the pulleys to be frictionless, and the reaction at A.	8 Marks	L2	CO1	PO1 PO2

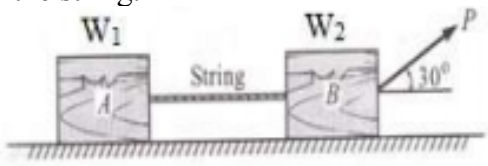
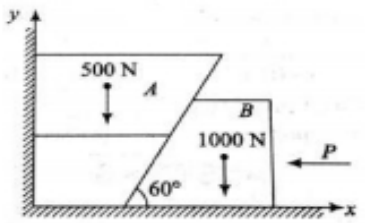


(OR)

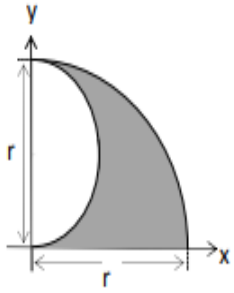
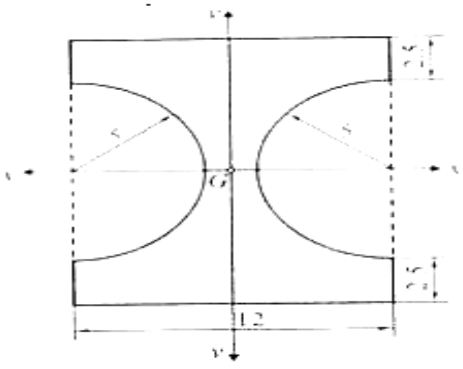
4.		A truss is loaded as shown in figure. Find the forces in members AB, BD and BC.	12 Marks	L2	CO1	PO1 PO2



UNIT-III

5.		The two blocks (A=30 N and B=50 N) are placed on the rough horizontal plane. Coefficient of friction between the block A and the plane is 0.3 and that between B and the plane is 0.2. Find the minimum value of the force P to just move the system. Also find the tension in the string. 	12 Marks	L2	CO1	PO1 PO2
		(OR)				
6.		Two blocks A and B are resting against a wall and the floor as shown in figure. Find the value of the horizontal force P applied to the lower block that will hold the system in equilibrium. Coefficients of frictions are 0.25 at the floor, 0.3 at the wall and 0.2 between the blocks. 	12 Marks	L2	CO1	PO1 PO2

UNIT-IV

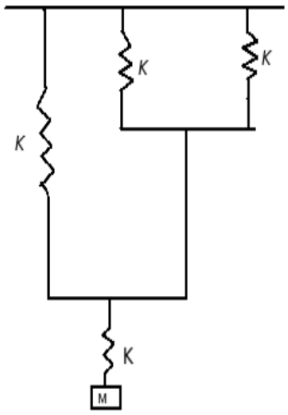
7.	a)	Find the centroid for the shaded area shown. 	6 Marks	L3	CO2	PO1 PO2
	b)	State and prove Parallel Axis theorem.	6 Marks	L3	CO2	PO1
		(OR)				
8.		Find the moment of inertia of the plane area, about centriodal x and y-axis. 	12 Marks	L3	CO2	PO1 PO2

UNIT-V

9.	a)	An elevator of mass 2500kg is moving vertically downwards with a constant acceleration. Starting from rest, it travels a distance of 35m during an interval of 10 seconds. Find the cable tension during this time. Neglecting all other resistances to motion, what are the limits of cable tension?	10 Marks	L2	CO3	PO1 PO2
	b)	Define impulse-momentum principle.	2 Marks	L2	CO3	PO1

(OR)

10.	a)	Define the following terms: i) Periodic motion. ii) Fundamental mode of vibration. iii) Degree of freedom. iv) Simple harmonic motion.	6 Marks	L2	CO4	PO1
	b)	Calculate equivalent stiffness of the spring for the system shown below, which has spring stiffness of 3000 N/m.	6 Marks	L2	CO4	PO1 PO2



CODE No.: 19BT20302 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations August – 2021

MATERIAL SCIENCE AND ENGINEERING
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		What is a crystal defect? Discuss various types of crystal defects.	12 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Define Space lattice. Differentiate between BCC and FCC crystal structures.	6 Marks	L2	CO1	PO2
	b)	What is critically resolved shear stress? Explain its significance.	6 Marks	L3	CO1	PO2
		UNIT-II				
3.	a)	Distinguish between annealing and normalizing.	6 Marks	L3	CO1	PO1
	b)	Write a short note on continuous cooling transformation diagrams.	6 Marks	L1	CO1	PO2
		(OR)				
4.		What is case hardening? Discuss various methods of case hardening.	12 Marks	L1	CO1	PO2
		UNIT-III				
5.	a)	Discuss how steels are specified by BIS standards with suitable examples.	6 Marks	L1	CO2	PO7
	b)	Write short notes on structure properties and applications of tool steels.	6 Marks	L1	CO2	PO3
		(OR)				
6.	a)	What are the various properties and applications of : i) Low carbon steels. ii) Hadfield manganese steels.	6 Marks	L1	CO2	PO3
	b)	Write short notes on: i) Nodular cast iron. ii) Chilled cast iron.	6 Marks	L1	CO2	PO1
		UNIT-IV				
7.	a)	List the properties and applications of Beryllium and its alloys.	6 Marks	L2	CO2	PO3
	b)	List the properties and applications of Titanium and its alloys.	6 Marks	L2	CO2	PO3
		(OR)				
8.		Discuss the structure, properties and applications of Aluminum and its alloys.	12 Marks	L1	CO2	PO3
		UNIT-V				
9.		Discuss various types of fiber reinforced composites and their applications.	12 Marks	L2	CO2	PO3 PO7
		(OR)				
10.	a)	What is a polymerization reaction? What are the various ways of classifying polymers?	6 Marks	L1	CO2	PO2
	b)	Discuss the various properties and application of ceramics.	6 Marks	L1	CO2	PO3

CODE No.: 19BT20501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations August – 2021

DIGITAL LOGIC DESIGN

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Each of the following arithmetic operations is correct in at least one number system. Determine the possible bases of the numbers in each operation. i) 1234 + 5432 = 6666. ii) 41/3 = 13.	6 Marks	L2	CO1	PO1
	b)	Represent the following decimal numbers in Excess-3 code. i) 286 ii) 807 iii) 429.5	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Express the following functions in a sum of minterms. i) F = D(A' + B) + B'D ii) F = xy + x'y' + y'z	6 Marks	L2	CO1	PO1
	b)	Convert the following Gray codes to binary number. i) 10011. ii) 101110. iii) 100010110.	6 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Reduce the following expression using K-map and implement using NAND gates: $F = \sum m(9,10,12) + d(3,5,6,7,11,13,14,15)$	6 Marks	L3	CO1	PO2
	b)	Implement EX-NOR and NOR gates with minimum number of NAND gates only.	6 Marks	L2	CO1	PO1
		(OR)				
4.	a)	Obtain the minimal SOP expression for $F = \prod M(0,1,2,4,5,6,9,11,12,14,15)$	6 Marks	L3	CO1	PO2
	b)	Obtain the reduced expression $F = \sum m(2,4,6,8,10,12,15)$ using K-map and realize with NOR gates.	6 Marks	L3	CO1	PO2

UNIT-III

5.	a)	Design a combinational circuit with four inputs and four outputs. The output generates the 2's complement of the input binary number.	6 Marks	L4	CO2	PO4
	b)	Implement full adder with two half adders.	6 Marks	L4	CO2	PO2
		(OR)				
6.	a)	Construct 4 x 1 Multiplexer using two 2 x 1 Multiplexers.	6 Marks	L4	CO2	PO4
	b)	Design the 4-bit BCD adder using 4-bit binary adders and explain its operation.	6 Marks	L4	CO2	PO4

UNIT-IV

7.	a)	Illustrate the function of JK flip-flop using NAND gates in detail.	6 Marks	L4	CO2	PO1
	b)	Draw the logic diagram of mod 6 ripple counter using T flip-flops and explain its operation.	6 Marks	L4	CO2	PO2
		(OR)				
8.	a)	Design a MOD 8 parallel counter using T flip-flops.	6 Marks	L4	CO2	PO4
	b)	Describe the operation of SR flip-flop in detail.	6 Marks	L4	CO2	PO2

UNIT-V

9.	a)	Give the logic implementation of a 32 x 4 bit ROM using a decoder of a suitable size.	6 Marks	L4	CO2	PO2
	b)	Show how the PLA circuit would be programmed to implement the 3 bit binary to gray conversion.	6 Marks	L4	CO2	PO1
		(OR)				
10.	a)	Realize the following functions using PROM of size 8 x 3: $F_1 = \sum m(0,4,7)$; $F_2 = \sum m(1,3,6)$; $F_3 = \sum m(1,2,4,6)$	6 Marks	L4	CO2	PO2
	b)	Write the program table to implement a BCD to Excess-3 code conversion using a PLA.	6 Marks	L4	CO2	PO1

CODE No.: 19BT21501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations August – 2021

OBJECT ORIENTED PROGRAMMING THROUGH JAVA
[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the following object oriented concepts. i) Abstraction. ii) Polymorphism.	6 Marks	L1	CO1	PO1
	b)	Explain the use of "this" keyword with an example.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Discuss about access control mechanism in Java.	6 Marks	L2	CO1	PO1
	b)	Differentiate Function Oriented Programming and Object Oriented Programming.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Explain the differences between String and String Buffer class with an example.	6 Marks	L2	CO1	PO1
	b)	Write about various ways of parameter passing mechanisms in Java with an example.	6 Marks	L3	CO1	PO1
		(OR)				
4.	a)	Explain constructor overloading with an example.	6 Marks	L2	CO1	PO5
	b)	What is the use of String Tokenizer? Discuss with an example.	6 Marks	L2	CO1	PO5
		UNIT-III				
5.	a)	What is user defined package? Explain the steps involved in creating the user defined package with an example.	6 Marks	L3	CO2	PO11
	b)	Illustrate the use of "super" and "Final" keyword in Java.	6 Marks	L1	CO2	PO2
		(OR)				
6.	a)	What is method binding? Explain with an example.	6 Marks	L1	CO2	PO2
	b)	Explain concept of multiple inheritance with suitable program.	6 Marks	L1	CO2	PO5
		UNIT-IV				
7.	a)	Discuss Inter thread communication with an example.	6 Marks	L2	CO2	PO5
	b)	Write a Java program to implement multithreading.	6 Marks	L3	CO2	PO6
		(OR)				
8.	a)	Demonstrate nested try and final statements in exception handling.	6 Marks	L2	CO2	PO11
	b)	Write a Java program to demonstrate Array Index Out of Bounds exception and divide by zero exception with an example.	6 Marks	L2	CO2	PO11
		UNIT-V				
9.	a)	Write a Java program to design calculator using AWT.	6 Marks	L3	CO3	PO11
	b)	Write the procedure to handle events using event Listeners.	6 Marks	L3	CO3	PO11
		(OR)				
10.	a)	Discuss about card and border layouts with suitable example.	6 Marks	L2	CO3	PO1
	b)	Write a Java program using the following: i) JTable ii) JTabbedPane.	6 Marks	L2	CO3	PO1

CODE No.: 19BT1BS02 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations January – 2022

BIOLOGY FOR ENGINEERS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		Summarize the different types of taxonomy, uses and significance of molecular taxonomy. List out the different Molecular taxonomical methods.	12 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Compare the differences between Prokaryotes and Eukaryotes.	6 Marks	L2	CO1	PO2
	b)	How living organisms are classified based on the carbon and energy resources?	6 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Define bio-molecule. Explain the structures and functions of DNA.	6 Marks	L1	CO2	PO1
	b)	Classify carbohydrates with examples.	6 Marks	L2	CO1	PO2
		(OR)				
4.		What are enzymes? Describe its mechanism of action, factors affecting enzyme activity and industrial applications.	12 Marks	L1	CO1	PO1
		UNIT-III				
5.		Illustrate the mechanism and process of central dogma of molecular biology with a neat diagram of Replication, Transcription and Translation.	12 Marks	L2	CO2	PO1
		(OR)				
6.		Explain Mendel's Law of segregation and Law of Assortment with the help of Punnett's square.	12 Marks	L2	CO2	PO1
		UNIT-IV				
7.		Recall the definition of recombinant DNA technology and depict the general cloning methods and procedures.	12 Marks	L1	CO3	PO1
		(OR)				
8.	a)	Outline the role of biosensors and biochips.	6 Marks	L2	CO3	PO6
	b)	Relate the pros and cons of recombinant vaccines.	6 Marks	L2	CO3	PO6
		UNIT-V				
9.	a)	How will you solve the problem of two parents claiming a single baby as their own child with DNA finger printing?	6 Marks	L1	CO3	PO6
	b)	Demonstrate the role of EEG in medical diagnostics.	6 Marks	L2	CO3	PO6
		(OR)				
10.		List the contrast characteristic features of the human digestive system and Respiratory system with neat diagram.	12 Marks	L1	CO1	PO1

CODE No.: 19BT1BS03 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations January - 2022

ENGINEERING PHYSICS

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Discuss the phenomenon of interference in thin films. Obtain the conditions for maxima and minima.	9 Marks	L2	CO1	PO1
	b)	In Newton's ring experiment, the diameters of 4^{th} and 12^{th} dark rings are 0.4 cm and 0.7 cm respectively. Calculate the diameter of 20^{th} dark ring.	3 Marks	L3	CO1	PO2
		(OR)				
2.		Describe the theory of Fraunhofer diffraction due to a single slit and hence obtain the condition for primary and secondary maxima.	12 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Explain the physical significance of Maxwell's equations.	4 Marks	L2	CO2	PO1
	b)	Derive the free space electromagnetic wave equations and show that the velocity of the electromagnetic wave is $\frac{1}{\sqrt{\mu_0 \varepsilon_0}}$.	8 Marks	L3	CO2	PO2
		(OR)				
4.	a)	Define critical angle. Derive an expression for acceptance angle and numerical aperture of an optical fibre.	9 Marks	L3	CO2	PO1
	b)	List any three losses in optical fibers.	3 Marks	L1	CO2	PO1
		UNIT-III				
5.	a)	Develop an expression for number of electrons per unit volume in conduction band of an intrinsic semiconductor.	8 Marks	L3	CO3	PO1 PO2
	b)	The Hall co-efficient of a silicon specimen was found to be $-7.35 \times 10^{-5} m^3/C$ at 300K. Determine the nature of the semiconductor. If the conductivity was found to be $200 \Omega^{-1} m^{-1}$, calculate the density and mobility of the charge carriers.	4 Marks	L3	CO3	PO2
		(OR)				
6.	a)	Classify solid materials based on energy band diagrams.	5 Marks	L2	CO3	PO1
	b)	Describe the formation and characteristics of p-n junction diode with suitable diagrams.	7 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	Define Local field. Derive an expression for the local field inside a dielectric material.	8 Marks	L3	CO4	PO1 PO2
	b)	Discuss the frequency dependence of polarizability.	4 Marks	L2	CO4	PO1
		(OR)				
8.	a)	Explain the origin of magnetic dipole moment due orbital and spin motion of an electron.	6 Marks	L2	CO4	PO1
	b)	Classify the magnetic materials using B-H curve.	6 Marks	L2	CO4	PO1

UNIT-V

9.	a)	Define terms critical temperature and critical field. Distinguish Type-I and Type-II superconductors.	8 Marks	L4	CO5	PO1
	b)	List any five applications of superconductors.	4 Marks	L1	CO5	PO1
		(OR)				
10.	a)	Using pulsed laser deposition technique, explain the synthesis of nano films.	8 Marks	L2	CO5	PO1
	b)	Identify any four applications of Nanomaterials.	4 Marks	L3	CO5	PO1

CODE No.: 19BT1BS04 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations January – 2022

ENGINEERING CHEMISTRY

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Identify the magnetic behavior and bond order of carbon oxide molecule based on its energy level diagram.	6 Marks	L3	CO1	PO2
	b)	Derive the expression for Schrodinger wave equation.	6 Marks	L3	CO1	PO1
		(OR)				
2.		Discuss the postulates of molecular orbital theory.	12 Marks	L2	CO1	PO1
		UNIT-II				
3.		Central Water Commission of Tirupati section reports on underground water sample (in mg/L) at the proposed site for the construction of thermal power plant (300 MW) near Rangampet is as follows: $Ca(HCO_3)_2$ = 111, $CaSO_4$ = 198, $MgCl_2$ = 80, $Mg(HCO_3)_2$ = 56, $MgSO_4$ = 184, DO = 12 and Na_2CO_3 = 125. Predict the operation troubles suffered by the boiler and write their disadvantages, reactions and removal methods for the predicted boiler operation troubles.	12 Marks	L3	CO2	PO2
		(OR)				
4.		Explain the Nalgonda defluoridation method and mention the adverse effect of fluorides on human health.	12 Marks	L2	CO2	PO6
		UNIT-III				
5.	a)	Explain the how underground pipelines and cables can be protected from corrosion.	6 Marks	L2	CO3	PO2
	b)	Write a short note on construction and working of methanol-oxygen fuel cell with chemical reactions involved in it.	6 Marks	L1	CO3	PO1
		(OR)				
6.	a)	Describe the construction and working of lead acid battery with chemical reactions involved in it.	7 Marks	L2	CO3	PO1
	b)	Define electroplating and mention the conditions required for Ni electroplating.	5 Marks	L1	CO3	PO1
		UNIT-IV				
7.	a)	Write the applications of X-ray diffraction technique.	6 Marks	L1	CO4	PO1
	b)	Illustrate Bathochromic shift and Hypsochromicshift.	6 Marks	L2	CO4	PO1
		(OR)				
8.		Discuss the principle and working of an IR spectrometer with the help of a block diagram.	12 Marks	L2	CO4	PO1
		UNIT-V				
9.	a)	Describe the Fischer-Tropsch method with a neat diagram and write the advantages, disadvantages of synthetic petrol.	8 Marks	L2	CO5	PO1
	b)	Define flash point and fire point of a lubricant and explain their significance.	4 Marks	L1	CO5	PO1

(OR)

10.	a)	Define lubrication. Illustrate the mechanism of thin film and extreme pressure lubrication.	8 Marks	L2	CO5	PO1
	b)	A coal has following composition by weight C = 90%, O = 3%, S =0.5%, N = 0.5% and ash = 2.5%. Net calorific value of the coal was found to be 8490 kcal/kg. Calculate the high calorific value of coal.	4 Marks	L3	CO5	PO2

CODE No.: 19BT1HS01 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations January - 2022

COMMUNICATIVE ENGLISH

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		Discuss the merits and demerits of assertive communication.	12 Marks	L4	CO1	PO2
		(OR)				
2.	a)	Explain communicative competence and the need for communicating in English at the work place.	6 Marks	L2	CO1	PO1
	b)	Explain in brief about verbal and non-verbal communication.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.		How can you overcome the barriers that affect the process of listening?	12 Marks	L4	CO1	PO2
		(OR)				
4.	a)	Differentiate listening from hearing with suitable examples.	6 Marks	L4	CO1	PO2
	b)	Identify different kinds of listening modes.	6 Marks	L3	CO1	PO5
		UNIT-III				
5.		"Conferences are useful in arriving at possible solutions to some problems". Discuss with suitable examples.	12 Marks	L2	CO1	PO1
		(OR)				
6.	a)	Discuss various steps for organizing a symposium.	6 Marks	L2	CO1	PO1
	b)	Persuasive techniques are used to motivate audience to be attentive. Discuss.	6 Marks	L2	CO1	PO5 PO10
		UNIT-IV				
7.		Discuss why you need to apply study skills in order to make the most of your comprehension.	12 Marks	L2	CO1	PO5 PO10
		(OR)				
8.	a)	Explain how you can use the understanding of discourse markers to develop ideas and relate them to one another.	6 Marks	L2	CO1	PO10
	b)	Discuss how you would apply the ways in which comprehension skills can be improved.	6 Marks	L3	CO1	PO5
		UNIT-V				
9.		Illustrate how would you categorize different types of essays depending on the purpose they fulfil.	12 Marks	L2	CO1	PO5 PO10
		(OR)				
10.	a)	Explain how would you achieve effective technical documentation by accentuating the positives and avoiding plagiarism.	6 Marks	L4	CO1	PO2
	b)	Discuss how can you compose coherent and meaningful paragraphs using cohesion and coherence.	6 Marks	L4	CO1	PO2

❀ ❀ ❀

CODE No.: 19BT2BS01 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations January – 2022

TRANSFORMATION TECHNIQUES AND LINEAR ALGEBRA

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Determine the Fourier series for the function $f(x) = x^2 - 2$ *in* $-2 \le x \le 2$.	4 Marks	L4	CO1	PO1
	b)	Find the Fourier transform of $f(x) = \begin{cases} a^2 - x^2, & if \ \|x\| < a \\ 0, & if \ \|x\| > a > 0 \end{cases}$ and hence deduce that $\int_0^\infty \frac{\sin x - \cos x}{x^3} dx = \frac{\pi}{4}$.	8 Marks	L1	CO1	PO1

(OR)

2.	a)	Establish half-range sine series for $f(x) = x^2$ *in* $0 < x < 4$.	6 Marks	L1	CO1	PO1
	b)	Find the Fourier cosine transform of e^{-ax}, $a > 0$ and hence deduce the integral $\int_0^\infty \frac{\cos px}{a^2 + p^2} dp$.	6 Marks	L1	CO1	PO1

UNIT-II

3.	a)	Find $L\{f(t)\}$, where *f(t)* is a periodic function of period 2π and it is given by $f(x) = \begin{cases} \sin t, & 0 < t < \pi \\ 0, & \pi < t < 2\pi \end{cases}$.	6 Marks	L1	CO1	PO1
	b)	Find the Laplace transform of the integral $\int_0^t \frac{e^t \sin t}{t} dt$.	6 Marks	L1	CO1	PO2

(OR)

4.	a)	Find the Laplace transform of *f(t)* where $f(t) = \begin{cases} e^t, & 0 < t < 5 \\ 3, & t > 5 \end{cases}$.	6 Marks	L1	CO1	PO1
	b)	Making use of Laplace transform, evaluate $\int_0^\infty te^{-t} \sin t dt$.	6 Marks	L3	CO1	PO2

UNIT-III

5.		By applying the technique of Laplace transforms, solve the differential equation $\frac{d^2y}{dt^2} + 2\frac{dy}{dt} + 5y = e^{-t} \sin t$, given that $y(0) = 0; y'(0) = 1$.	12 Marks	L3	CO1	PO2

(OR)

6.	a)	Find the inverse Laplace transform of $\log\left(\frac{s^2+4}{s^2+9}\right)$.	6 Marks	L1	CO1	PO1
	b)	Apply convolution theorem to evaluate $L^{-1}\left\{\frac{1}{(s-2)(s+2)^2}\right\}$.	6 Marks	L3	CO1	PO2

UNIT-IV

7.		Find an orthogonal matrix which diagonalizes $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 3 & -1 \\ 0 & -1 & 3 \end{bmatrix}$ and hence write the diagonal matrix.	12 Marks	L1	CO2	PO1
		(OR)				
8.		Change the quadratic form $3x^2+2y^2+3z^2-2xy-2yz$ to canonical form by orthogonal transformation and also find its nature.	12 Marks	L2	CO2	PO2

UNIT-V

9.	a)	In the vector space P_2, of all polynomials of degree atmost two, determine whether the set $\{1+x+x^2, 1-x+3x^2, 1+3x-x^2\}$ is linearly independent or not.	6 Marks	L3	CO2	PO1
	b)	Let $T: R^2 \to P_2$, where P_2 is a polynomial function of degree two be a linear transformation such that $T\begin{bmatrix}1\\1\end{bmatrix} = 2-3x+x^2$ *and* $T\begin{bmatrix}2\\3\end{bmatrix} = 1-x^2$ *then find* $T\begin{bmatrix}-1\\2\end{bmatrix}$.	6 Marks	L1	CO2	PO2
		(OR)				
10.	a)	Show that the set $B=\{1+x, x+x^2, 1+x^2\}$ is a basis for the vector space P_2 of polynomials of atmost degree two over R.	6 Marks	L1	CO2	PO1
	b)	Find the Linear transformation $T: R^2 \to R^2$ such that $T(2,3) = (4,5)$, $T(1,0) = (0,0)$.	6 Marks	L1	CO2	PO1

CODE No.: 19BT2BS02 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations January - 2022

APPLIED PHYSICS
[Civil Engineering, Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the differences between the step index fiber and graded index fibers.	8 Marks	L2	CO1	PO1
	b)	Calculate the numerical aperture and acceptance angle for an optical fiber with core and cladding refractive indices being 1.48 and 1.45 respectively.	4 Marks	L3	CO1	PO2
		(OR)				
2.	a)	What is an optical fiber? What is the principle involved in its working? Derive an expression for acceptance angle of an optical fiber and how it is related to numerical aperture.	9 Marks	L1	CO1	PO1
	b)	Mention the applications of optical fibers in various fields.	3 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Write a note on reverberation and reverberation time. Derive Sabine's mathematical relation for reverberation time.	9 Marks	L1	CO1	PO1
	b)	A hall with a volume of $1000m^3$ has a sound absorbing surface of area of $400m^2$. If the average absorption coefficient of the hall is 0.2 Sabin. What is the reverberation time of the hall?	3 Marks	L1	CO1	PO2
		(OR)				
4.	a)	Explain the production of ultrasonic waves using inverse piezoelectric method with a neat diagram.	8 Marks	L2	CO1	PO1
	b)	With a neat block diagram, explain sonogram.	4 Marks	L2	CO1	PO1
		UNIT-III				
5.	a)	Define the terms: Rectilinear motion and Curvilinear motion.	6 Marks	L1	CO2	PO1
	b)	Show that the area under the v-t curve and the area under the a-t curve represent displacement and the velocity of the moving body respectively.	6 Marks	L1	CO2	PO2
		(OR)				
6.	a)	Derive an expression for the centripetal acceleration of a body moving along a curved path of radius (r) with a uniform velocity (v).	6 Marks	L2	CO2	PO1 PO2
	b)	Define the terms: Time of flight and Trajectory in a projectile.	6 Marks	L1	CO2	PO1
		UNIT-IV				
7.	a)	Classify modes of heat transfer and explain them.	6 Marks	L2	CO2	PO1
	b)	Discuss the rectilinear motion of heat along a uniform bar.	6 Marks	L2	CO2	PO1
		(OR)				
8.	a)	Enumerate the thermal conductivity of poor conductor using Lee's disc method.	8 Marks	L2	CO2	PO1
	b)	Write the applications poor conductors.	4 Marks	L1	CO2	PO1

UNIT-V

9.	a)	Explain the preparation of metallic glasses by RF sputtering technique.	8 Marks	L2	CO3	PO1
	b)	Outline the application of metallic glasses.	4 Marks	L2	CO3	PO1
		(OR)				
10.	a)	What are shape memory alloys? Explain the characteristics of shape memory alloys. List the applications of shape memory alloys.	9 Marks	L2	CO3	PO1
	b)	List the application of composites.	3 Marks	L1	CO3	PO1

CODE No.: 19BT10201 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations, January 2022

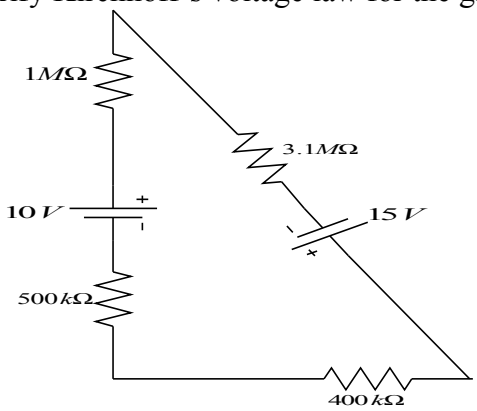
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	A sinusoidal voltage v = 50 sin **ωt** is applied to a series RL circuit. The current in the circuit is given by i = 25 sin (ωt -60º). Determine. i) apparent power ii) average power iii) reactive power and iv) power factor.	6 Marks	L2	CO1	PO1
	b)	With the help of neat sketch explain in detail the working of the single loop generator.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	State and verify Kirchhoff's voltage law for the given circuit. 	6 Marks	L3	CO1	PO2
	b)	Define RMS value and obtain the RMS and Average value of a sine wave having peak value of V_m and angular frequency **ω** rad/s.	6 Marks	L1	CO1	PO2

UNIT-II

3.	a)	Draw the typical layout of hydro power plant and explain its features.	6 Marks	L2	CO2	PO1
	b)	Summarize the necessity of earthing. With the help of neat sketch explain in detail the operation of pipe earthing.	6 Marks	L2	CO2	PO6
		(OR)				
4.	a)	With the help of neat sketch explain the operation of thermal power plant also mention its advantage and disadvantages.	6 Marks	L2	CO2	PO1
	b)	An industrial application demands high power factor. Suggest a suitable method to improve the low power factor.	6 Marks	L3	CO2	PO6

UNIT-III

5.	a)	Derive the expression for **e.m.f.** induced in a transformer in terms of frequency, maximum value of flux and number of turns on the windings.	6 Marks	L2	CO3	PO2
	b)	Derive the basic torque equation and explain the torque-slip characteristics of three phase induction motor.	6 Marks	L2	CO3	PO2

(OR)

6.	a)	Explain the constructional details of single phase capacitor start induction motor.	6 Marks	L2	CO3	PO1
	b)	Explain the constructional details of synchronous machine and mention it's applications.	6 Marks	L2	CO3	PO1

UNIT-IV

7.	a)	Explain the operation of a p-n junction diode in forward biased and reverse biased condition.	6 Marks	L1	CO4	PO1
	b)	Elucidate, how a Zener diode can be used as a voltage regulator.	6 Marks	L2	CO4	PO2

(OR)

8.		Draw the circuit of a half-wave-rectifier without filter and derive the expressions for ripple factor, % regulation, efficiency and PIV.	12 Marks	L1	CO4	PO1

UNIT-V

9.	a)	Construct an Adder using OP-AMP. Explain and analyze its operation.	6 Marks	L2	CO4	PO1
	b)	Comprehend the working of a comparator using op-amp. What are its limitations?	6 Marks	L2	CO4	PO1

(OR)

10.	a)	Examine and derive an expression for V_0 of the differentiator circuit by using op-amp.	6 Marks	L2	CO4	PO2
	b)	"OP-AMP can be used as an inverting amplifier". Explain.	6 Marks	L4	CO4	PO1

CODE No.: 19BT10501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations, January 2022

PROGRAMMING FOR PROBLEM SOLVING

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define flow chart, explain various symbols used in flowchart design.	6 Marks	L1	CO1	PO1
	b)	Illustrate membership and identity operators in Python with an example for each.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Design an algorithm to print first **n** fibonacci terms.	6 Marks	L3	CO1	PO2
	b)	Write a python script to perform swapping of two numbers without using third variable.	6 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Write the difference between **break** and **continue** statements with examples.	6 Marks	L2	CO1	PO1
	b)	Write a python program that takes an integer and forms a new integer which has the number of digits at the ten's place and the least significant digit in the one's place. For ex, 452 =>32.	6 Marks	L3	CO1	PO2
		(OR)				
4.	a)	Write a python program to check whether the given number (N) can be expressed as Power of Two (2) or not, for ex 8 can be expressed as 2^3.	6 Marks	L3	CO1	PO2
	b)	Display the following pattern using python script. ***** **** *** ** *	6 Marks	L3	CO1	PO2

UNIT-III

5.	a)	Write a python script to delete duplicate strings from a list of strings. (Insertion order should maintain after deleting duplicate string).	6 Marks	L3	CO1	PO3
	b)	Vamsi loves lucky numbers. Everybody knows that lucky numbers are positive integers whose decimal representation contains only the lucky digits 4 and 7. For example, numbers 47, 744, 4 are lucky and 5, 17, 467 are not. Write a python script to find whether the given number is Lucky or not.	6 Marks	L3	CO1	PO2
		(OR)				
6.	a)	Define queue. Write a python script to implement queue operations.	6 Marks	L3	CO1	PO3
	b)	Create a dictionary and display dictionary. Update any one key value and display the updated dictionary.	6 Marks	L3	CO1	PO2

UNIT-IV

7.	a)	Write a python script to count number of lines, words and characters present in a given file.	6 Marks	L3	CO2	PO3
	b)	Define recursion. Write a recursive function to calculate factorial of a given number.	6 Marks	L3	CO2	PO2
		(OR)				
8.	a)	Develop a python script to calculate GCD of given list of numbers.	6 Marks	L3	CO2	PO3
	b)	Explain functionality of the following properties. i) shape ii) ndim	6 Marks	L1	CO2	PO1

UNIT-V

9.	a)	Create a dictionary it contains student information, convert dictionary into pandas data frame.	6 Marks	L2	CO2	PO1
	b)	Consider data frame contains employee salary information. Write a python script to display employee details whose salary >30000.	6 Marks	L3	CO2	PO3
		(OR)				
10.	a)	Illustrate different ways of slicing operations used in selecting data from data frame.	6 Marks	L2	CO2	PO1
	b)	Draw bar plots by considering discrete data.	6 Marks	L3	CO2	PO3

CODE No.: 19BT20101 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations January – 2022

CIVIL ENGINEERING MATERIALS AND CONCRETE TECHNOLOGY

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Mention the factors to be considered while deciding a quarry site.	6 Marks	L2	CO1	PO1
	b)	What precautions are exercised in storing explosives? When is it required to quarry stones by blasting?	6 Marks	L4	CO1	PO1 PO2
		(OR)				
2.	a)	Explain the tests required to determine the suitability of bricks for construction works.	6 Marks	L3	CO1	PO1 PO2
	b)	Explain the process of burning bricks in Hoffman's kiln with a neat sketch.	6 Marks	L2	CO1	PO1 PO2 PO5

UNIT-II

3.	a)	Describe the cross section of a tree.	6 Marks	L4	CO1	PO1
	b)	List and explain the various methods of seasoning of timber.	6 Marks	L3	CO1	PO1 PO2 PO5
		(OR)				
4.	a)	Enumerate the precautionary measures to reduce various defects in timber.	6 Marks	L4	CO1	PO1 PO2
	b)	Explain in detail about alternative materials for wood.	6 Marks	L2	CO1	PO1 PO2 PO5

UNIT-III

5.	a)	Discuss the role of various major compounds of cement and its hydrated products in the properties of cement.	6 Marks	L2	CO1	PO1 PO2
	b)	Differentiate between accelerators and retarders with suitable examples and also how you can determine dosage of admixtures.	6 Marks	L4	CO1	PO1 PO2
		(OR)				
6.	a)	Briefly describe the following tests on aggregates: i) Crushing test. ii) Impact test.	6 Marks	L2	CO1	PO1
	b)	What are super plasticizers? How are these helpful in modifying the properties of concrete?	6 Marks	L4	CO1	PO1 PO2

UNIT-IV

7.	a)	What is meant by workability? How is it tested in field and in laboratory?	6 Marks	L3	CO1	PO1 PO2
	b)	Briefly explain about ready mix concrete.	6 Marks	L2	CO1	PO1
		(OR)				
8.	a)	Why compaction is required to concrete? Explain compaction methods by vibration.	6 Marks	L4	CO1	PO1 PO2
	b)	Mention various non-destructive testing of concrete. Explain any two methods in brief.	6 Marks	L3	CO1	PO1 PO2 PO5

UNIT-V

9.	a)	Write short note on: i) Creep. ii) Shrinkage of concrete.	6 Marks	L2	CO1	PO1
	b)	Explain how will you determine the modulus of elasticity of concrete experimentally.	6 Marks	L4	CO1	PO1 PO2
		(OR)				
10.		Design a concrete mix of M30 grade. Take standard deviation of 5Mpa.The specific gravities of coarse aggregate and fine aggregate are 2.75 and 2.62 respectively. The bulk density of coarse aggregate is 1610 kg/m³ and fineness modulus of aggregate is 2.70. A slump of 60 mm is necessary The water absorption of coarse aggregate is 1% and free moisture in fine aggregate is 2%. Design the concrete mix using IS code method. Assume any missing data.	12 Marks	L6	CO2	PO1 PO2 PO3 PO8

CODE No.: 19BT20102 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations January - 2022

ENGINEERING MECHANICS
[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain how the Parallelogram law can be used to obtain the resultant of more than two concurrent forces.	6 Marks	L4	CO1	PO1 PO2
	b)	What is a resultant force? What is meant by composition of forces, component of a force and resolution of a force? Can a force be resolved into non-perpendicular components? If so, how?	6 Marks	L4	CO1	PO1 PO2
		(OR)				
2.	a)	What is perfect frame and imperfect frame? Write the advantage of method of sections as compared to method of joints.	6 Marks	L4	CO1	PO1 PO2
	b)	Determine the forces in all the members of a truss shown in Fig.1 using method of joints.	6 Marks	L4	CO1	PO1 PO2

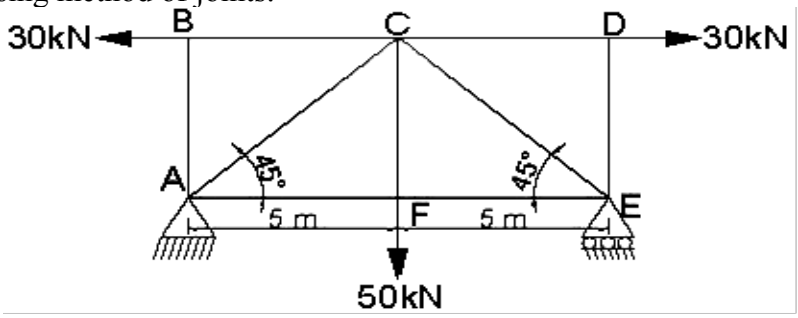


Fig.1

UNIT-II

3.		A block overlying a 100 wedge on a horizontal floor and leaning against a vertical wall and weighing 1500N is to be raised by applying a horizontal force to the wedge. Assuming the coefficient of friction to be 0.3, determine the minimum horizontal force to be applied to raise the block as shown in the Fig.2.	12 Marks	L4	CO1	PO1 PO2

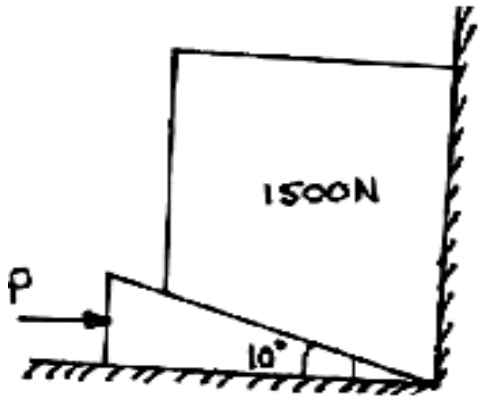


Fig.2

(OR)

4.	a)	Block A of weight 520N rest on the horizontal top of block B having weight 700N as shown in figure. Block A is tied to a support C by a cable at 30^0 to the horizontal. Coefficient of friction is 0.4 for all contact surfaces. Determine the minimum value of the horizontal force P just to move the block B. Find also the tension in the cable.	6 Marks	L4	CO1	PO1 PO2

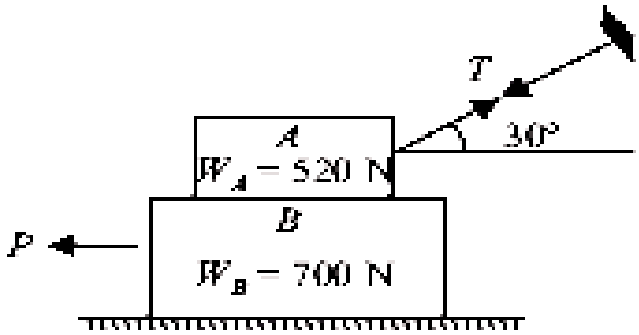


Fig.3

	b)	Two equal bodies A and B of weight `W' each are placed on a rough inclined plane. The bodies are connected by a light string. If μA = 1/2 and μB = 1/3, show that the bodies will be both on the point of motion when the plane is inclined at $\tan^{-1}$ (5/12).	6 Marks	L4	CO1	PO1 PO2

UNIT-III

5.		Find the area moment of inertia about the centroidal axes of the plane area shown in Fig.4. Also find the section modulus	12 Marks	L4	CO1	PO1 PO2

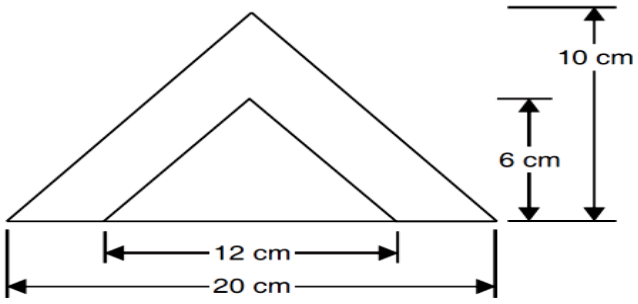


Fig.4

(OR)

6.		Find the area moment of inertia about the x and y axes of the plane area shown in Fig.5.	12 Marks	L4	CO1	PO1 PO2

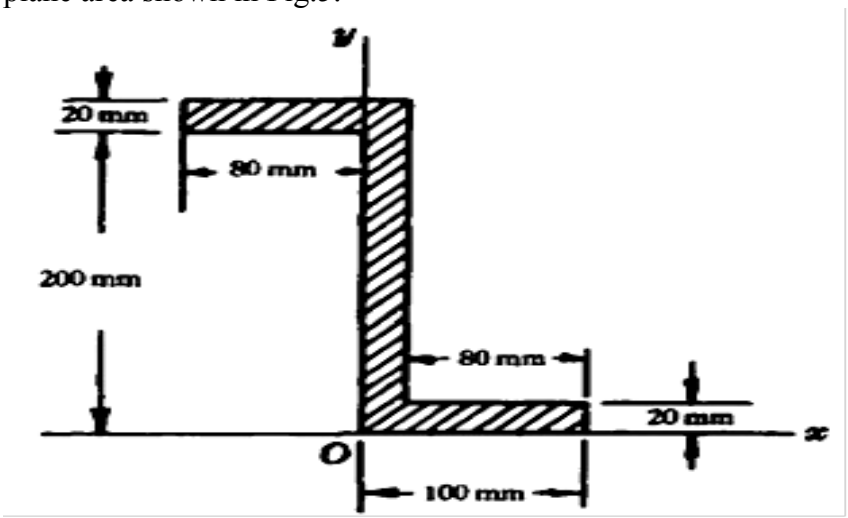


Fig.5

UNIT-IV

7.	a)	Derive the expression for the extension of the tapering rod with circular cross section.	6 Marks	L4	CO1	PO1 PO2
	b)	The following data refer to a mild steel specimen tested in a laboratory. Diameter of the specimen = 20 mm Length of the specimen = 250 mm Extension under a load of 10 kN = 0.035 mm Load at yield point = 120.15 kN Maximum load = 195.50 kN Length of the specimen under failure = 300 mm The neck diameter = 15.25 mm Determine Young's Modulus, Yield point, Ultimate stress, percentage of elongation and percentage reduction in area and safe stress adopting factor of safety of 2.	6 Marks	L4	CO1	PO1 PO2
		(OR)				
8.		Define resilience. Derive the maximum stress intensity on a member of length 'l' and uniform cross sectional area 'A' when a load of magnitude 'P' is applied gradually and suddenly on the member and identify the difference in these two cases.	12 Marks	L4	CO1	PO1 PO2

UNIT-V

9.	a)	Explain circumferential stress and longitudinal stress with neat sketch.	6 Marks	L4	CO1	PO1 PO2
	b)	Calculate the thickness of the metal required for a cast iron main 800 mm in diameter for water at a pressure head of 100 m if the maximum permissible tensile stress is 20 MN/m^2 and weight of water is 10 kN/m^3.	6 Marks	L6	CO2	PO1 PO2 PO3
		(OR)				
10.		A thick cylinder shell is of 300 mm internal diameter and has to withstand an internal pressure of 30MN/m^2. If permissible tensile stress of the shell is 150MN/m^2 and μ= 0.3, design the thickness of metal necessary for the cylinder on the basis of following criteria i) Maximum principal stress. ii) Maximum principal strain. iii) Maximum shear. iv) Maximum strain energy. Neglect the longitudinal direct stress.	12 Marks	L4	CO1	PO1 PO2

❀ ❀ ❀

CODE No.: 19BT20241 SVEC-19

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations January – 2022

NETWORK ANALYSIS

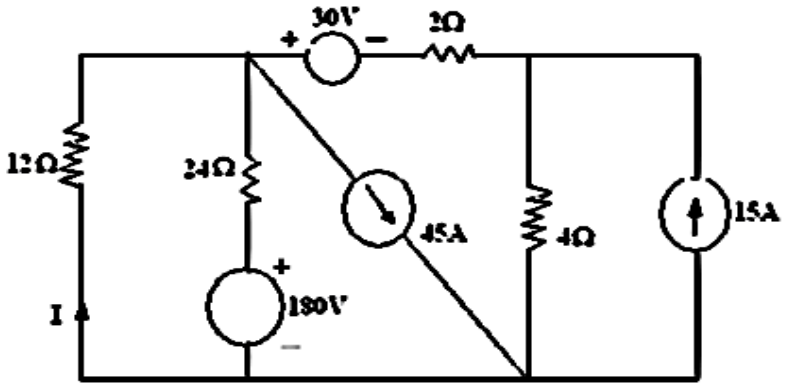
[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

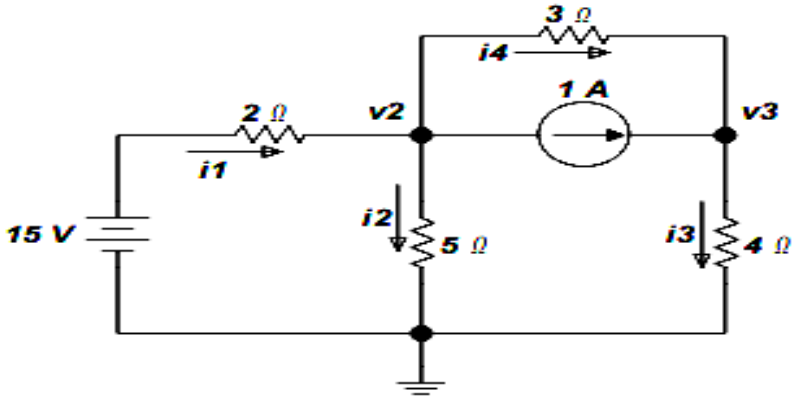
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Reduce the network shown in figure, to a single loop network by successive source transformation, and obtain current in the 12 Ω resistor.	6 Marks	L4	CO1	PO2

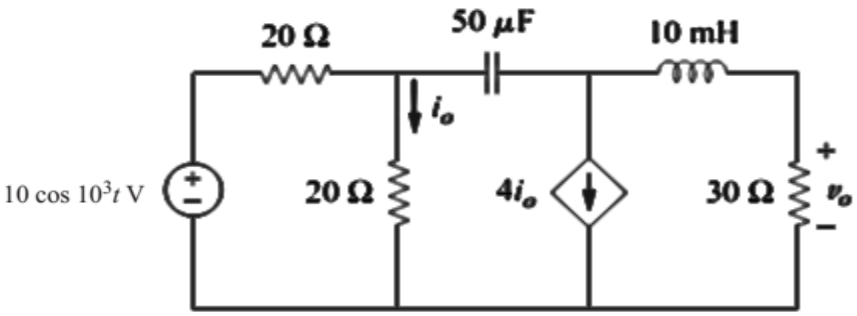


	b)	Obtain the current in the 4 Ω resistor of the circuit shown in figure.	6 Marks	L4	CO1	PO2

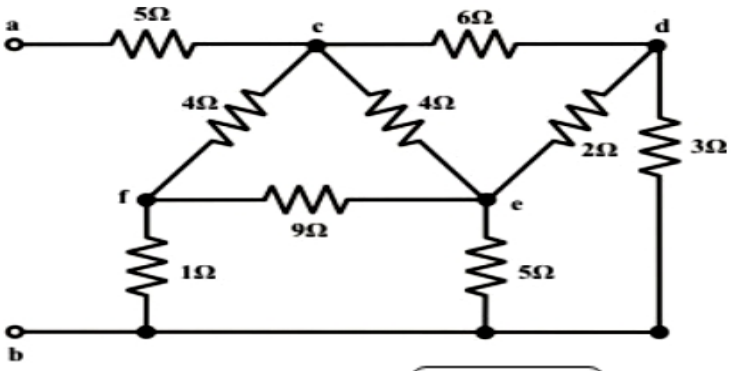


(OR)

2.	a)	Use nodal analysis to compute $v_0(t)$ of the circuit shown in figure.	6 Marks	L3	CO1	PO2



	b)	Find equivalent resistance between a and b terminals of the network shown in figure.	6 Marks	L4	CO1	PO2



UNIT-II

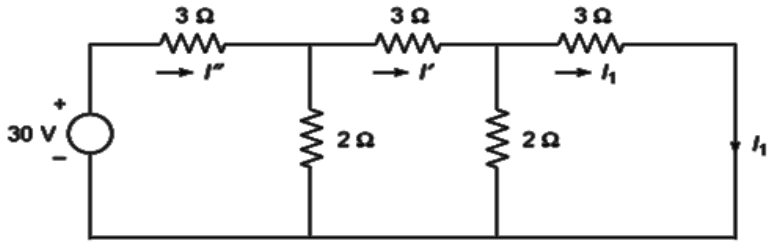
3.	a)	Derive bandwidth for a series RLC circuit as a function of resonant frequency.	6 Marks	L2	CO1	PO2
	b)	A series RLC circuit consists of resistance R = 20Ω, inductance, L=0.01H and capacitance, C = 0.04 μF. Calculate the frequency at resonance. If a 10 Volts ac voltage, with a frequency equal to the frequency of resonance is applied to this circuit, calculate the values of VC and VL across C and L respectively. Find the frequencies at which these voltages VC and VL are maximum?	6 Marks	L4	CO1	PO2

(OR)

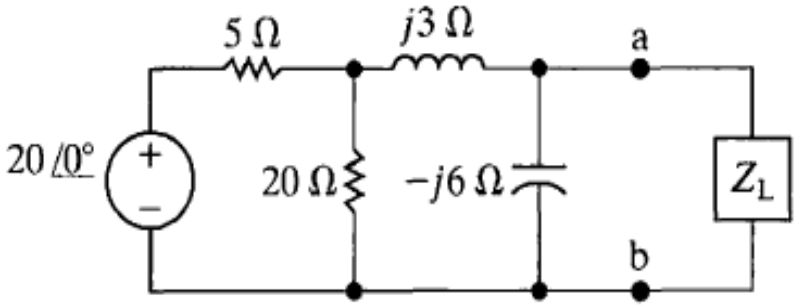
4.	a)	A series circuit consisting of a 10 Ω resistor, a 100 μF capacitance and a 10 mH inductance is driven by a 50 Hz AC voltage source with a max. value of 100 volts. Calculate the equivalent impedance, current in the circuit, the power factor and power dissipated in the circuit. Also, draw the vector diagram.	6 Marks	L4	CO1	PO2
	b)	Design a series R-L-C circuit that resonates at 1.5kHz and consumes 50 W from a 50 V A.C source operating at the resonance frequency. The bandwidth is 0.75 kHz.	6 Marks	L3	CO2	PO3

UNIT-III

5.	a)	Verify reciprocity theorem for the circuit shown in figure.	6 Marks	L3	CO1	PO2

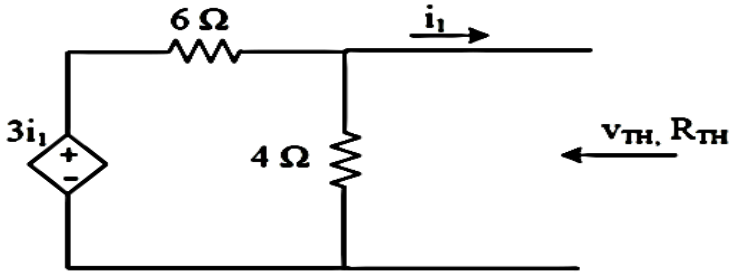


	b)	Determine the ZL of the circuit shown in figure, so that maximum power delivered to the load. Also find Pmax.	6 Marks	L3	CO1	PO2

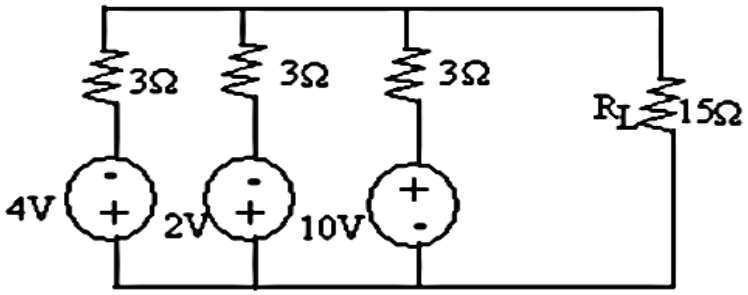


(OR)

6.	a)	Find V_{TH}, R_{TH} of circuit shown in figure.	6 Marks	L4	CO1	PO2

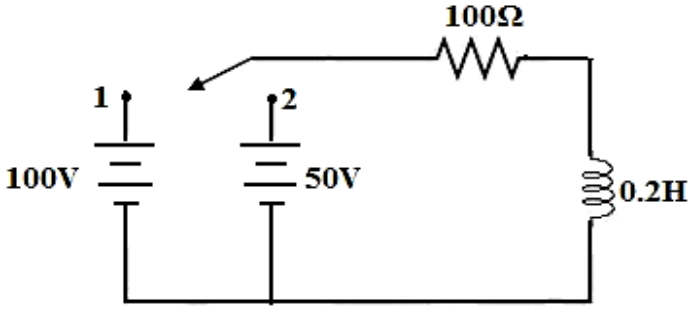


	b)	Using Millman's theorem, find the current through 15 Ω resistor the circuit shown in figure.	6 Marks	L3	CO1	PO5



UNIT-IV

7.	a)	Derive the transient response of series R-L-C circuit, with DC excitation using Laplace transform obtain the response for a different damped cases.	4 Marks	L2	CO1	PO2
	b)	In the circuit shown in figure, the switch is closed on position i) at t=0 there by applying the 100 V source to the R-L branch, and at t=500 micro seconds, the switch is moved to position ii) Obtain the equations for the current in both intervals using Laplace transforms approach.	8 Marks	L4	CO1	PO2



(OR)

8.	a)	Derive the expression for transient current of series RC circuit with AC excitation and sketch the transient response.	6 Marks	L2	CO1	PO2
	b)	In designing a signal switching circuit, it was found that a 100 μF capacitor was needed for a time constant of 3 ms. What value resistor is necessary for the circuit?	6 Marks	L4	CO2	PO6

UNIT-V

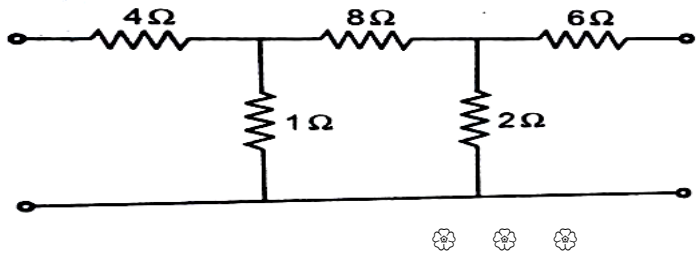
9.	a)	Express h parameters in terms of ABCD parameters for a generalized network.	6 Marks	L2	CO1	PO1
	b)	Z-parameters for a two port network are given as Z_{11}=25, Z_{12}=Z_{21}=20, Z_{22}=50. Design an equivalent T-network.	6 Marks	L4	CO2	PO3

(OR)

10	a)	Prove that reciprocity condition for impedance parameters is	6 Marks	L2	CO1	PO2

. $Z_{12}=Z_{21}$, symmetry condition is $Z_{11}=Z_{22}$

b) Determine the ABCD parameters of the given network shown in figure. 6 Marks L4 CO1 PO2



CODE No.: 19BT20301 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations January – 2022

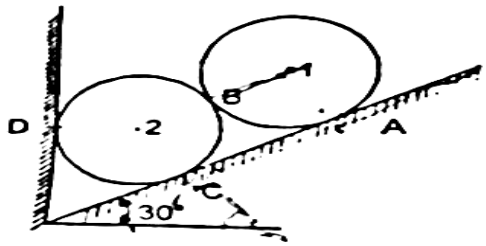
BASIC ENGINEERING MECHANICS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

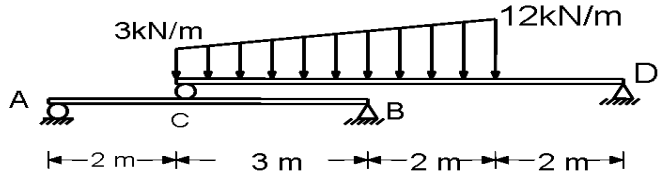
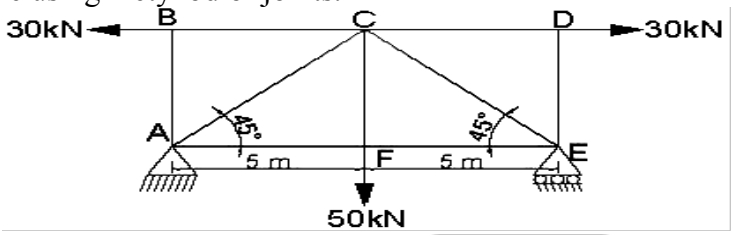
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	Two identical rollers each weighing 100N are supported by an inclined plane and a vertical wall as showing figure. Assuming smooth surfaces, find the reactions induced at the points of supports A,B,C and D. 	12 Marks	L2	CO1	PO1 PO2
	(OR)				
2.	Three cylinders are piled in a rectangular ditch as shown in figure. Neglecting friction determine the reaction between cylinder A and the vertical wall. Weights and radii of the cylinders are as given below.	12 Marks	L2	CO1	PO1 PO2

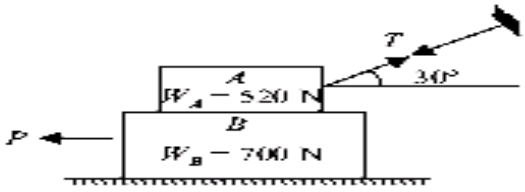
Cylinder	Radius	Weight
A	100mm	75N
B	150mm	200N
C	125mm	100N

UNIT-II

3.	Calculate reactions at A, B, C and D as shown in the given figure. 	12 Marks	L2	CO1	PO1 PO2
	(OR)				
4.	Determine the forces in all the members of a truss shown in figure using metyhod of joints. 	12 Marks	L2	CO1	PO1 PO2

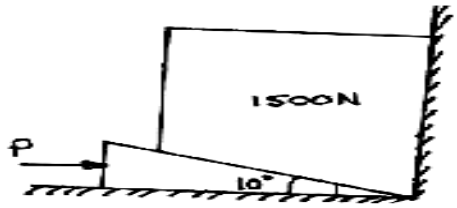
UNIT-III

5.	Block A of weight 520N rest on the horizontal top of block B having weight 700N as shown in figure. Block A is tied to a support C by a cable at 300 to the horizontal. Coefficient of friction is 0.4 for all contact surfaces. Determine the minimum value of the horizontal force P just to move the block B. Find also the tension in the cable.	12 Marks	L2	CO1	PO1 PO2



(OR)

6.		A block overlying a 100 wedge on a horizontal floor and leaning against a vertical wall and weighing 1500N is to be raised by applying a horizontal force to the wedge. Assuming the coefficient of friction to be 0.3, determine the minimum horizontal force to be applied to raise the block. As shown in the figure.	12 Marks	L2	CO1	PO1 PO2

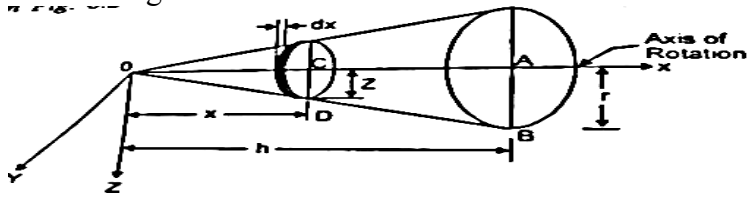


UNIT-IV

7.	a)	Brief about Axis of revolution and axis of symmetry.	6 Marks	L2	CO2	PO1
	b)	Derive the expressions to find centroid of a composite plane figure.	6 Marks	L2	CO2	PO1

(OR)

8.		Determine the mass moment of inertia of the right circular cone as shown in figure.	12 Marks	L3	CO2	PO1 PO2



UNIT-V

9.	a)	Derive the relation between angular velocity and linear velocity.	6 Marks	L2	CO3	PO1
	b)	A Body Weighing 196.2 N slides up a 60 degrees inclined plane under the action of applied force 400N acting parallel to the inclined plane. The coefficient of friction is equal to 0.2. The body moves from rest. Determine: i) Acceleration of the body. ii) Distance travelled by the body in 5 sec. iii) Work done by the body in 5 seconds.	6 Marks	L2	CO3	PO1 PO2

(OR)

10.	a)	Derive the equation for Time period of oscillation for the springs of stiffness's K_1 and K_2 which are connected in series and parallel	6 Marks	L2	CO4	PO1
	b)	A Weight of 50 N is suspended from a spring, vibrates vertically with a frequency of 1 Hertz and amplitude of 7.5 cm. Find the stiffness of spring and maximum velocity.	6 Marks	L2	CO4	PO1 PO2

❀ ❀ ❀

CODE No.: 19BT20302 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations January - 2022

MATERIAL SCIENCE AND ENGINEERING

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Discuss briefly the following structures for metallic elements: i) Body centered cubic. ii) Face centered cubic. iii) Hexagon close-packed.	6 Marks	L1	CO1	PO1
	b)	Demonstrate the Edge and Screw dislocations with neat sketches.	6 Marks	L3	CO1	PO1
		(OR)				
2.	a)	Draw Fe-Fe_3C phase diagram and explain the phase transformation reactions in the diagram.	8 Marks	L3	CO1	PO2
	b)	State Gibb's Phase rule. What is its importance?	4 Marks	L1	CO1	PO4
		UNIT-II				
3.	a)	Define annealing. Differentiate between full annealing and process annealing.	6 Marks	L1	CO1	PO1 PO7
	b)	Classify the various types of hardening treatments. Explain flame and induction hardening treatment.	6 Marks	L2	CO1	PO2 PO7
		(OR)				
4.	a)	Explain Time Temperature Transformation (TTT) diagram for eutectoid steel.	6 Marks	L2	CO1	PO2
	b)	"Carburizing heat treatment is generally done on low carbon steels". Why?	6 Marks	L3	CO1	PO3
		UNIT-III				
5.	a)	List the properties and applications of Hadfield manganese, Stainless and Tool steels.	6 Marks	L1	CO2	PO1
	b)	Draw the micro structure of plain carbon steels and write the applications of it.	6 Marks	L3	CO2	PO4
		(OR)				
6.	a)	What are different types of cast irons? Draw the micro structure of any two types of cast irons. Give composition and applications of each.	6 Marks	L4	CO2	PO2
	b)	Interpret the effect of alloying elements on properties of cast iron.	6 Marks	L2	CO2	PO3
		UNIT-IV				
7.	a)	State and describe some of the important properties of nonferrous metals and alloys.	6 Marks	L1	CO2	PO1
	b)	Differentiate between brasses and bronzes in view of properties and applications.	6 Marks	L2	CO2	PO3
		(OR)				
8.	a)	Explain the composition, properties and uses of Titanium alloys.	6 Marks	L2	CO2	PO1
	b)	Write short notes on refractory and precious metals.	6 Marks	L1	CO2	PO1
		UNIT-V				
9.	a)	What are ceramics? How ceramics are classified? Write the advantages and applications of ceramics.	6 Marks	L1	CO2	PO2
	b)	Write short notes on processing and recycling of polymers.	6 Marks	L1	CO2	PO1
		(OR)				
10.	a)	Briefly explain various properties and applications of Fiber reinforced composites.	6 Marks	L2	CO2	PO1
	b)	What is polymerization? Explain addition polymerization and condensation polymerization.	6 Marks	L1	CO2	PO1

CODE No.: 19BT20501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations January – 2022

DIGITAL LOGIC DESIGN

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Convert the following numbers with the indicated bases to decimal: i) $(4310)_5$ ii) $(198)_{12}$	6 Marks	L3	CO1	PO1
	b)	Explain any five properties of Boolean Algebra with example.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Simplify the following Boolean expressions to a minimum number of literals: i) $xy + x(wz+wz')$. ii) $xy' + y'z' + x'z'$.	6 Marks	L3	CO1	PO2
	b)	Compute dual of the following Boolean expressions. i) $AB+A(B+C)+B'(B+D)$. ii) $A+B+A'B'C$.	6 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Simply the following Boolean Function using four-variable k-maps. $F A, B, C, D) = \Sigma (2,3,6,7,12,13,14)$	6 Marks	L4	CO1	PO2
	b)	Draw the logic diagram for the Boolean expression using AND, OR gates. $F = x (y'+ z) (x' + y + z')$	6 Marks	L4	CO1	PO3
		(OR)				
4.	a)	Obtain the truth table for the following functions and express each function in sum of minterms and product of max terms: i) $(xy + z) (y + xz)$ ii) $(A'+ B) (B'+ C)$ iii) $y'z+wxy'+wxz'+w'x'z$	6 Marks	L4	CO1	PO2
	b)	Minimize the expression using K-map and realize using only NAND gates. $F (A, B, C, D) = \sum (0, 1, 2, 9, 11)$ and don't care conditions $d (A, B, C, D) = (8, 10, 14, 15)$	6 Marks	L4	CO1	PO3

UNIT-III

5.	a)	Design a combinational circuit with four inputs and four outputs. The output generates the 2's complement of the input binary number.	6 Marks	L4	CO2	PO4
	b)	Define Multiplexer. Implement the following Boolean function using a suitable Multiplexer. F(A,B,C,D)=∑(0,1,3,4,8,9,15)	6 Marks	L4	CO2	PO5
		(OR)				
6.	a)	Design a 4-bit Magnitude comparator.	8 Marks	L4	CO2	PO3
	b)	Describe the function of an encoder and list its applications.	4 Marks	L2	CO2	PO1

UNIT-IV

7.	a)	Explain the circuit diagram of a S-R flip-flop using 2-input NOR gates.	6 Marks	L2	CO2	PO1
	b)	Draw a 3-bit parallel load register. Use D flip flops and explain its operation.	6 Marks	L2	CO2	PO1
		(OR)				
8.	a)	Design a 4-bit ripple counter using T flip-flops.	6 Marks	L4	CO2	PO3
	b)	Draw and explain 4-bit shift register with an example.	6 Marks	L2	CO2	PO1

UNIT-V

9.		Implement the following two Boolean functions with a PLA: $F_1(A, B, C) = \Sigma m(0, 1, 2, 4)$; $F_2(A, B, C) = \Sigma m(0, 5, 6, 7)$.	12 Marks	L4	CO2	PO4
		(OR)				
10.	a)	Explain in detail the addressing scheme of 1K x 16 memory with the help of a neat diagram.	9 Marks	L2	CO2	PO2
	b)	Compare SRAM and DRAM memories.	3 Marks	L4	CO2	PO2

CODE No.: 19BT21501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations January - 2022

OBJECT ORIENTED PROGRAMMING THROUGH JAVA
[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	What is a class? Explain the syntax for declaring a class with an example.	6 Marks	L1	CO1	PO1
	b)	Explain the following : i) Byte code. ii) This keyword.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Write about any two non-access modifiers in Java.	4 Marks	L1	CO1	PO1
	b)	Construct a class Rectangle. The class has two attributes, length and width, each of which defaults to 0. It has methods that calculate the perimeter and area of the rectangle. It has set and get methods for both length and width. The set methods should verify that length and width are floating – point numbers larger than 0.0 and less than 20.0.	8 Marks	L3	CO1	PO3
		UNIT-II				
3.	a)	List categories of operators supported by JAVA.	4 Marks	L1	CO1	PO1
	b)	What is an array? Explain different ways of creating an array.	8 Marks	L1	CO1	PO1
		(OR)				
4.	a)	Write about wrapping and unwrapping.	6 Marks	L1	CO1	PO1
	b)	Classify different data types in Java.	6 Marks	L2	CO1	PO2
		UNIT-III				
5.	a)	Write a program to create an abstract class named Shape that contains an empty method named number of Sides ( ). Provide three classes named Trapezoid, Triangle and Hexagon such that each one of the classes extends the class Shape. Each one of the classes contains only the method number Of Sides ( ) that shows the number of sides in the given geometrical figures.	6 Marks	L2	CO2	PO2
	b)	Design a java program to demonstrate the concept of multithreading using Reader's-Writer's Problem.	6 Marks	L2	CO2	PO2
		(OR)				
6.	a)	Distinguish between class, abstract class and interfaces.	6 Marks	L2	CO2	PO2
	b)	With an example program, explain the usage of final keyword in inheritance.	6 Marks	L2	CO2	PO2
		UNIT-IV				
7.	a)	What is a package? Explain with a suitable example.	8 Marks	L1	CO2	PO1
	b)	Explain about Daemon Threads in Java.	4 Marks	L2	CO2	PO4
		(OR)				

8.	a)	Develop a java program to read 20 marks and store them in an array. Define your own exception named wrong mark exception. Throw and catch this type of exception when a mark is (<0 and >100).	6 Marks	L3	CO2	PO3
	b)	Write a program to create a class "Book" with name, id, author, publisher and quantity as instance variables and a constructor to initialize them. Create a Hash Set object of type Book and three Book instances b_1, b_2 and b_3. Add these instances into Hash Set and display them.	6 Marks	L2	CO2	PO2

UNIT-V

9.		Develop a program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw a Number Format Exception. If Num2 were Zero, the program would throw an Arithmetic Exception Display the exception in a message dialog box.	12 Marks	L3	CO3	PO5

(OR)

10.	a)	What is an Event? Discuss about Window Event and Mouse Event.	6 Marks	L2	CO3	PO2
	b)	Explain about any three AWT Components.	6 Marks	L2	CO3	PO2

CODE No.: 19BT1BS02 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations June - 2022

BIOLOGY FOR ENGINEERS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		Define cell. Explain the differences between eukaryotes and prokaryotic organisms with neat labeled diagrams.	12 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Summarize the classification of living organisms and non living organisms based on the energy sources and carbon.	6 Marks	L2	CO1	PO1
	b)	Illustrate the classification of molecular taxonomy.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Define fermentation. Explain various examples of fermented products used in our day to day life.	6 Marks	L1	CO1	PO1
	b)	Define nucleic acids. Explain various types of nucleic acids and their structure.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Explain different types of enzymes and their applications.	6 Marks	L1	CO1	PO1
	b)	Brief about the structure and function of proteins.	6 Marks	L2	CO3	PO6
		UNIT-III				
5.	a)	Define genetics. Explain the Mendel's laws of independent assortment.	8 Marks	L2	CO1	PO1
	b)	Explain advantages and disadvantages of the universality of the genetic code to humans.	4 Marks	L2	CO2	PO1
		(OR)				
6.		Define DNA replication process. Compare the processes of DNA replication and transcription.	12 Marks	L2	CO3	PO6
		UNIT-IV				
7.	a)	Explain r-DNA technology.	8 Marks	L1	CO1	PO1
	b)	Define transgenic organisms. Explain transgenic animals with some examples.	4 Marks	L2	CO2	PO1
		(OR)				
8.	a)	Summarize the gene therapy and its applications.	6 Marks	L2	CO2	PO1
	b)	Explain the steps involved in cloning of DNA fragments.	6 Marks	L2	CO2	PO1
		UNIT-V				
9.		Explain the stages of action potential with a neat labeled diagram.	12 Marks	L2	CO1	PO1
		(OR)				
10.	a)	Define gene. Explain how gene and genome are related.	6 Marks	L2	CO3	PO6
	b)	Explain the differences between ECG and EEG.	6 Marks	L1	CO1	PO1

CODE No.: 19BT1BS03 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations June - 2022

ENGINEERING PHYSICS
[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the formation of Newton' rings. Determine the wavelength of sodium lightusing Newton's rings experiment.	8 Marks	L3	CO1	PO2
	b)	Newton's rings are observed in the reflected light of wavelength 5700 Aº. The diameter of tenth dark ring is 4 cm. Find the radius of curvature of the lens used.	4 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Discuss the Fraunhoffer diffraction. Deduce the conditions for maxima and minima for diffraction at a single slit.	8 Marks	L2	CO1	PO1
	b)	Write short notes on Nicol' prism.	4 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Explain divergence and curl of electric and magnetic fields.	6 Marks	L2	CO2	PO1
	b)	Write the four Maxwell's equations and explain their physical significance.	6 Marks	L3	CO2	PO2
		(OR)				
4.	a)	Classify the optical fibers on the basis of refractive index profile and on the basis modes with neat diagrams.	8 Marks	L2	CO2	PO1
	b)	A fiber Cable has an acceptance angle 30º and a core refractive index of 1.6. Calculate the refractive index of Cladding.	4 Marks	L3	CO2	PO2
		UNIT-III				
5.	a)	Derive an expression for density of electrons in an intrinsic semiconductor.	6 Marks	L3	CO3	PO2
	b)	Explain intrinsic carrier concentration and how it is varying temperature.	6 Marks	L2	CO3	PO1
		(OR)				
6.	a)	What is drift current? Derive an expression for drift current density and diffusion current density.	8 Marks	L3	CO3	PO2
	b)	Explain the working of photo diode.	4 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	Define dielectric polarization.	2 Marks	L1	CO4	PO1
	b)	Derive an expression for Lorentz field in a dielectric material with neat diagram.	10 Marks	L2	CO4	PO2
		(OR)				
8.	a)	Distinguish different types of magnetic materials.	6 Marks	L4	CO4	PO1
	b)	What is Hysteresis and construct B-H curve for a ferromagnetic material.	6 Marks	L3	CO4	PO2

UNIT-V

9.	a)	What is superconductivity? Distinguish Type-I and Type-II superconductors.	6 Marks	L4	CO5	PO1
	b)	Explain how BCS theory supports superconductivity in detail.	6 Marks	L2	CO5	PO1
		(OR)				
10.	a)	What is nanoscience? Why the properties of nanomaterials are different from the properties of bulk material?	6 Marks	L1	CO5	PO1
	b)	Write applications of nanomaterials in different fields.	6 Marks	L1	CO5	PO1

CODE No.: 19BT1BS04 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations June - 2022

ENGINEERING CHEMISTRY

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain Quantum mechanical model of Hydrogen atom.	7 Marks	L2	CO1	PO1 PO2
	b)	Explain π-molecular orbital's of butadiene.	5 Marks	L2	CO1	PO1 PO2
		(OR)				
2.	a)	The energies of a particle in a one dimensional box are quantized. Justify?	7 Marks	L2	CO1	PO1 PO2
	b)	Discuss the bonding in homo nuclear diatomic molecule O_2.	5 Marks	L2	CO1	PO1 PO2

UNIT-II

3.		Explain how Fluoride content in the water will effect on human health and discuss how to remove fluoride content from water by Nalgonda technique.	12 Marks	L2	CO2	PO1 PO6
		(OR)				
4.	a)	100 mL of Tirupati water sample consumed 22 mL of 0.01 M EDTA solution on titration by complexometry. The same water sample (100mL) after TREATMENT consumed 5 mL of 0.01 M EDTA solution. Identify and explain the external treatment with neat diagram by calculating hardness and residual hardness. [Hint: 1 ml 0.01 M EDTA = 1 ml 0.01 M $CaCO_3$].	8 Marks	L3	CO2	PO1 PO6
	b)	Discuss briefly any two internal conditioning methods.	4 Marks	L2	CO2	PO1

UNIT-III

5.	a)	Draw a fully labelled diagram showing how you could measure the E^0 value for the Cu^{2+}/Cu system using a standard hydrogen electrode. Your diagram should show all the essential conditions for the experiment. (The Cu^{2+}/Cu system means having Copper metal in contact with Cu^{2+}ions.).	7 Marks	L3	CO3	PO1 PO2
	b)	Illustrate with the aid of label diagrams that show how a DC Electrical power supply could be used to prevent or at least decrease the extent of corrosion of a steel underground pipeline used for carrying gases.	5 Marks	L3	CO3	PO1 PO2
		(OR)				
6.	a)	Discuss the discharging and charging process of Li-ion battery with neat diagram and chemical Reactions.	7 Marks	L2	CO3	PO1 PO2
	b)	Identify and explain in detail mechanism of the possible type of corrosion that Iron screw metal will undergo in the pictured environment.	5 Marks	L2	CO3	PO1 PO2

UNIT-IV

7.		Discuss the principle and working of UV-Visible Spectrotometer with the help of a block diagram.	12 Marks	L2	CO4	PO1 PO5
		(OR)				
8.		Discuss the principle and applications of TEM and XRD.	12 Marks	L2	CO4	PO1 PO5

UNIT-V

9.		Write a note on: i) Knocking agents. ii) Anti Knocking agents. iii) Octane number. iv) Cetane number.	12 Marks	L2	CO5	PO1 PO2
		(OR)				
10.	a)	Discuss the classification of fuels with suitable examples	7 Marks	L2	CO5	PO2
	b)	Define lubricant. Discuss any two properties of lubricants.	5 Marks	L3	CO5	PO1 PO2

CODE No.: 19BT2BS01 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations June - 2022

TRANSFORMATION TECHNIQUES AND LINEAR ALGEBRA

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Classify the function f(x) = Sinx + Cosx +x^3 Sinhx as even, odd or neither.	4 Marks	L4	CO1	PO2
	b)	Obtain the Fourier series of the function f(x) =x^2, $-\pi \le x \le \pi$ hence deduce that $\frac{\pi^2}{6} = \frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + ...$	8 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Express f(x) = e^{-x} + e^{-2x}, x > 0 as a Fourier cosine integral.	4 Marks	L1	CO1	PO1
	b)	Find Fourier transform of $f(x) = \begin{cases} a - \lvert x \rvert & for \ \lvert x \rvert \le a \\ 0 & for \lvert x \rvert > a > 0 \end{cases}$	8 Marks	L1	CO1	PO1

UNIT-II

3.	a)	Evaluate $\int_0^\infty \frac{e^{-at} - e^{-bt}}{t} dt$ using Laplace transform.	6 Marks	L3	CO1	PO2
	b)	Define unit impulse function and find its Laplace transform.	6 Marks	L1	CO1	PO1
		(OR)				
4.	a)	Express the function $f(t) = \begin{cases} E, & a < t < b \\ 0, & t \ge b \end{cases}$ in terms of unit step function and hence find its Laplace transform.	6 Marks	L3	CO1	PO2
	b)	Find $L\ (t^2 e^t\ Si4t)$.	6 Marks	L1	CO1	PO1

UNIT-III

5.	a)	Solve y^{11}+ y = t, y^1 (0) = 1, y(π) = 0, by Laplace transforms.	8 Marks	L3	CO1	PO2
	b)	Find inverse Laplace transform of $\cot^{-1}\left(\frac{s}{2}\right)$.	4 Marks	L3	CO1	PO2
		(OR)				
6.	a)	Using convolution theorem find $L^{-1}\left(\frac{s}{(s^2+1)(s^2+4)}\right)$.	8 Marks	L1	CO1	PO1
	b)	Solve y^{11} + y = 0, y^1 (0) = -1, y(0) = 1, by Laplace transform method.	4 Marks	L1	CO1	PO1

UNIT-IV

7.		Find a real symmetric matrix of the following quadratic form $Q = x^2 + 3y^2 + 2z^2 + 2xy + 6yz$. Find the index and signature of Q.	12 Marks	L4	CO2	PO2

(OR)

8.		Find the eigen values and eigen vectors of the matrix. $\begin{bmatrix} -9 & 2 & 6 \\ 5 & 0 & -3 \\ -16 & 4 & 11 \end{bmatrix}$	12 Marks	L3	CO2	PO2

UNIT-V

9.	a)	Find a linear mapping $F: R^3 \to R^3$ whose image is generated by (1, 2, 3) and (4, 5, 6).	8 Marks	L3	CO2	PO2
	b)	State whether or not the following vectors in R^3 are linearly dependent. i) (1, -3, 7), (2, 0, -6), (3, -1, -1), (2, 4, -5). ii) (2, -3, 7), (0, 0, 0), (3, -1, -4).	4 Marks	L1	CO2	PO1

(OR)

10.	a)	Determine whether or not (1, 1, 2), (1, 2, 5) and (5, 3, 4) form a basis for the vector space R^3	8 Marks	L2	CO2	PO1
	b)	Show that the mapping $F: R^2 \to R^2$ defined by $F(x, y) = (x + y, x)$ is linear.	4 Marks	L1	CO2	PO1

CODE No.: 19BT10201 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations June – 2022

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

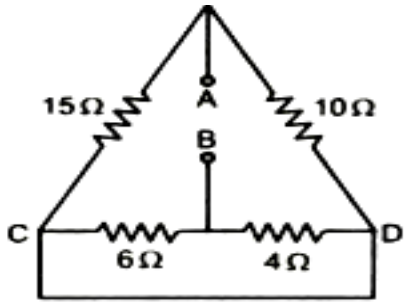
[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the generation of A.C Voltage using a single loop generator with a neat sketch.	8 Marks	L2	CO1	PO1
	b)	Determine the effective resistance between the terminals A & B.	4 Marks	L3	CO1	PO2



(OR)

2.	a)	Define real power, reactive power and apparent power. Give the relation between them with the help of a power triangle.	6 Marks	L2	CO1	PO2
	b)	A series circuit having a resistance of 10Ω, an inductance of 0.25H and capacitance is connected across a 100V, 50 Hz supply. If the circuit takes a current of 8A. Calculate: i) Impedance. ii) Capacitance. iii) Power factor.	6 Marks	L3	CO1	PO2

UNIT-II

3.	a)	With a neat sketch, explain the operation of Thermal power plant.	6 Marks	L2	CO2	PO1
	b)	Discuss the basic operation of UPS with the help of a block diagram.	6 Marks	L2	CO2	PO7

(OR)

4.	a)	Sketch the typical layout and explain the operation of a Solar power plant	6 Marks	L2	CO2	PO1
	b)	What is the importance Earthing? Explain the pipe earthing with a neat diagram.	6 Marks	L1	CO2	PO1

UNIT-III

5.	a)	Briefly explain the constructional features of a 1-phase static device, which transforms one level of energy to other level of energy.	6 Marks	L2	CO3	PO6
	b)	Derive the torque equation and draw the slip-torque characteristics for a three-phase induction motor.	6 Marks	L2	CO3	PO1

(OR)

6.	a)	With a neat sketch, describe the construction and working of capacitor start and run single phase induction motor.	6 Marks	L2	CO3	PO1
	b)	Briefly explain the principle of operation and characteristics of a synchronous machine when acting as a motor.	6 Marks	L2	CO3	PO1

UNIT-IV

7.		Draw the Full wave Rectifier with necessary graphs and derive expression for its efficiency, ripple factor, TUF.	12 Marks	L2	CO4	PO1
		(OR)				
8.	a)	Explain the operation of P-N junction diode and derive the expression for diode equation.	6 Marks	L2	CO4	PO2
	b)	Describe the CC configuration of BJT and its input and output characteristics briefly.	6 Marks	L2	CO4	PO4

UNIT-V

9.	a)	Explain how an op-amp can be used as a non-inverting adder with a neat circuit diagram.	6 Marks	L3	CO4	PO2
	b)	Describe how an op-amp can be used as a comparator with a neat circuit diagram.	6 Marks	L3	CO4	PO2
		(OR)				
10.	a)	Discuss the comparisons of op-amp with respect to AC and DC characteristics.	6 Marks	L3	CO4	PO2
	b)	Draw the circuit diagram of basic Integrator using op-amp and explain its operation.	6 Marks	L4	CO4	PO2

CODE No.: 19BT10501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations June - 2022

PROGRAMMING FOR PROBLEM SOLVING

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Describe the top-down design process in problem solving methods with an example.	6 Marks	L2	CO1	PO1
	b)	Illustrate the role play of different data types supported by python with proper syntax and explain its significance. Write a Python script to convert a given number (in days) to years, months and days, assumes that all months have 30 days and a year have 365 days.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	What are the building blocks of flowchart? Draw the flowchart for finding the greatest common divisor of given two numbers.	6 Marks	L2	CO1	PO1
	b)	Explain about relational operator, assignment operator and membership operators with examples.	6 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Explain various iteration statements with flowchart and example.	6 Marks	L2	CO1	PO1
	b)	Write a python script to perform mathematical operation as menu driven application.	6 Marks	L3	CO2	PO2
		(OR)				
4.	a)	Read 10 students ages, count the number of students who are having eligibility to vote.	6 Marks	L3	CO2	PO2
	b)	Write a python script to convert given decimal number into Hexadecimal and binary format.	6 Marks	L3	CO2	PO2

UNIT-III

5.	a)	Define List. Explain different operations we can perform on the list with an example.	6 Marks	L2	CO1	PO1
	b)	Write a python Script to implement Stack Operations.	6 Marks	L3	CO2	PO2
		(OR)				
6.	a)	Explain different String Operations and String Methods with example.	6 Marks	L2	CO1	PO1
	b)	What is a Dictionary? Explain accessing, updating and deleting elements in a dictionary with suitable examples.	6 Marks	L2	CO1	PO1

UNIT-IV

7.	a)	List and explain the properties and functions in math, Date and Time.	6 Marks	L2	CO2	PO1
	b)	Write a Python script to copy the content of one file into another file.	6 Marks	L3	CO2	PO2
		(OR)				
8.	a)	Define user defined function *IsPresemt()*, which accepts two parameters first one is a list which contains the roll numbers of the students who are attended for exam and second one Ron of the student. Check whether the given rno is attended for exam or not.	6 Marks	L3	CO2	PO2

	b)	Write short notes on numpy functions.	6 Marks	L1	CO2	PO2

UNIT-V

9.	a)	Consider data frame contains list of employee salary per month. Write a Python Script to display whose employee salary greater than Five Lakh per Annum.	6 Marks	L3	CO2	PO3
	b)	Explain different steps involved to draw a Scatter Plot in python with an example.	6 Marks	L2	CO2	PO2

(OR)

10.	a)	Write a python script to load data from a CSV file into a Data Frame and perform basic operations on it.	6 Marks	L3	CO2	PO3
	b)	Explain the steps involved to Plot a Histogram in Python with an example.	6 Marks	L2	CO2	PO2

CODE No.: 19BT20102 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations June - 2022

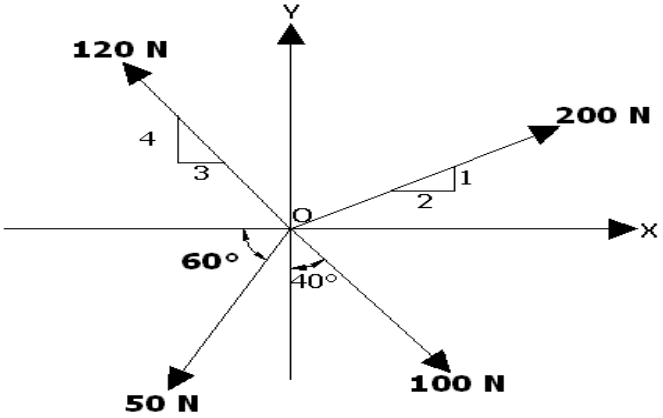
ENGINEERING MECHANICS
[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

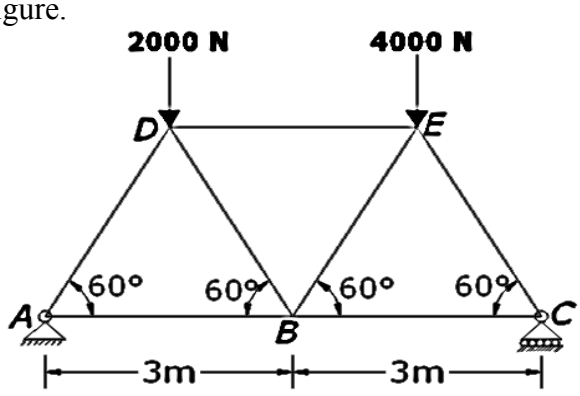
UNIT-I

1.	a)	Define moment of force about a point and show that the algebraic sum of the moments of two coplanar forces about a point is equal to the moment of their resultant about that point.	6 Marks	L4	CO1	PO1 PO2
	b)	A system of four forces acting on a body is shown in figure. Determine the resultant force and its direction.	6 Marks	L4	CO1	PO1 PO2



(OR)

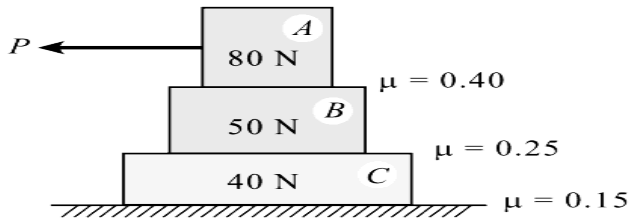
2.	a)	Explain how you will reduce the system of coplanar, non-concurrent forces to a force and a couple.	6 Marks	L4	CO1	PO1 PO2
	b)	Determine the axial forces induced in the members of a truss as shown in figure.	6 Marks	L4	CO1	PO1 PO2



UNIT-II

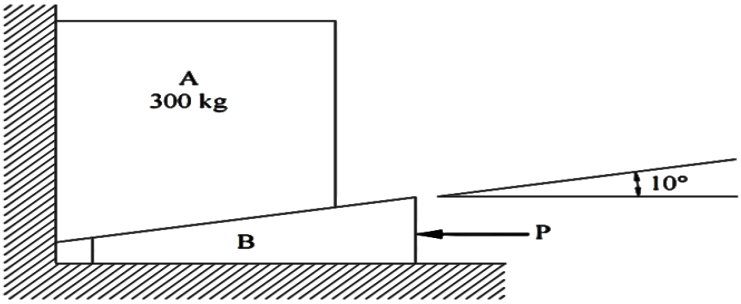
3.	a)	A uniform ladder of weight 800N and of length 7 m rests on a horizontal ground and leans against a smooth vertical wall. The angle made by the ladder with the horizontal is 60°. When a man of weight 600N stands on the ladder at a distance 4m from the top of the ladder, the ladder is at the point of sliding. Determine the coefficient of friction between the ladder and the floor.	6 Marks	L4	CO1	PO1 PO2

	b)	Three blocks are placed on the surface one above the other as shown in figure. The static coefficient of friction between the blocks and between block C and surface is also shown. Determine the maximum value of P that can be applied before any slipping takes place.	6 Marks	L4	CO1	PO1 PO2

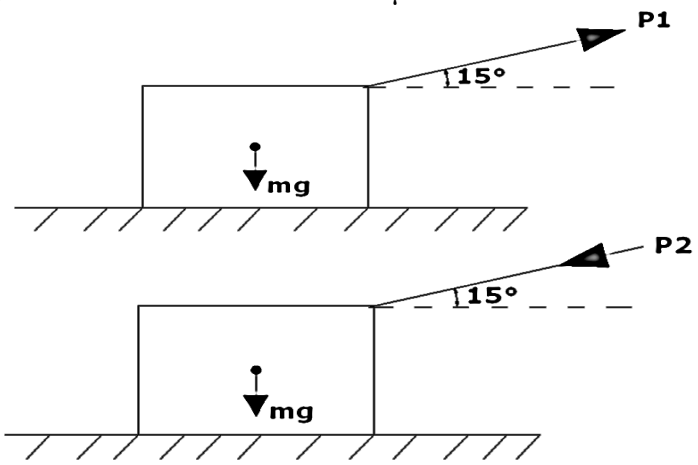


(OR)

4.	a)	If the coefficient of static friction equals 0.3 for all surfaces of contact, determine the smallest value of force P necessary to raise the block A. Neglect the weight of the wedge B.	8 Marks	L4	CO1	PO1 PO2

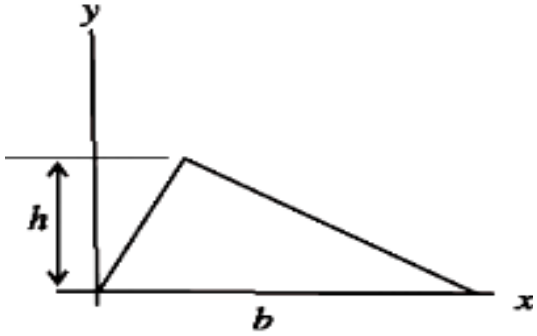


	b)	A wooden block rests on a horizontal plane. Determine the force required to (i) pull it (ii) push it. Assume the mass of the block to be 5kg and the coefficient of friction μ= 0.4.	4 Marks	L4	CO1	PO1 PO2



UNIT-III

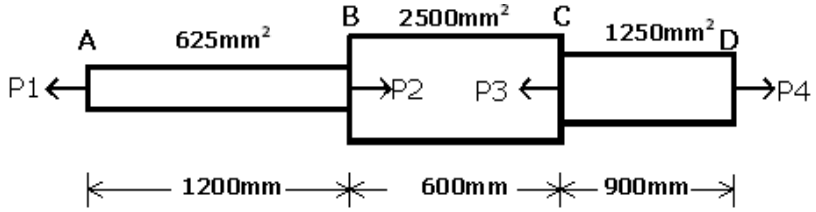
5.	a)	Derive an expression to determine the moment of inertia of a semi circle about its diametric base.	6 Marks	L4	CO1	PO1 PO2
	b)	Determine the y coordinate of the centroid of a uniform triangular lamina as shown in figure.	6 Marks	L4	CO1	PO1 PO2



(OR)

6.	a)	Find the mass moment of inertia of a solid cylinder of radius r, height h and mass m about centroidal x and y axes.	6 Marks	L4	CO1	PO1 PO2
	b)	State and explain Pappus and Guldinus theorems for surface of revolution and volume of revolution.	6 Marks	L4	CO1	PO1 PO2

UNIT-IV

7.	a)	Derive the relation among modulus of elasticity, modulus of rigidity and bulk modulus.	6 Marks	L4	CO1	PO1 PO2
	b)	A member ABCD is subjected to point loads P1, P2, P3 and P4 as shown in figure. Calculate the force P2 necessary equilibrium if P1 = 45 kN, P3 = 450 kN, P4 = 130 kN. Determine the total elongation of the member, assuming the modulus of elasticity as 2.1×10^5 N/mm². 	6 Marks	L4	CO1	PO1 PO2

(OR)

8.	a)	A steel bar is placed between two copper bars each having the same area and length as the steel bar is at 15°C. At this stage they are rigidly connected together at both the ends. When the temperature is raised to 315°C, the length of the bars increased by 1.5mm. Determine the original length and the final stresses in the bars. $E_s = 2.1 \times 10^5$ N/mm², $E_c = 1 \times 10^5$ N/mm². $\alpha_s = 0.000012$/°C. $\alpha_c = 0.0000175$/°C.	6 Marks	L4	CO1	PO1 PO2
	b)	A tensile load of 60 kN is gradually applied to a circular bar of 4cm diameter and 5cm long. If the value of $E = 2.0 \times 10^5$ N/mm², determine: i) stretch in the rod. ii) stress in the rod. iii) strain energy absorbed by the rod.	6 Marks	L4	CO1	PO1 PO2

UNIT-V

9.	a)	A cylindrical thin drum 80 cm in diameter and 3 m long has a shell thickness of 1 cm. If the drum is subjected to an internal pressure of 2.5 N/mm², determine i) change in diameter. ii) change in length. iii) change in volume. Take $E = 2 \times 10^5$ N/mm², Poisson's ratio = 0.25.	6 Marks	L6	CO2	PO1 PO2 PO3 PO6
	b)	Derive the equations for the circumferential and longitudinal stresses in a thin cylindrical shell.	6 Marks	L6	CO2	PO1 PO2 PO6

(OR)

10.		A compound cylinder is made by shrinking a cylinder of external diameter 200 mm and an internal diameter 160 mm over another cylinder of external diameter 160 mm and internal diameter 120 mm. The radial pressure at the junction after shrinking is 8 N/mm². Find the final stress set up across the section, when the compound cylinder is subjected to an internal fluid pressure of 60 N/mm².	12 Marks	L6	CO2	PO1 PO2 PO3 PO6

❀ ❀ ❀

CODE No.: 19BT20201 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations June - 2022

ELECTRIC CIRCUITS

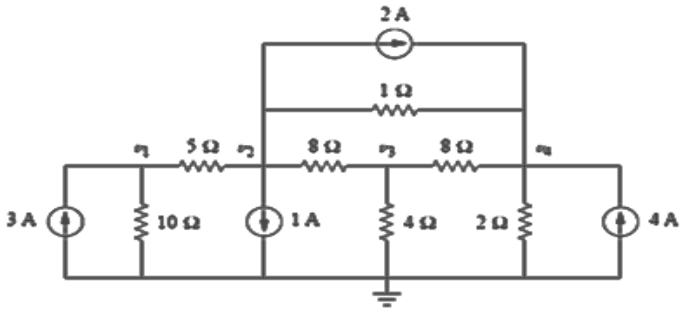
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

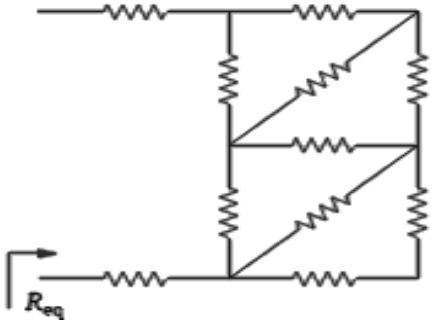
UNIT-I

1. Determine the node voltages of the circuit shown in figure. 12 Marks L3 CO1 PO2

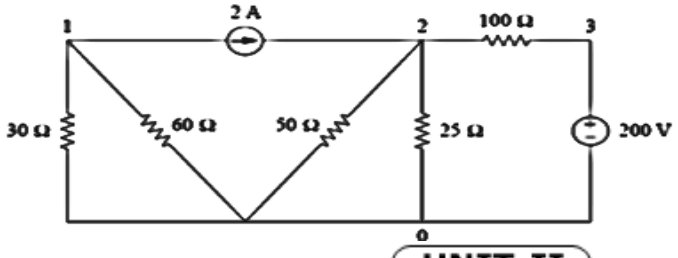


(OR)

2. a) Obtain the equivalent resistance R_{eq} of the circuit shown in figure all resistors have a value of 30 Ω. 6 Marks L3 CO1 PO2

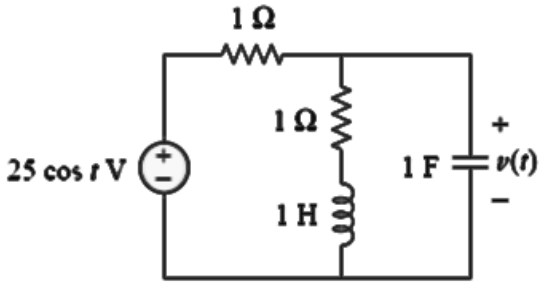


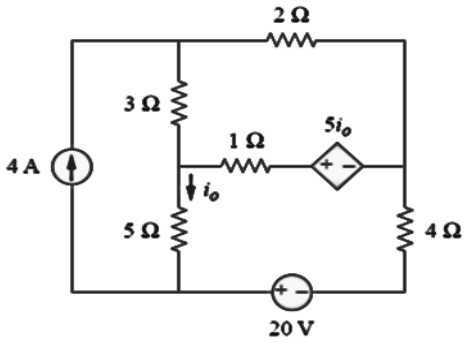
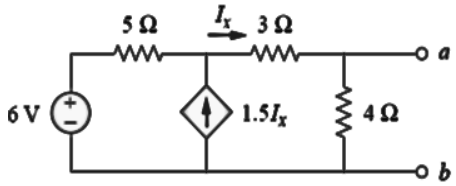
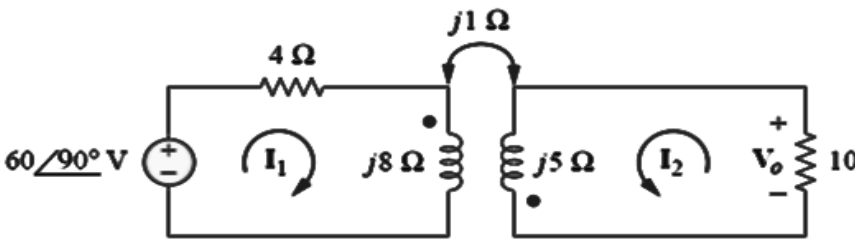
b) Determine the current through 25 Ω resistor using mesh analysis of the circuit shown in figure. 6 Marks L3 CO1 PO2

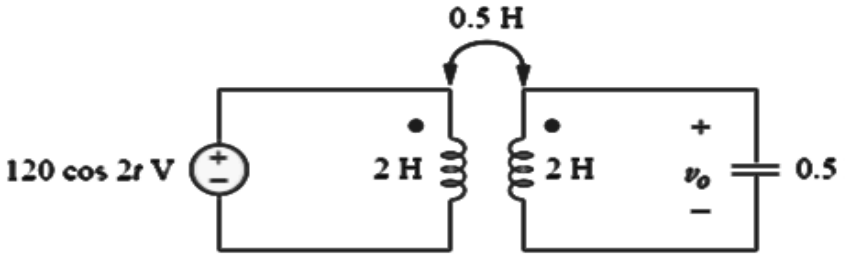


UNIT-II

3. a) Find impedance and $v(t)$ in the *RLC* circuit shown in figure. 6 Marks L3 CO1 PO2



	b)	A voltage V = 10 sinωt is applied to series RLC circuit. Under resonance condition the max voltage across capacitor is found to be 500 V, bandwidth is 400 rad/sec and the impedance at resonance is 100 ohms. Find the resonant frequency and circuit constants.	6 Marks	L3	CO1	PO3
		(OR)				
4.	a)	A Y-connected balanced three-phase generator with an impedance of (0.4+j0.3) Ω per phase is connected to a Y-connected balanced load with an impedance of (24+j19) Ω per phase. The line joining the generator and the load has an impedance of (0.6+j0.7) Ω per phase. Assuming a positive sequence for the source voltages and that Van = (120+j0) V find: i) the line voltages, ii) the line currents.	6 Marks	L3	CO1	PO2
	b)	Prove that $\tan\varphi = \sqrt{3}\left(\frac{W_2 - W_1}{W_2 + W_1}\right)$ in two wattmeter method.	6 Marks	L2	CO1	PO2
		UNIT-III				
5.	a)	Find i_0 of the circuit shown in figure using superposition theorem. 	6 Marks	L4	CO1	PO5
	b)	State and explain Millman's theorem with suitable example.	6 Marks	L3	CO1	PO1
		(OR)				
6.	a)	Obtain the Thevenin's equivalent circuit of the network shown in figure. 	6 Marks	L4	CO1	PO5
	b)	State and explain Reciprocity theorem with suitable example.	6 Marks	L2	CO1	PO1
		UNIT-IV				
7.	a)	Two coils connected in series-aiding fashion have a total inductance of 250 mH. When connected in a series-opposing configuration, the coils have a total inductance of 150 mH. If the inductance of one coil is three times the other, find and M. What is the coupling coefficient?	6 Marks	L2	CO1	PO2
	b)	Determine the mesh currents of the circuit shown in figure. 	6 Marks	L4	CO1	PO2
		(OR)				
8.	a)	Obtain v_0 of the circuit shown in figure.	6 Marks	L4	CO1	PO2



b) Two coils shown in figure have L_1=50mH, L_2=120mH and coefficient k=0.5. find $i_1(t)$and $v_2(t)$, given that $v_1(t) = 20\cos\omega t$ and $i_2(t) = 4\sin\omega t$, ω=2000 rad/s — 6 Marks | L4 | CO1 | PO2

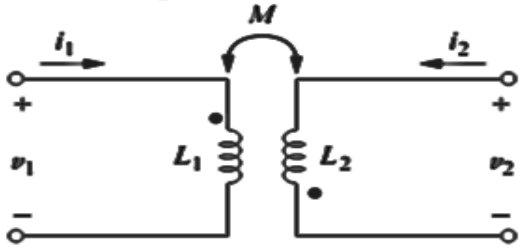


Fig. 4

UNIT-V

9. a) Enumerate the various characteristics that a filter should posses for implementation in signal processing circuits. — 6 Marks | L2 | CO1 | PO1

b) Design *k*-type band pass filter having a design impedance of 500 Ω and cut-off frequencies 1 kHz and 10 kHz. — 6 Marks | L4 | CO2 | PO3

(OR)

10. a) Derive the expressions for attenuation and phase shift in pass band and stop band for a symmetrical *T*-section high pass filter. — 6 Marks | L3 | CO2 | PO2

b) Design a constant-*k* filter to eliminate band of frequencies lying between 2000 Hz and 6000 Hz with a design impedance of 600 Ω. Also determine attenuation and phase shift 1 kHz and 4 kHz. — 6 Marks | L4 | CO2 | PO3

CODE No.: 19BT20241 SVEC-19

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations June – 2022

NETWORK ANALYSIS

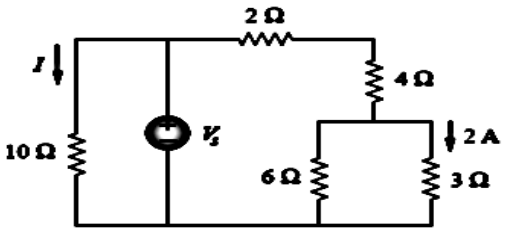
[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	State Ohms law and mention the limitations of the Law	4 Marks	L1	CO1	PO1
	b)	Find *I* and *Vs* in the circuit shown in figure, if the current through the 3 Ohm resistor is 2 A.	8 Marks	L4	CO1	PO2



(OR)

2.	a)	Explain how voltage source with a source resistance can be converted into an equivalent current source?	4 Marks	L2	CO1	PO2
	b)	An electric heater connected to a 120-V source consists of two identical 0.4 Ohm elements made of Nichrome wire. The elements provide low heat when connected in series and high heat when connected in parallel. Find the power at low and high heat settings.	8 Marks	L3	CO2	PO6

UNIT-II

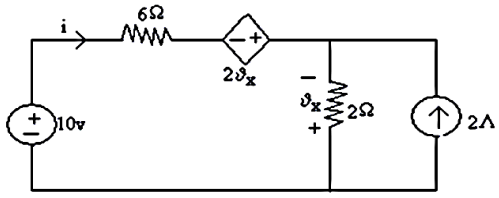
3.	a)	Draw the phasor representation of voltage and current for Resistor, inductor and capacitor with sinusoidal excitation.	4 Marks	L2	CO1	PO1
	b)	In an AC circuit source applied is *500 sin(100t)* across series combination of 10 ohms and 10 F, calculate source current flowing through circuit, form impedance and power triangle.	8 Marks	L4	CO1	PO2

(OR)

4.	a)	Draw the current loci for an RL Series circuit having constant reactance but variable resistance.	6 Marks	L2	CO1	PO2
	b)	A radio tuner having series RLC circuit is connected across a variable frequency supply and has R = 12 Ohms, L = 1 mH and C = 1000 PF. Calculate resonant frequency, cut-off frequencies and Q factor of the tuner.	6 Marks	L3	CO2	PO6

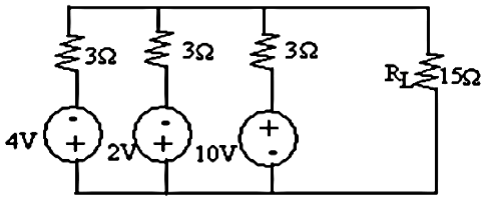
UNIT-III

5.	a)	State and explain Maximum power transfer theorem and derive the necessary conditions for maximum power transfer for a DC excitations.	6 Marks	L2	CO1	PO1
	b)	Find the current i in the circuit shown in figure using superposition theorem.	6 Marks	L3	CO1	PO2



(OR)

6.	a)	State and explain Millman's theorem.	4 Marks	L1	CO1	PO1
	b)	Find the current through load resistance RL and also find the voltage drop across load using Millman's theorem. as shown in figure.	8 Marks	L4	CO1	PO2



UNIT-IV

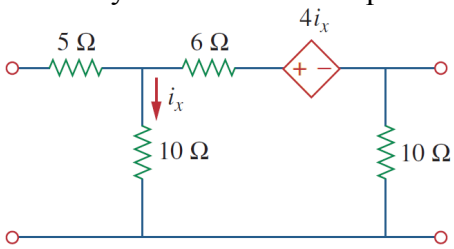
7.	a)	Distinguish between transient response and steady state response of a circuit.	4 Marks	L2	CO1	PO2
	b)	A series RC circuit with R = 50 ohms and C = 2 micro farad has a sinusoidal voltage source $V = 150\ Sin(500t\ \varphi+\pi/3)$ volts applied at a time when φ=0. Find the expression for the total current. Use Laplace transforms method.	8 Marks	L4	CO1	PO5

(OR)

8.	a)	Define a time constant and derive its expression for a RC circuit excited with DC.	4 Marks	L2	CO1	PO1
	b)	A series RLC circuit with R=2 ohms, L=1H and C= 1F has a sinusoidal voltage source $v(t) = 250Sin(500t)$ applied at time t=0. Determine the transient current i(t) using time domain approach. Assume zero initial conditions.	8 Marks	L4	CO2	PO2

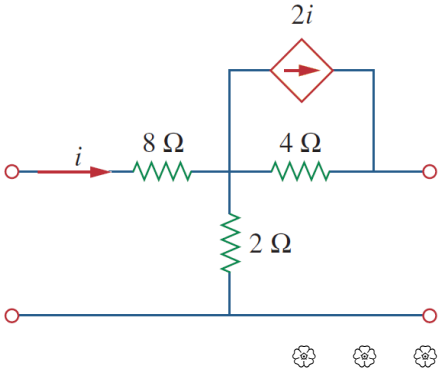
UNIT-V

9.	a)	Express h parameters in terms of admittance parameters for a generalized network.	6 Marks	L2	CO1	PO1
	b)	Find the h parameters of the network in figure. Invistigate whether the netwok is symmetrical and reciprocal.	6 Marks	L4	CO1	PO4



(OR)

10.	a)	Define reciprocity and symmetry for a generalized two port network and derive the conditions for reciprocity and symmetry in terms of Z parameters.	6 Marks	L2	CO1	PO1
	b)	Determine the y parameters for the two-port shown in figure. Invistigate whether the netwok is symmetrical and reciprocal.	6 Marks	L4	CO1	PO4



CODE No.: 19BT20301 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations June – 2022

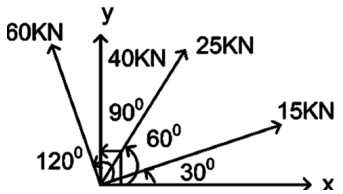
BASIC ENGINEERING MECHANICS

[Mechanical Engineering]

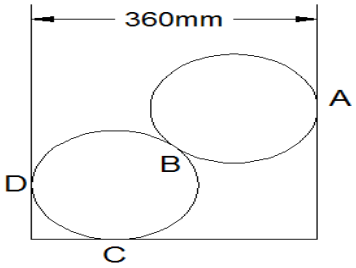
Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

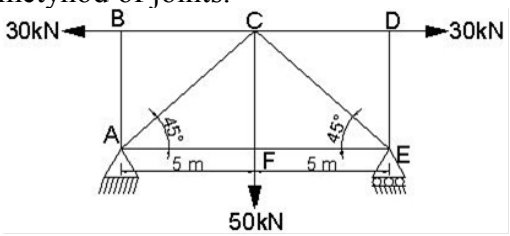
UNIT-I

1.	Four forces of magnitude 15KN, 25KN, 40KN and 60KN are acting at a point O as shown in Fig. The angles made by the above forces with X axis are 30, 60, 90 and 1200 respectively. Find magnitude and direction of the resultant force. 	12 Marks	L2	CO1	PO1 PO2

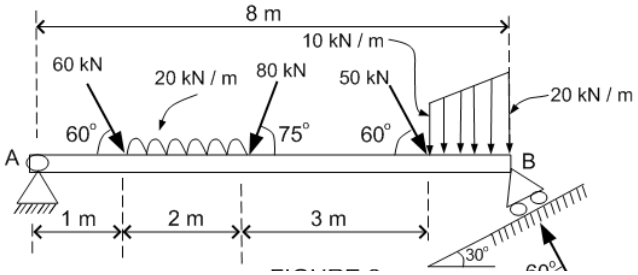
(OR)

2.	Two smooth spheres each of radius of 100mm and weighing 100N rest in a horizontal channel having vertical walls, the distance between which is 360mm.Find the reactions at the points A,B,C and D shown in fig. 	12 Marks	L2	CO1	PO1 PO2

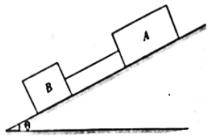
UNIT-II

3.	Determine the forces in all the members of a truss shown in figure using metyhod of joints. 	12 Marks	L2	CO1	PO1 PO2

(OR)

4.	If the beam shown in below figure is hinged at A and simply supported at B, find the reactions at the supports. 	12 Marks	L2	CO1	PO1 PO2

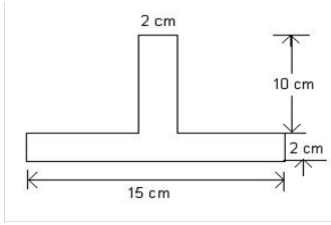
UNIT-III

5.		Block A weighing 1000N and block B weighing 500N are connected by a flexible wire. The coefficient of friction between block A and the plane is 0.5. While that for block B and the plane is 0.2. Determine the value of inclination of the plane the system will have impending motion down the plane? 	12 Marks	L2	CO1	PO1 PO2

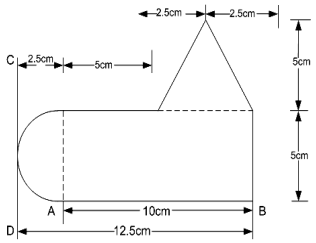
(OR)

6.		A uniform ladder of length 5m and weight 250N rests on a horizontal ground and leans against a rough vertical wall. The coefficient of static friction between ladder and the floor is 0.3 and between the ladder and vertical wall is 0.2. When a weight of 900 N is placed on the ladder at a distance of 2 m from the top of the ladder, the ladder is at the point of sliding. Determine: i) The angle made by the ladder with the horizontal. ii) Reactions at the foot and top of the ladder.	12 Marks	L2	CO1	PO1 PO2

UNIT-IV

7.	a)	State the methods of determining the centre of gravity?	4 Marks	L2	CO2	PO1 PO2
	b)	Find the centroid of the inverted T section shown in below figure. 	8 Marks	L2	CO2	PO1 PO2

(OR)

8.		Determine the centre of gravity of the plane uniform lamina shown in Fig. 	12 Marks	L3	CO2	PO1 PO2

UNIT-V

9.	a)	State the applications of Impulse and Momentum Equation.	6 Marks	L2	CO3	PO1
	b)	A gofer hits a 46 gm ball with an initial velocity of 48 m/s at angle of 240 with the horizontal. Determine the initial KE of the ball the KE of the ball when it reaches its maximum height.	6 Marks	L2	CO3	PO1 PO2

(OR)

10.	a)	Compare and contrast between Simple and Compound pendulums.	6 Marks	L2	CO4	PO1
	b)	A simple pendulum of amplitude 4° performs 24 oscillations in one minute. Find i) length of the pendulum. ii) maximum acceleration of the bob, iii) maximum linear velocity of the bob; and iv) maximum angular velocity of the bob.	6 Marks	L2	CO4	PO1 PO2

CODE No.: 19BT20302 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations June – 2022

MATERIAL SCIENCE AND ENGINEERING
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Write the crystal defects in material structures.	6 Marks	L1	CO1	PO1
	b)	Difference between BCC and FCC crystal structures.	6 Marks	L2	CO1	PO2
		(OR)				
2.		State and explain Gibb's Phase rule and Hume Rothery rule with suitable examples.	12 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	Explain the terms Annealing, Normalizing and Tempering.	6 Marks	L2	CO1	PO2
	b)	Explain Carburizing with neat sketch.	6 Marks	L2	CO1	PO2
		(OR)				
4.		Explain Isothermal transformation diagrams and continuous cooling transformation diagrams neatly.	12 Marks	L2	CO1	PO2
		UNIT-III				
5.	a)	Write classification and applications of steel.	6 Marks	L2	CO2	PO3
	b)	Write a note on stainless steel and tool steels.	6 Marks	L1	CO2	PO3
		(OR)				
6.		Draw the microstructures of nodular cast iron, mottled cast iron. Mention its applications and properties.	12 Marks	L3	CO2	PO4
		UNIT-IV				
7.		Write the structure, applications and properties of Nickel and its alloy, copper and its alloy.	12 Marks	L2	CO2	PO1
		(OR)				
8.	a)	Explain the properties of aluminum and its alloys.	6 Marks	L1	CO2	PO1
	b)	Explain about refractory and precious metals.	6 Marks	L1	CO2	PO1
		UNIT-V				
9.	a)	Write the differences between particles reinforced composites fiber reinforced composites.	6 Marks	L1	CO2	PO2
	b)	Write the characteristics of MMC material.	6 Marks	L1	CO2	PO2
		(OR)				
10.		Define polymerization reaction and explain the types of polymers in detail.	12 Marks	L2	CO2	PO1

CODE No.: 19BT20501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations June - 2022

DIGITAL LOGIC DESIGN

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Express the following numbers in decimal: i) $(10110.0101)_2$ ii) $(26.24)_8$	6 Marks	L3	CO1	PO1
	b)	Simplify using Boolean Algebra and implement the simplified expression using basic logic gates (AND, OR, NOT). i) $A + CD + (A + D')(C' + D)$. ii) $A'B(D' + CD) + B(A + A'CD)$.	6 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Given the 8-bit data word 11000100, generate the 12-bit composite word for the Hamming code that corrects single errors and detects double errors.	6 Marks	L3	CO1	PO1
	b)	Find the complement of the following expressions: i) $(BC' + A'D)(AB' + CD')$. ii) $(AB' + C)D' + E$.	6 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Express the Boolean function $F=A+B'C$ in a sum of min-term form.	6 Marks	L4	CO1	PO2
	b)	Draw a logic diagram using only two-input NAND gates to implement the following expression: $(AB+A'B')(CD'+C'D)$.	6 Marks	L4	CO1	PO3
		(OR)				
4.	a)	Simplify the following Boolean expressions to a minimum number of literals: i) $xy + x(wz+wz')$ ii) $xy' + y'z' + x'z'$	6 Marks	L4	CO1	PO2
	b)	Simplify the following expression to sum-of-products and products-of-sums. $yzw' + xyz' + xzw$.	6 Marks	L4	CO1	PO2

UNIT-III

5.		Describe the operations performed by the following logic circuits with an example. i) Comparator ii) Decoder iii) Encoder	12 Marks	L2	CO2	PO1
		(OR)				
6.	a)	A Combinational logic circuit is defined by the following Boolean functions: F1 = ABC + AC F2 = ABC + AB F3= ABC + AB Design the circuit with a Decoder and external gates.	8 Marks	L4	CO2	PO4
	b)	Implement 64 × 1 Multiplexer with four 16 × 1 and one 4 ×1 Multiplexer.	4 Marks	L3	CO2	PO5

UNIT-IV

7.	a)	Describe the operation of the SR Latch using NAND gate with the help of truth table, transition table and the circuit.	6 Marks	L2	CO2	PO1
	b)	Design a 4-bit ripple counter using T Flip-Flops.	6 Marks	L4	CO2	PO3
		(OR)				
8.		Design a sequential circuit with two D-Flip A and B, 1 input x. when x=0, the state of the circuit remains same. When x=1, the circuit goes through the state transitions from 00 to 01 to 10 to 11 and back to 00. Show the state diagram, state tables, state transition maps and circuit diagram.	12 Marks	L4	CO2	PO3

UNIT-V

9.	a)	Write short notes on the following ROM variants: i) PROM ii) EPROM iii) EEPROM	6 Marks	L2	CO2	PO1
	b)	With a block diagram explain the functioning of a PAL.	6 Marks	L2	CO2	PO1
		(OR)				
10.		A combinational circuit is defined by the following Boolean functions : F1 (X, Y, Z) = $\sum$ (1, 2, 4, 6) and F2 (X, Y, Z) = $\sum$ (0, 1, 6, 7) Derive the PLA programming table and the PLA structure for the given functions.	12 Marks	L4	CO2	PO4

CODE No.: 19BT21501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations June – 2022

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss about java Buzzwords.	6 Marks	L1	C01	PO1
	b)	What is Java Virtual Machine? How is it works?	6 Marks	L2	C01	PO1
		(OR)				
2.	a)	Explain the basic concepts of object oriented programming.	6 Marks	L1	C01	PO1
	b)	Discuss about Access control in java.	6 Marks	L2	C01	PO1

UNIT-II

3.	a)	Write short notes on type conversion in java with examples.	6 Marks	L2	C01	PO2
	b)	Explain in detail about method overloading and illustrate with an example.	6 Marks	L1	C02	PO2
		(OR)				
4.	a)	Illustrate about decision making statements in java.	6 Marks	L1	C01	PO3
	b)	Explain the following Java String class methods. i) concat() ii) chatAt() iii) substring()	6 Marks	L2	C02	PO2

UNIT-III

5.	a)	How multilevel inheritance is implemented in java? Demonstrate with an example.	6 Marks	L2	C02	PO4
	b)	Can we create object for an abstract class? Demonstrate with an example java program.	6 Marks	L2	C02	PO3
		(OR)				
6.	a)	What is an interface? Explain its implementation with suitable program.	6 Marks	L1	C02	PO2
	b)	How to define a package? How to access, import a package? Explain with examples.	6 Marks	L2	C02	PO3

UNIT-IV

7.	a)	How to handle multiple catch blocks for a nested try block? Explain with an example.	6 Marks	L2	C02	PO3
	b)	Write a program to explain thread priorities usage.	6 Marks	L2	C02	PO3
		(OR)				
8.	a)	With a program illustrate user defined exception handling.	6 Marks	L2	C02	PO3
	b)	Discuss about collection frame work hierarchy.	6 Marks	L2	C03	PO2

UNIT-V

9.	a)	What is the role of event listeners in event handling? List the Java event listeners.	6 Marks	L2	C03	PO3
	b)	How to pass parameters to applets? Illustrate with suitable example.	6 Marks	L3	C03	PO3
		(OR)				
10.	a)	With a neat diagram, explain the life cycle of Applet.	6 Marks	L2	C03	PO2
	b)	What is an adapter class? Explain its role in event handling.	6 Marks	L3	C03	PO3

CODE No.: 19BT1BS02 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations March - 2021

BIOLOGY FOR ENGINEERS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Compare biological models and manmade systems.	6 Marks	L2	CO1	PO2
	b)	Explain prokaryotes and eukaryotes with neat diagrams.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Classify living organisms.	6 Marks	L2	CO1	PO2
	b)	Illustrate molecular taxonomy.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Summarize the industrial applications of enzymes.	6 Marks	L2	CO1	PO1
	b)	Explain the structure and functions of proteins.	6 Marks	L2	CO1	PO1
		(OR)				
4.	a)	Explain the importance of various biomolecules in the formation of living organisms.	7 Marks	L2	CO1	PO1
	b)	Define enzymes and describe their applications.	5 Marks	L1	CO1	PO5
		UNIT-III				
5.	a)	How Mendel laws are important in biology as Newton laws in physics? Explain.	6 Marks	L2	CO2	PO1
	b)	What is the process by which information is transferred from DNA to mRNA?	6 Marks	L1	CO2	PO1
		(OR)				
6.		Explain about translation and single gene disorders.	12 Marks	L2	CO2	PO1
		UNIT-IV				
7.	a)	Distinguish between Transgenic animals and cloned animals with suitable examples.	6 Marks	L4	CO3	PO1
	b)	How Biosensors and biochips are prepared? List their applications.	6 Marks	L4	CO3	PO6
		(OR)				
8.	a)	Explain major steps in the recombinant DNA technology and add a note on recombinant microbes.	8 Marks	L2	CO3	PO6
	b)	Identify merits and demerits of Transgenic plants.	4 Marks	L3	CO3	PO1
		UNIT-V				
9.	a)	What is neuron and synapse? Explain the process of Neurotransmission.	6 Marks	L2	CO1	PO1
	b)	Summarize the applications of DNA finger printing.	6 Marks	L2	CO3	PO6
		(OR)				
10.	a)	Compare different types of Genomics.	6 Marks	L2	CO1	PO1
	b)	Explain about DNA Microarray and its applications.	6 Marks	L2	CO3	PO6

CODE No.: 19BT1BS03 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations March – 2021

ENGINEERING PHYSICS

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	List the difference between interference and diffraction.	2 Marks	L1	CO1	PO1
	b)	Discuss in detail the Fraunhofer diffraction at a single slit.	10 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Summarize the theory of Quarter wave plate and Half wave plate.	4 Marks	L2	CO1	PO1
	b)	Describe the construction and working of a Nicol's Prism.	8 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Explain the physical significance of gradient, divergence and curl.	4 Marks	L2	CO2	PO1
	b)	Identify the four Maxwell's field equations and explain their physical significance.	8 Marks	L3	CO2	PO1
		(OR)				
4.	a)	Recall the principle behind the functioning of optical fiber. Explain the differences between the step index fiber and graded index fiber.	9 Marks	L2	CO2	PO1
	b)	Calculate the numerical aperture and acceptance angle for an optical fiber with core and cladding refractive indices being 1.48 and 1.45 respectively.	3 Marks	L3	CO2	PO2
		UNIT-III				
5.	a)	Discuss the origin of energy band formation in solids.	5 Marks	L2	CO3	PO1
	b)	Classify the solids in to conductors, semiconductors and insulators based on the formation of energy bands.	7 Marks	L2	CO3	PO1
		(OR)				
6.	a)	State Hall effect. Derive an expression for Hall coefficient. Mention its applications.	10 Marks	L3	CO3	PO2
	b)	The R_H of a specimen is 3.66×10^{-4} m^3c^{-1}. Its resistivity is $8.93 \times 10^{-3}\Omega m$. Find μ and n.	2 Marks	L1	CO3	PO2
		UNIT-IV				
7.	a)	Define dielectric polarization.	2 Marks	L1	CO4	PO1
	b)	Outline an expression for internal field of an atom in a dielectric material.	10 Marks	L2	CO4	PO1 PO2
		(OR)				
8.	a)	State magnetic moment. Explain the origin of magnetic moment in an atom.	8 Marks	L2	CO4	PO2
	b)	Classify the magnetic materials and explain them.	4 Marks	L2	CO4	PO1
		UNIT-V				
9.	a)	Distinguish Type I and Type II superconductors.	4 Marks	L4	CO5	PO1
	b)	What are Cooper pairs? Outline the BCS theory of superconductivity.	8 Marks	L1	CO5	PO1
		(OR)				
10.	a)	Describe any one method for synthesize nanomaterials.	6 Marks	L2	CO5	PO1
	b)	List the applications of nanomaterials.	6 Marks	L1	CO5	PO1

❀ ❀ ❀

CODE No.: 19BT1BS04 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations March - 2021

ENGINEERING CHEMISTRY

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		Discuss the particle in one dimensional box using quantum mechanical concept and prove that electronic energy levels are quantized.	12 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Describe the structure of H_2O and NH_3 molecule in terms of VSEPR theory.	5 Marks	L2	CO1	PO1
	b)	Predict the magnetic property and bond order of carbon monoxide molecule based on its energy level diagram.	7 Marks	L3	CO1	PO2
		UNIT-II				
3.		Write the principle of EDTA method and describe the estimation of hardness of water by EDTA method.	12 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Calculate the hardness of water sample with 0.4g of $CaCO_3$ dissolved in dil. HCl and the solution was made up to 500 ml with distilled water. 50 ml of the solution required 35 ml of the EDTA solution for the titration. 50 ml of hard water sample required 25 ml of EDTA and after boiling and filtering required 15 ml of the EDTA solution.	6 Marks	L3	CO2	PO2
	b)	Discuss the adverse effects of fluorides on human health.	6 Marks	L3	CO2	PO 6
		UNIT-III				
5.	a)	Explain the construction and working of solid oxide fuel cell.	6 Marks	L2	CO3	PO1
	b)	Discuss different methods used for prevention of corrosion of metal and discuss any one method.	6 Marks	L1	CO3	PO2
		(OR)				
6.	a)	Why does corrosion occur in steel pipe connected to copper plumbing?	4 Marks	L1	CO3	PO1
	b)	Describe the construction and working of the lead acid battery with chemical equations.	8 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	Explain different types of fundamental modes of vibrations.	6 Marks	L2	CO4	PO1
	b)	Write the principle and applications of Transmission Electron Microscope.	6 Marks	L1	CO4	PO1
		(OR)				
8.		Discuss the principle and working of UV - Visible spectrometer with the help of a block diagram.	12 Marks	L2	CO4	PO1

UNIT-V

9.		Discuss in detail about various mechanisms of lubrication.	12 Marks	L2	CO5	PO1
		(OR)				
10.	a)	What is meant by cracking of petroleum? Describe the fixed-bed catalytic cracking process with a neat diagram.	7 Marks	L2	CO5	PO1
	b)	Calculate the HCV and LCV of coal having the following compositions; carbon = 80%, hydrogen = 10%, nitrogen = 4%, sulphur = 2%, ash = 4%, latent heat of steam = 587 kcal/kg.	5 Marks	L3	CO5	PO2

CODE No.: 19BT2BS01 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations March - 2021

TRANSFORMATION TECHNIQUES AND LINEAR ALGEBRA

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Find the Fourier series of the function $f(x) = x\sin x$ *in* $(-1,1)$.	6 Marks	L4	CO1	PO1
	b)	Establish Fourier sine transform for $f(x) = xe^{-ax}$.	6 Marks	L1	CO1	PO2

(OR)

2.		Show that $x = 1 - \frac{8}{\pi^2}\left[\frac{1}{1^2}\cos\frac{\pi x}{2} + \frac{1}{3^2}\cos\frac{3\pi x}{2} + \frac{1}{5^2}\cos\frac{5\pi x}{2} + \ldots\right]$ in the interval (0, 2).	12 Marks	L2	CO1	PO2

UNIT-II

3.	a)	Determine $L\{f(t)\}$ *where* $f(t) = t^2e^{-3t}\sin 2t$.	6 Marks	L3	CO1	PO1
	b)	Find the Laplace transform of $\int_0^t \frac{e^t \sin t}{t}\,dt$.	6 Marks	L1	CO1	PO1

(OR)

4.	a)	Making use of Laplace transform, evaluate $\int_0^\infty \frac{\cos at - \cos bt}{t}\,dt$.	6 Marks	L3	CO1	PO2
	b)	Evaluate $L\{t^2 e^{-3t}\sin 2t\}$.	6 Marks	L5	CO1	PO1

UNIT-III

5.	a)	Find the inverse Laplace transform of $\log\left(\frac{s+a}{s+b}\right)$.	6 Marks	L1	CO1	PO1
	b)	Evaluate $L^{-1}\left[\frac{1}{(s^2+a^2)^2}\right]$ using convolution theorem.	6 Marks	L3	CO1	PO2

(OR)

6.		Solve the differential equation $\frac{d^2x}{dt^2} - 4\frac{dx}{dt} - 12x = e^{3t}$, given that $x(0) = 1,\ x'(0) = -2$ by using Laplace transforms.	12 Marks	L3	CO1	PO2

UNIT-IV

7.	a)	Find the rank of matrix $A = \begin{pmatrix} 2 & -2 & 0 & 6 \\ 4 & 2 & 0 & 2 \\ 1 & -1 & 0 & 3 \\ 1 & -2 & 1 & 2 \end{pmatrix}$ by reducing it into echelon form.	6 Marks	L1	CO2	PO1
	b)	Determine the Eigen values and Eigen vectors of $B = 2A^2 - \frac{1}{2}A + 3I$, *where* $A = \begin{bmatrix} 8 & -4 \\ 2 & 2 \end{bmatrix}$.	6 Marks	L3	CO2	PO2

(OR)

8.	Find the orthogonal transformation which transforms the quadratic form $3x^2 + 3y^2 + 3z^2 + 2xy + 2xz - 2yz$ to canonical form and write the corresponding canonical form.	12 Marks	L1	CO2	PO2

UNIT-V

9.	a)	Check whether the set of vectors $\begin{bmatrix} 1 \\ -1 \\ 0 \end{bmatrix}, \begin{bmatrix} 0 \\ 1 \\ -1 \end{bmatrix}$ *and* $\begin{bmatrix} -1 \\ 0 \\ 1 \end{bmatrix}$ is linearly independent or not.	6 Marks	L2	CO2	PO1
	b)	Show that the transformation $T: R^2 \to R^3$ defined by $T\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -y \\ x+2y \\ 3x-4y \end{bmatrix}$ is linear.	6 Marks	L2	CO2	PO1

(OR)

10.	a)	Show that the vectors $\begin{bmatrix} 1 \\ -1 \\ 3 \end{bmatrix}, \begin{bmatrix} -1 \\ 5 \\ 1 \end{bmatrix}$ *and* $\begin{bmatrix} 1 \\ -3 \\ 1 \end{bmatrix}$ form a basis of $R^3(R)$.	6 Marks	L2	CO2	PO1
	b)	Show that the linear transformation $T: R^2 \to P_1$ defined by $T\begin{bmatrix} a \\ b \end{bmatrix} = a + (a+b)x$ is one-to-one and onto, where P_1 is a vector space of all linear polynomial over real field.	6 Marks	L2	CO2	PO2

CODE No.: 19BT2BS02 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations March – 2021

APPLIED PHYSICS
[Civil Engineering, Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Classify the optical fibres based on refractive index profile and modes of propagation with neat sketch.	9 Marks	L2	CO1	PO1
	b)	Calculate the fractional change in refractive indices and numerical aperture of a given optical fiber whose refractive indices are 1.49 and 1.45 respectively.	3 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Summarize the principle of optical fiber. Derive an expression for acceptance angle and numerical aperture of an optical fiber.	8 Marks	L2	CO1	PO2
	b)	What is a sensor? Explain the working mechanism of temperature sensor.	4 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Explain the reverberation time based on Sabine's formula.	7 Marks	L2	CO1	PO1
	b)	List the requirements of an acoustic good hall. Explain how these requirements can be achieved.	5 Marks	L1	CO1	PO1
		(OR)				
4.	a)	Define ultrasonics. Describe the Magnetostriction method for their production.	8 Marks	L2	CO1	PO1
	b)	Write the industrial application of ultrasonics.	4 Marks	L1	CO1	PO1
		UNIT-III				
5.	a)	Deduce expressions for time of flight and horizontal range of a projectile in inclined projection.	7 Marks	L2	CO2	PO2
	b)	Show that the path of a projectile is a parabola in an inclined projection on ground level.	5 Marks	L1	CO2	PO2
		(OR)				
6.	a)	Derive an expression for work energy equation for a body of weight W undergoing a translation motion.	8 Marks	L2	CO2	PO2
	b)	A body weighing 300 N is pushed up a 300 plane by a 400 N force acting parallel to the plane. If the initial velocity of the body is 1.5 m/s and the coefficient of kinetic friction is $\mu = 0.2$, what velocity will the body have after moving 6 m?	4 Marks	L1	CO2	PO2
		UNIT-IV				
7.		Explain rectilinear flow of heat conduction along a uniform bar.	12 Marks	L2	CO2	PO1
		(OR)				
8.	a)	Derive the equation for the heat conduction through compound media in series combination.	6 Marks	L3	CO2	PO2
	b)	Discuss the principle of Lee's disc method.	6 Marks	L2	CO2	PO1
		UNIT-V				
9.	a)	Explain any one method for preparation of metallic glasses.	6 Marks	L2	CO3	PO1
	b)	Discuss the mechanical, thermal and optical properties of metallic glasses.	6 Marks	L2	CO3	PO1
		(OR)				
10.	a)	List the different types of composites and give their applications.	7 Marks	L1	CO3	PO1
	b)	Write various applications of shape memory alloys.	5 Marks	L1	CO3	PO1

CODE No.: 19BT10201 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations March – 2021

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

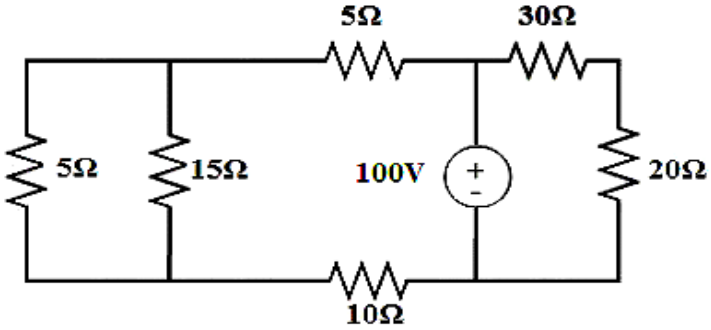
[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

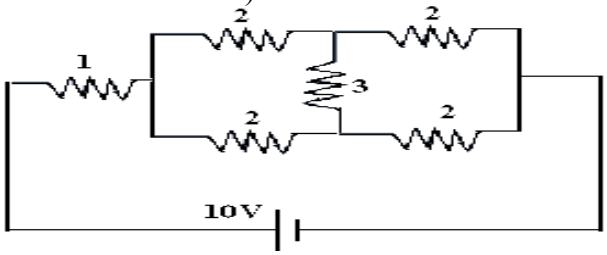
UNIT-I

1.	a)	With neat sketch, explain working principle of single loop generator.	8 Marks	L2	CO1	PO1
	b)	Find the current in each branch of the circuit shown in figure using current division method.	4 Marks	L3	CO1	PO2



(OR)

2.	a)	Find the total power dissipated in the circuit shown in the figure (All resistances are in ohms).	6 Marks	L3	CO1	PO2



	b)	A series combination of R=10Ω and L=20mH has a current i(t) = 5 cos(500t+100)A. Obtain the voltages v(t) and V, the phasor current I and sketch the phasor diagram.	6 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Sketch the typical layout and explain the operation of Thermal power plant.	8 Marks	L2	CO2	PO1
	b)	With neat sketch, explain the working of various types of UPS.	4 Marks	L2	CO2	PO7

(OR)

4.	a)	Derive the expression for most economical power factor.	6 Marks	L3	CO2	PO2
	b)	Explain the process of plate earthing with neat sketch.	6 Marks	L2	CO2	PO1

UNIT-III

5.	a)	Explain the constructional details of 3-phase induction motor and mention it's applications.	6 Marks	L2	CO3	PO5
	b)	Suggest the suitable device which transforms the voltage with constant frequency and power. Derive the EMF equation of that device.	6 Marks	L2	CO3	PO1

(OR)

6.	a)	List the starting methods of single phase induction motors. Explain the characteristics and principle of operation of capacitor start capacitor run induction motor.	6 Marks	L2	CO3	PO1
	b)	Select a suitable machine which uses steam turbine as the prime mover. Explain its constructional features with neat sketch.	6 Marks	L2	CO3	PO6
		UNIT-IV				
7.	a)	Distinguish between Avalanche and Zener Break downs.	6 Marks	L4	CO4	PO2
	b)	Explain the input and output characteristic of a transistor in common Emitter configurations.	6 Marks	L2	CO4	PO2
		(OR)				
8.		With a neat sketch, explain the operation of a Half wave rectifier. Also, find the ripple factor and efficiency of this rectifier.	12 Marks	L2	CO4	PO1
		UNIT-V				
9.	a)	With the help of a circuit diagram, show that the op-amp can be used as non-inverting adder.	6 Marks	L3	CO4	PO2
	b)	Derive the expressions for the closed-loop gain of a non-inverting and inverting amplifiers using op-amp.	6 Marks	L2	CO4	PO2
		(OR)				
10.	a)	Discuss the inverting and non-inverting amplifier circuits of an op-amp in closed loop configuration. Derive the expressions for the closed-loop gain in these circuits.	6 Marks	L2	CO4	PO2
	b)	Examine and derive an expression for V_0 of the integrator circuit by using op-amp.	6 Marks	L4	CO4	PO2

CODE No.: 19BT10501 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations March - 2021

PROGRAMMING FOR PROBLEM SOLVING

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define algorithm, explain properties of an algorithm.	6 Marks	L1	CO1	PO1
	b)	Evaluate the following expression according to operator precedence 4+int(3.78)+6*2/5+3**3**4//2.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Draw a flow chart to reverse a given number.	6 Marks	L3	CO1	PO2
	b)	Explain about sep, end options used in print() with example.	6 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Define suite and explain about the else suite with for statement.	6 Marks	L2	CO1	PO1
	b)	Display the following pattern using python script. 1 12 123 1234 12345	6 Marks	L3	CO1	PO2
		(OR)				
4.	a)	Write a python script to find the largest number among three numbers and display them in ascending order using if-else construct.	6 Marks	L3	CO1	PO2
	b)	Develop a python script to print factors for a given integer number.	6 Marks	L3	CO1	PO2

UNIT-III

5.	a)	Develop a python script to print diagonal elements sum in M*M list.	6 Marks	L3	CO1	PO2
	b)	List any four string handling methods used in Python. Illustrate with an example program.	6 Marks	L3	CO1	PO2
		(OR)				
6.	a)	Define stack. Write a python script to implement stack operations.	6 Marks	L3	CO1	PO3
	b)	Specify the functionalities of the following functions. i) keys(). ii) values(). iii) items(). iv) update().	6 Marks	L2	CO1	PO1

UNIT-IV

7.	a)	Develop a python script to implement Towers of Hanoi problem.	6 Marks	L3	CO2	PO3
	b)	Write a python script to remove all the occurrences of a given character from a text file, copy the resultant text into another text file. Find the total occurrences of the eliminated characters and display the count along with the contents of the text file on to the console.	6 Marks	L3	CO2	PO3
		(OR)				

8.	a)	Write a python script that reads a line of integers, and then displays each integer and the sum of all the integers.	6 Marks	L3	CO2	PO3
	b)	Explain functionality of the following functions. i) ones(). ii) arrange(). iii) logspace(). iv) zeros().	6 Marks	L1	CO2	PO1

UNIT-V

9.	a)	Write a python script to concatenate two data frames.	6 Marks	L3	CO2	PO2
	b)	Illustrate usage of loc() and iloc() with an example program.	6 Marks	L2	CO2	PO1
		(OR)				
10.	a)	Draw a scatter plots for knowing the relationship between two numerical variables.	6 Marks	L3	CO2	PO3
	b)	Load data from csv file to data frame and print head() and tail() of a data frame.	6 Marks	L3	CO2	PO2

CODE No.: 19BT20101 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations March – 2021

CIVIL ENGINEERING MATERIALS AND CONCRETE TECHNOLOGY

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain physical and chemical classification of rocks.	6 Marks	L4	CO1	PO1 PO2
	b)	What is quarrying of stone? Explain methods of quarrying.	6 Marks	L3	CO1	PO1
		(OR)				
2.	a)	What are the constituents of good brick earth? Explain.	6 Marks	L2	CO1	PO1
	b)	How is clay tiles manufactured? Explain its properties and applications.	6 Marks	L1	CO1	PO1

UNIT-II

3.	a)	List and explain the various methods of seasoning of timber.	6 Marks	L3	CO1	PO1 PO2
	b)	Summarize the various causes of decay of wood work and how its preservation is ensured.	6 Marks	L4	CO1	PO1
		(OR)				
4.	a)	Explain different types of shakes in timber.	6 Marks	L2	CO1	PO1
	b)	Discuss the various materials used in low cost housing.	6 Marks	L3	CO1	PO1

UNIT-III

5.	a)	What are the various ingredients required for manufacturing cement? State their functions.	6 Marks	L2	CO1	PO1
	b)	List out various types chemical admixtures. How these admixtures are supporting to the environment?	6 Marks	L4	CO1	PO1 PO2 PO7
		(OR)				
6.	a)	Bring out the detailed classification of aggregates and physical properties of aggregates.	6 Marks	L1	CO1	PO1 PO2
	b)	Mention the different tests to be conducted on fine aggregate and explain about bulking of sand.	6 Marks	L3	CO1	PO1 PO2 PO5

UNIT-IV

7.	a)	Discuss the factors affecting the workability in fresh concrete.	6 Marks	L4	CO1	PO1
	b)	Distinguish Segregation and Bleeding in concrete in detail.	6 Marks	L2	CO1	PO1 PO2
		(OR)				
8.	a)	Calculate the Gel/space ratio and the theoretical strength of a sample of concrete made with 500gm of cement and 0.5w/c ratio, on full hydration and 60% hydration.	6 Marks	L6	CO1	PO1 PO2 PO8
	b)	Explain how you estimate the quality of concrete by using ultrasonic pulse velocity test.	6 Marks	L4	CO1	PO1 PO2

UNIT-V

9.	a)	Distinguish between modulus of elasticity and dynamic modulus of elasticity of concrete.	6 Marks	L4	CO1	PO1 PO2
	b)	Explain the various factors affecting shrinkage of concrete.	6 Marks	L2	CO1	PO1
		(OR)				
10.		Design a concrete mix of M25 grade for a roof slab. Take a standard deviation of 4 MPa. The specific gravities of coarse aggregate and fine aggregate are 2.67 and 2.73 respectively. The bulk density of coarse aggregate is 1620Kg/m^3 and fineness modulus of fine aggregate is 2.76. A slump of 50mm is necessary. The water absorption of coarse aggregate is 1% and free moisture in fine aggregate is 3%. Design the concrete mix using ACI method. Assume any missing data suitably.	12 Marks	L6	CO2	PO1 PO2 PO3 PO8

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations March - 2021

ENGINEERING MECHANICS

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define the following with examples: Coplanar and Non-coplanar forces. Collinear and Non-collinear forces.	6 Marks	L4	CO1	PO1 PO2
	b)	The resultant of three forces is 60N as shown in Fig.1. Two of the three forces are also shown as 20N and 40N. Determine the third force.	6 Marks	L4	CO1	PO1 PO2

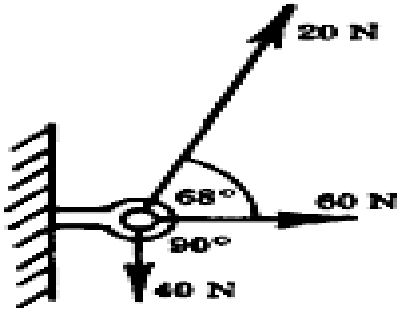


Fig.1

(OR)

2.		Two cylindrical identical rollers *A* and *B*, each of weight W = 500N are supported by an inclined plane and vertical wall and makes an angle of 30^0 with the horizontal as shown in Fig.2. Assuming all surfaces to be smooth, determine the reactions at A, B and C.	12 Marks	L4	CO1	PO1 PO2

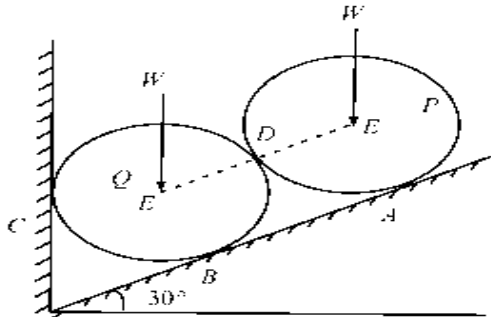


Fig.2

UNIT-II

3.	a)	A ladder 5m long and of 250N weight is placed against a vertical wall in a position where its inclination to the vertical is 300. A man weighing 800N climbs the ladder. At what position will he induce slipping? The co-efficient of friction for both the contact surfaces of the ladder viz. with the wall and the floor is 0.2.	6 Marks	L4	CO1	PO1 PO2
	b)	A block weighing 100N is resting on a rough plane inclined 20^0 to the horizontal. It is acted upon by a force of 50N directed upward at angle of 140 above the plane. Determine the friction. If the block is about to move up the plane, determine the co-efficient of friction.	6 Marks	L4	CO1	PO1 PO2

(OR)

4.		A person of mass 90 kg is standing on a ladder at point C, shown in Fig.3. The ladder rests on a rough horizontal floor at A and against a smooth vertical wall at B. If the ladder is just on the point of slipping find the coefficient of friction between the ladder and the floor. Neglect the weight of the ladder. Also find the reactions at A and B.	12 Marks	L4	CO1	PO1 PO2

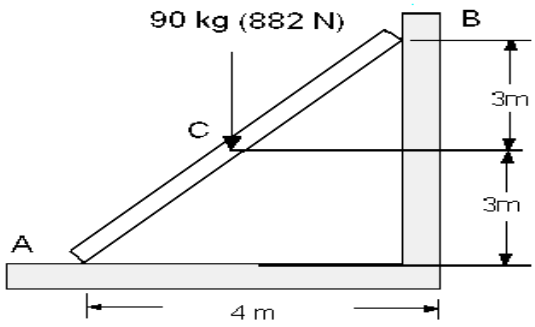


Fig.3

UNIT-III

5.	a)	Discuss the following terms with suitable examples: i) Centroid ii) Centre of mass iii) Centre of gravity iv) Radius of gyration	6 Marks	L4	CO1	PO1 PO2
	b)	Determine the centre of gravity of the plane uniform lamina shown in Fig.4.	6 Marks	L4	CO1	PO1 PO2

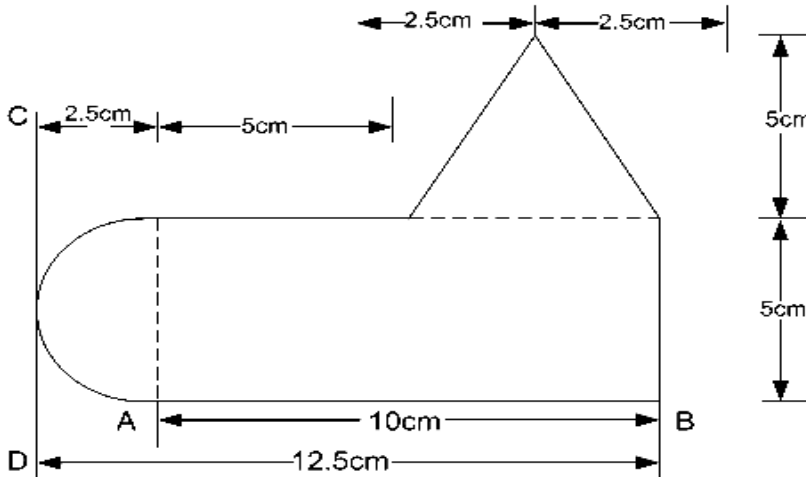


Fig.4

(OR)

6.	a)	State and prove the theorem of perpendicular axis.	6 Marks	L4	CO1	PO1 PO2
	b)	Determine centroid of shaded area as shown in given Fig.5.	6 Marks	L4	CO1	PO1 PO2

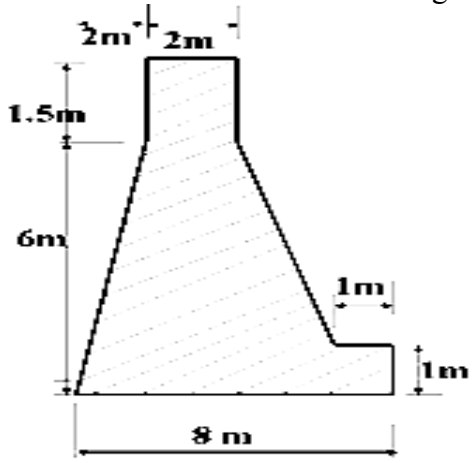


Fig.5

UNIT-IV

7.	a)	Describe the stress strain relationship for mild steel bar.	6 Marks	L4	CO1	PO1 PO2
	b)	A 2m long bar has a uniform diameter of 35mm for a length 1m from one end for the next 0.6m length, the diameter decreases uniformly to d. For the remaining 0.6m length, it has an uniform diameter of 'd' mm. When a load of 120kN is applied, the observed extension is 2.1mm, determine the diameter of the rod. Take E=2 x 10^5 N/mm^2.	6 Marks	L4	CO1	PO1 PO2
		(OR)				
8.		Derive the relationship between Modulus of Elasticity, Modulus of rigidity and Bulk Modulus.	12 Marks	L4	CO1	PO1 PO2

UNIT-V

9.		Derive the change in dimension of thin cylindrical shell due to an internal pressure.	12 Marks	L4	CO1	PO1 PO2
		(OR)				
10.	a)	A pipe of 200mm internal diameter and 50mm thickness carries a fluid at a pressure of 10MN/m^2. Calculate the maximum and minimum intensities of circumferential stress across the section.	6 Marks	L4	CO1	PO1 PO2
	b)	Calculate the thickness of metal necessary for a cylindrical shell of internal diameter 160mm to withstand an internal pressure of 25MN/m^2, if maximum permissible tensile stress is 125MN/m^2.	6 Marks	L6	CO2	PO1 PO2 PO3

CODE No.: 19BT20201 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations March – 2021

ELECTRIC CIRCUITS

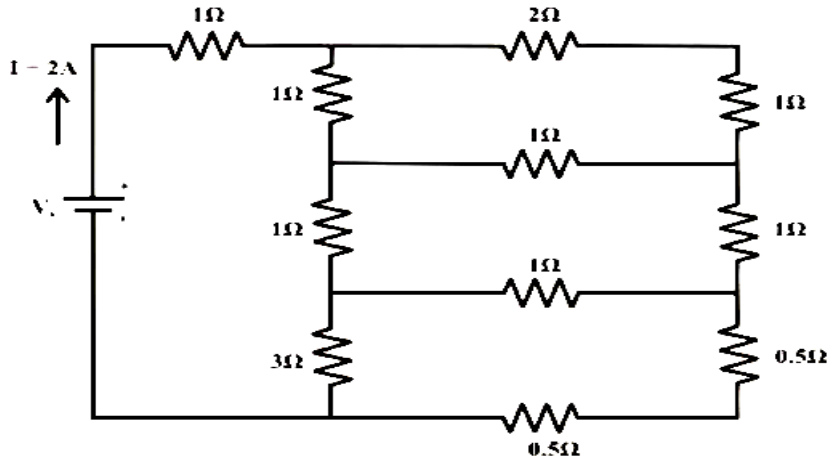
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

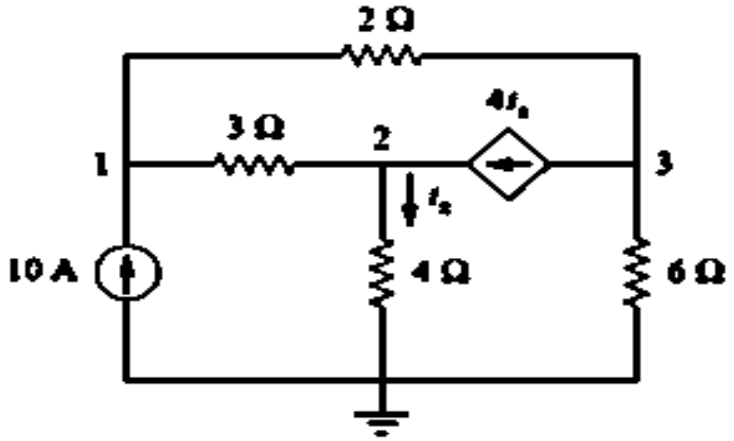
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Find the value of the voltage source V_s that delivers 2 Amps current through the circuit as shown in figure.	6 Marks	L3	CO1	PO2

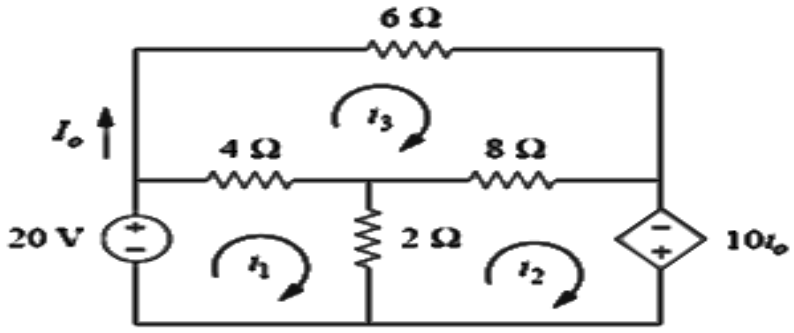


	b)	Find the voltages at the three non reference nodes in the circuit of figure	6 Marks	L4	CO1	PO2

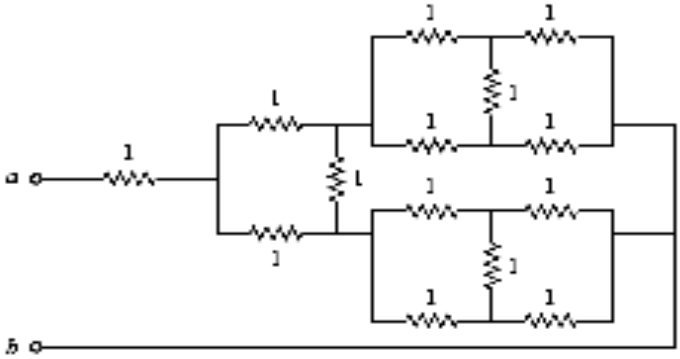


(OR)

2.	a)	Using mesh analysis, find I_0 in the circuit shown in figure.	6 Marks	L4	CO1	PO2

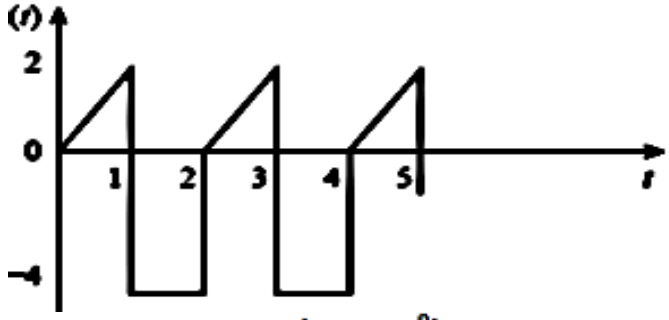


	b)	Find R_{ab} of the network shown in figure, Assume each element is 1Ω.	6 Marks	L3	CO1	PO2

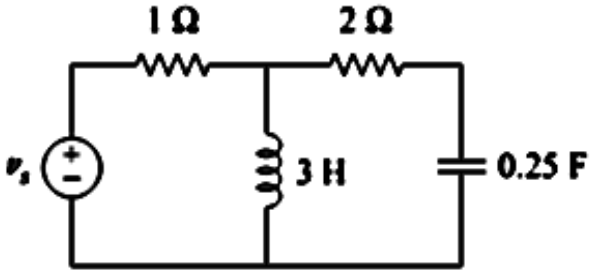


UNIT-II

3.	a)	Determine the form factor of the wave form shown in figure.	6 Marks	L3	CO1	PO2

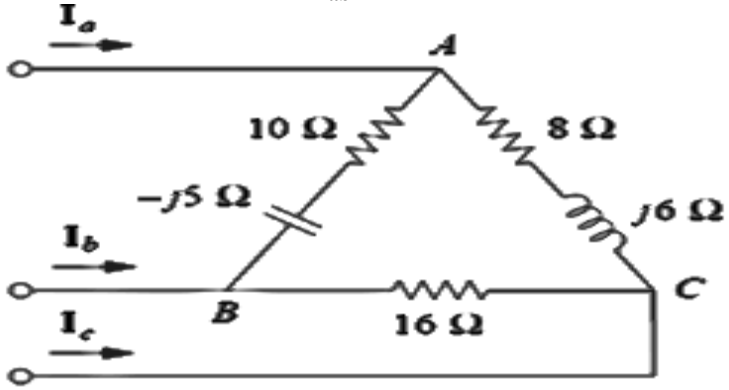


	b)	Assuming that $v_s = 16\cos(2t - 40^0)V$ in the circuit of shown in figure, find the average power delivered to each of the passive elements.	6 Marks	L3	CO2	PO2



(OR)

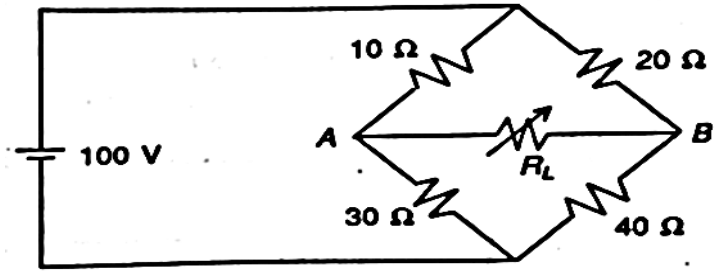
4.	a)	The unbalanced delta-load shown in figure is supplied by balanced line-to-line voltages of 240 V in the positive sequence. Find the line currents. Take V_{ab} as reference.	6 Marks	L3	CO1	PO2



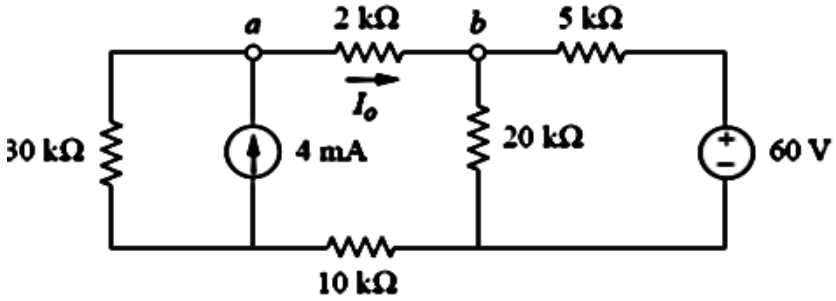
	b)	Explain how a single wattmeter can be used to measure the reactive power with the help of circuit connection and derive the necessary equations.	6 Marks	L2	CO1	PO1

UNIT-III

5.	a)	Determine the maximum power delivered to the load in the circuit shown in figure, using maximum power transfer theorem.	6 Marks	L3	CO1	PO5

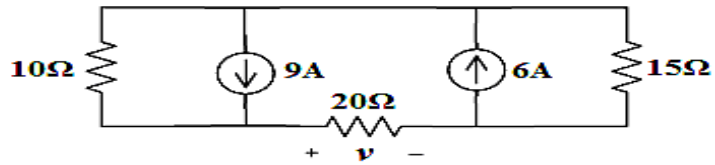


	b)	Consider the circuit in figure, an ammeter with internal resistance R_I is inserted between **a** and **b** to measure I_0. Determine the reading of the ammeter if: R_I=500Ω, 0Ω using Thevenin's theorem.	6 Marks	L4	CO1	PO5

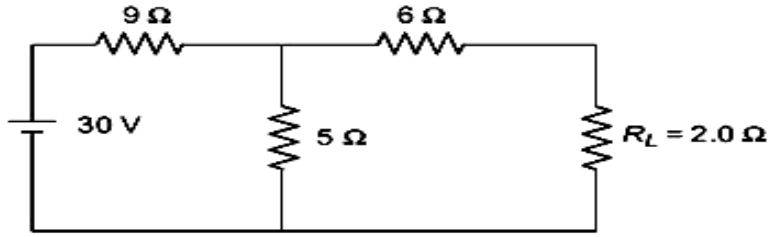


(OR)

6.	a)	In the circuit shown below, find the voltage across the 20Ω resistor using Superposition Theorem.	6 Marks	L3	CO1	PO5

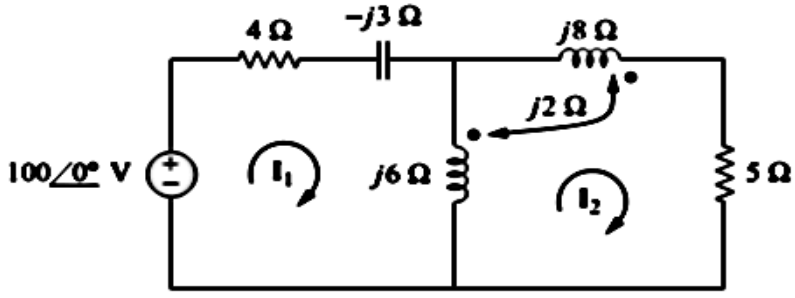


	b)	Calculate the change in current of the network given below using compensation theorem when load resistor changes to 10Ω.	6 Marks	L3	CO1	PO5



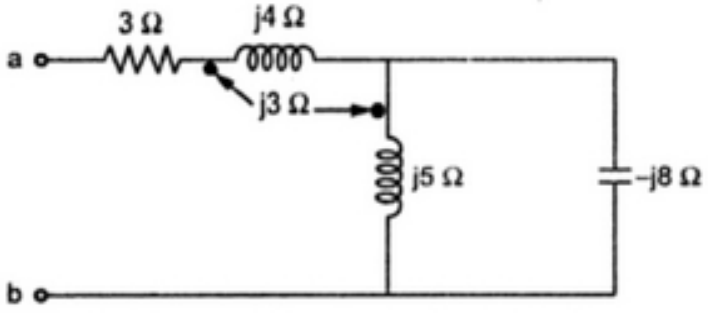
UNIT-IV

7.	a)	Derive the expressions for equivalent inductance of two coils in parallel with i)parallel aiding and ii) parallel opposition	6 Marks	L2	CO1	PO1
	b)	Calculate the mesh currents shown in figure.	6 Marks	L4	CO1	PO2

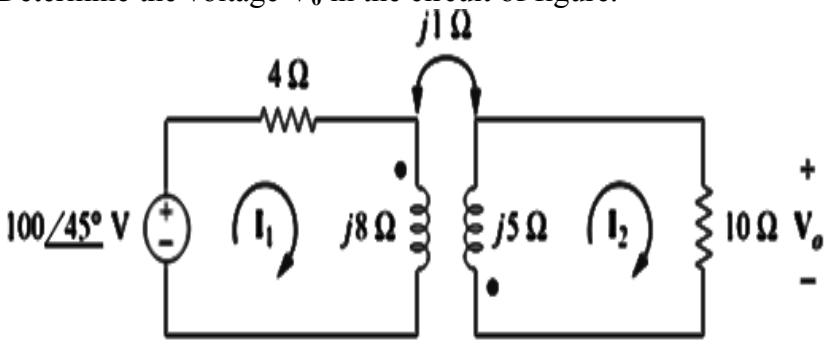


(OR)

8.	a)	For the coupled circuit shown in figure find the input impedance at the terminals a-b	6 Marks	L4	CO1	PO2



	b)	Determine the voltage V_0 in the circuit of figure.	6 Marks	L4	CO1	PO2



UNIT-V

9.	a)	Enumerate the various characteristics that a filter should posses for implementation in signal processing circuits.	6 Marks	L2	CO1	PO1
	b)	Design a π-section band pass filter having cut-off frequencies of 12 kHz and16 kHz for a load having an impedance of 600 Ω.	6 Marks	L4	CO2	PO3

(OR)

10.	a)	Define characteristic impedance and derive the characteristic impedance for a *T* and π networks. Also explain the nature of characteristic impedance in pass band and stop bands.	6 Marks	L3	CO1	PO2
	b)	Design m-derived high pass filter having a design impedance of R_0=500Ω and cut-off frequency of 5 kHz and m = 0.32. Also determine the frequency of infinite attenuation.	6 Marks	L4	CO2	PO3

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations March – 2021

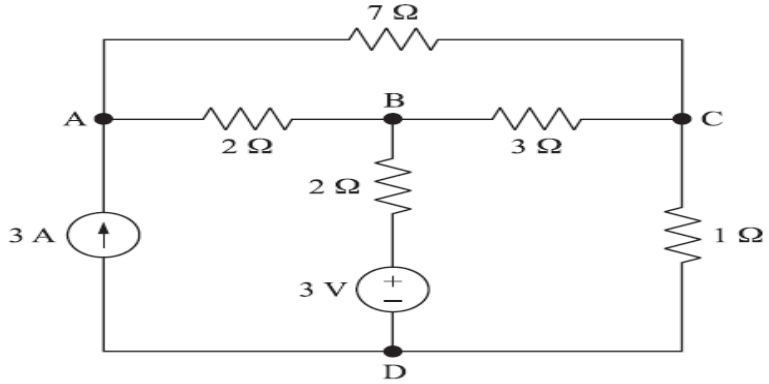
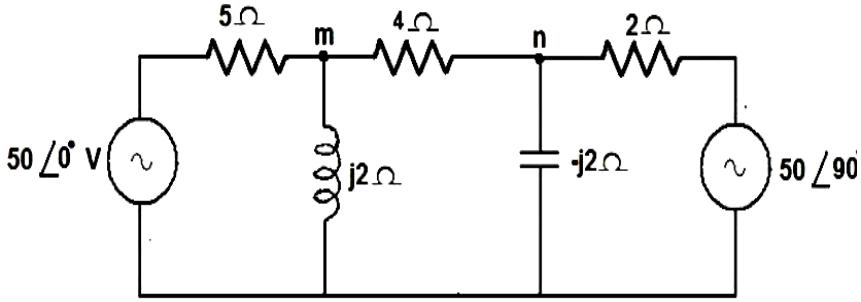
NETWORK ANALYSIS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

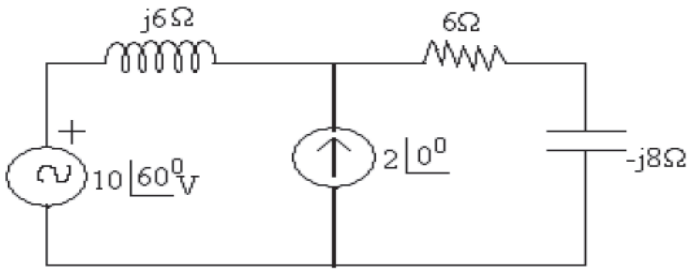
1.		In the circuit shown in figure, write three node equations for nodes A, B, and C with node D as the reference and find the node voltages. 	12 Marks	L4	CO1	PO2
		(OR)				
2.		Use nodal voltage method to find the voltages of nodes 'm' and 'n' and currents through j2Ω and –j2Ω reactance in the network shown below. 	12 Marks	L4	CO1	PO2

UNIT-II

3.	a)	Draw the current, impedance and admittance loci for an RC Series circuit having constant reactance but variable resistance.	6 Marks	L2	CO1	PO1
	b)	A TV tuner consists of a series RLC circuit consists of resistance R = 20, inductance, L = 0.01H and capacitance, C = 0.04 μF. Calculate the frequency at resonance. If a 10 Volts of frequency equal to the frequency of resonance is applied to this circuit, calculate the values of V_C and V_L across C and L respectively. Find the frequencies at which these voltages V_C and V_L are maximum.	6 Marks	L4	CO2	PO6
		(OR)				
4.	a)	Draw the phasor representation of voltage and current for Resistor, inductor and capacitor with sinusoidal excitation.	6 Marks	L2	CO1	PO1
	b)	A supply of 400V, 50Hz is applied to a series RC circuit. Find the value of C if the power absorbed by the resistor to be 500W at 150V. What is the energy stored in a capacitor?	6 Marks	L4	CO1	PO2

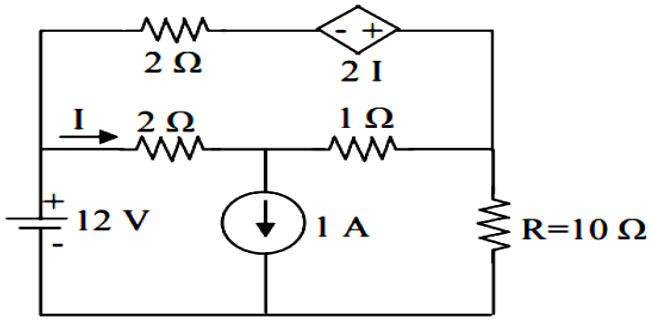
UNIT-III

5.		State Superposition theorem and find the current in the 6Ω resistor using Superposition theorem for the circuit shown below.	12 Marks	L3	CO1	PO5



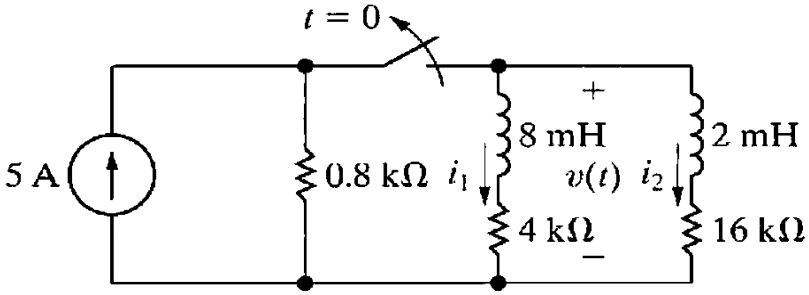
(OR)

6.		For the network shown in figure, determine the current through R=10Ω resistor using Thevenin's theorem and verify the result using Norton's theorem.	12 Marks	L3	CO1	PO2



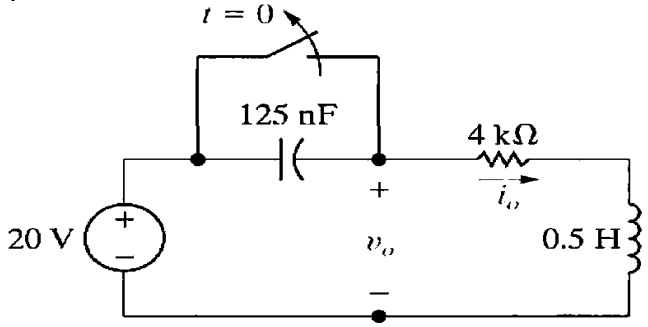
UNIT-IV

7.	a)	Explain the steady state and transient behavior of a capacitor.	4 Marks	L1	CO1	PO1
	b)	The switch in the circuit shown in figure has been closed for a long time. The switch opens at $t = 0$. Compute ***v(t), i_1(t)*** and ***i_2(t)***.	8 Marks	L4	CO1	PO2



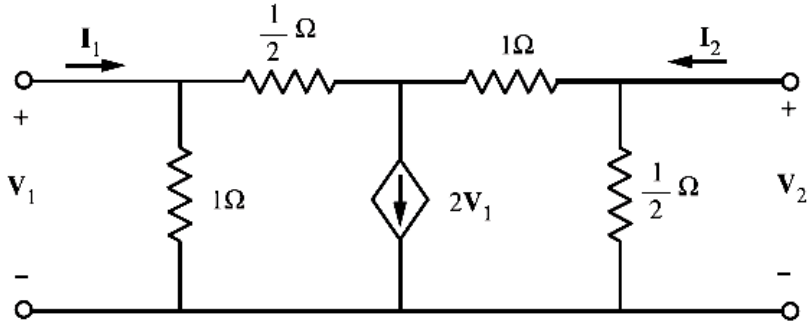
(OR)

8.	a)	Derive the transient response of series R-L-C circuit, with DC excitation using Laplace transform obtain the response for a critically damped case.	4 Marks	L2	CO1	PO5
	b)	The switch in the circuit in figure has been closed for a long time. At $t = 0$, the switch is opened find $v_0(t)$ and $i_0(t)$ for $t > 0$ using Laplace transformation method.	8 Marks	L4	CO2	PO5



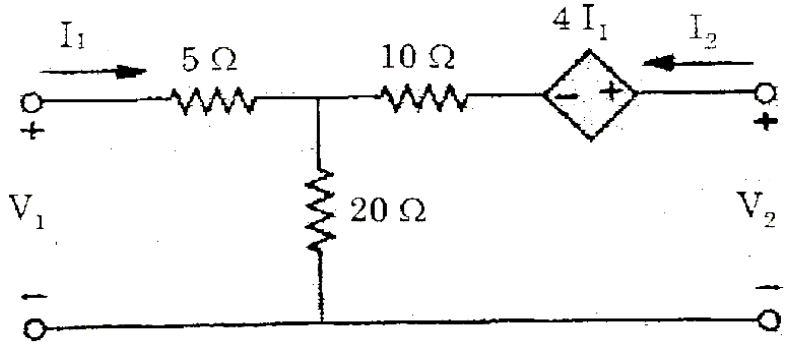
UNIT-V

9.	a)	Define reciprocity and symmetry for a generalized two port network and derive the conditions for reciprocity and symmetry in terms of Y parameters.	6 Marks	L1	CO1	PO1
	b)	Find the y parameters for the two-port network shown in figure. Invistigate whether the netwok is symmetrical and reciprocal.	6 Marks	L4	CO1	PO4



(OR)

10.	a)	The Z parameters of a two port network are Z_{11}=6Ω, Z_{22}=4Ω, Z_{12} = Z_{21} = 3Ω. Compute ABCD Parameters and write the describing equations.	6 Marks	L4	CO1	PO2
	b)	Determine the impedance (Z) parameter of the given two port network shown in fig	6 Marks	L4	CO1	PO4



CODE No.: 19BT20301 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations March – 2021

BASIC ENGINEERING MECHANICS

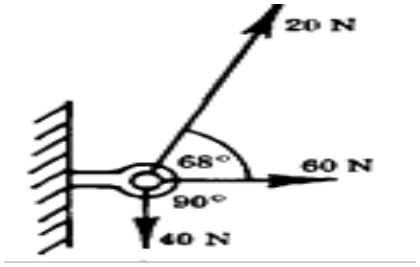
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

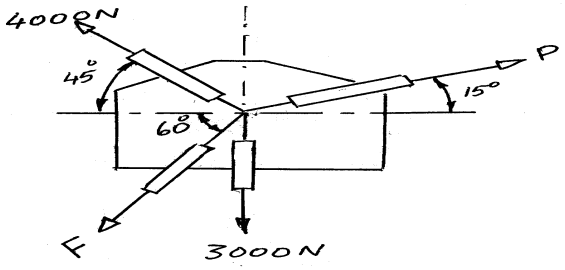
UNIT-I

1.	The resultant of three forces is 60N as shown in figure. Two of the three forces are also shown as 20N and 40 N. Determine the third force.	12 Marks	L2	CO1	PO1 PO2



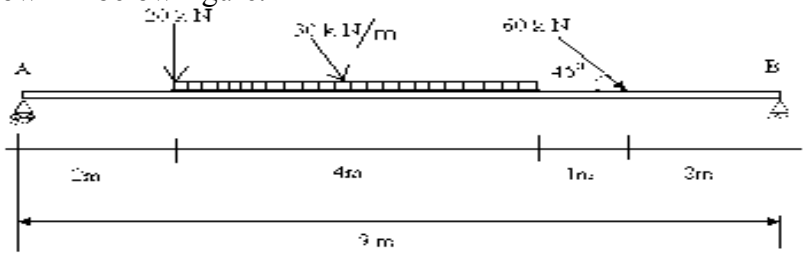
(OR)

2.	The forces on the gusset plate of a joint in a bridge truss act as shown in figure. Determine the magnitudes of the two forces P and F to maintain equilibrium of the joint.	12 Marks	L2	CO1	PO1 PO2



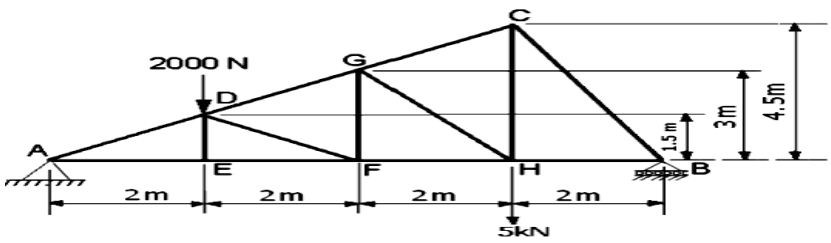
UNIT-II

3.	Find the reactions at the supports A and B of the loaded beam shown in below figure.	12 Marks	L2	CO1	PO1 PO2

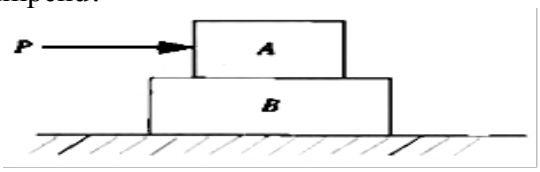
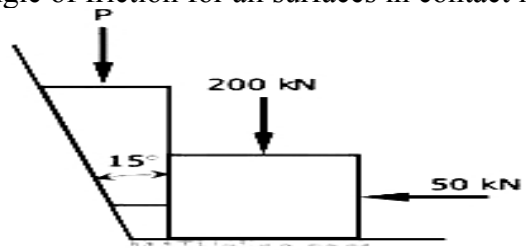


(OR)

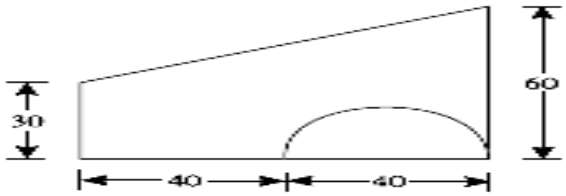
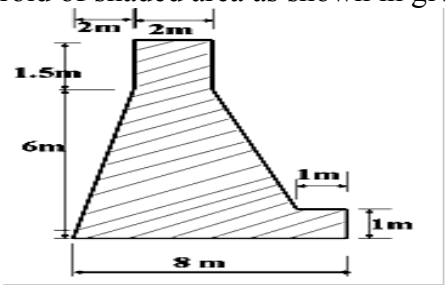
4.	Calculate the forces included in the members of the pin-jointed truss shown in figure. Show the values on a neat diagram of the truss.	12 Marks	L2	CO1	PO1 PO2



UNIT-III

5.		The coefficient of friction between a copper block A and an aluminum block B is 0.3, and between the block B and the floor is 0.2. The weight of block A is 30 N and of block B is 20 N as shown in given figure. What force P will cause the motion of block A to impend? 	12 Marks	L2	CO1	PO1 PO2
		(OR)				
6.		Determine the force P required to start the wedge shown in figure. The angle of friction for all surfaces in contact is 15°. 	12 Marks	L2	CO1	PO1 PO2

UNIT-IV

7.		A semicircular area is removed from a trapezium as shown in figure (dimensions in mm). Determine the centroid of the remaining area. 	12 Marks	L3	CO2	PO1 PO2
		(OR)				
8.	a)	Define Centre of Gravity and Centre of mass.	6 Marks	L3	CO2	PO1
	b)	Determine centroid of shaded area as shown in given figure. 	6 Marks	L3	CO2	PO1 PO2

UNIT-V

9.	a)	An elevator weighing 5000N is ascending with an acceleration of 3m/s². During this ascent, its operator whose weight is 700N is standing on the weighing pan placed on the floor. What is the weighing pan reading? What will be the total tension in the cables of elevator during this motion?	6 Marks	L2	CO3	PO1 PO2
	b)	Explain D'Alembert's principle with neat example.	6 Marks	L2	CO3	PO1
		(OR)				
10.	a)	Compare and contrast between Simple and Compound pendulums.	6 Marks	L2	CO4	PO1
	b)	A Weight of 50N is suspended from a spring, vibrates vertically with a frequency of 1 Hertz and amplitude of 7.5cm. Find the stiffness of spring and maximum velocity.	6 Marks	L2	CO4	PO1 PO2

❀ ❀ ❀

CODE No.: 19BT20302 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations March - 2021

MATERIAL SCIENCE AND ENGINEERING

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Discuss the primary and secondary bonding in materials.	6 Marks	L1	CO1	PO1
	b)	Explain interstitial and vacancy diffusions.	6 Marks	L2	CO1	PO2
		(OR)				
2.		Explain Iron-Iron carbide phase diagram in detail.	12 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	Write short notes on Flame and Induction Hardening.	6 Marks	L1	CO1	PO1 PO7
	b)	Define annealing and recall the types of annealing.	6 Marks	L1	CO1	PO1 PO7
		(OR)				
4.		Describe TTT and CCT curves in detail.	12 Marks	L1	CO1	PO3
		UNIT-III				
5.	a)	Differentiate carbon steels and alloy steels.	6 Marks	L2	CO2	PO3
	b)	Write a note on Hadfield manganese steels and Stainless steels.	6 Marks	L1	CO2	PO2
		(OR)				
6.		Draw the microstructures of Grey cast iron and White cast iron; also mention its composition, properties and applications.	12 Marks	L3	CO2	PO4
		UNIT-IV				
7.	a)	Compare brass and bronze materials.	6 Marks	L2	CO2	PO3
	b)	List the properties and applications of copper.	6 Marks	L1	CO2	PO1
		(OR)				
8.		What is aluminum? Explain the types, properties and uses of aluminum alloys in detail.	12 Marks	L2	CO2	PO2
		UNIT-V				
9.	a)	Write a brief note on Metal-Matrix Composites (MMCs) and Ceramic-Matrix Composites (CMCs).	6 Marks	L1	CO2	PO2 PO7
	b)	Discuss on the characteristics and classification of polymers.	6 Marks	L1	CO2	PO3
		(OR)				
10.		Define polymerization reaction and explain the types of polymerization reaction in detail.	12 Marks	L2	CO2	PO1 PO7

CODE No.: 19BT20501 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations March – 2021

DIGITAL LOGIC DESIGN

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Obtain complement of the Boolean Expression A′ B + A′BC′ + A′BCD.	6 Marks	L3	CO1	PO2
	b)	Convert the following numbers with the indicated bases to decimal: i) $(435)_8$ ii) $(345)_6$ iii) $(10110110)_2$	6 Marks	L3	CO1	PO1
		(OR)				
2.	a)	Each of the following arithmetic operations is correct in at least one number system. Determine the bases in each operation: i) 41/3 = 13 ii) 23 + 44 + 14 + 32 = 223	6 Marks	L3	CO1	PO1
	b)	Prove the following Boolean theorems: i) AB+A′C = (A+C)(A′+B) . ii) AB+A′C+BC = AB+A′C.	6 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Simplify the following Boolean function using K-Map method. F (w, x, y, z) = Σ (0, 2, 4, 5, 6, 7, 8, 10, 13, 15).	6 Marks	L4	CO1	PO2
	b)	Implement AND, OR, NOT gates using Universal gates.	6 Marks	L3	CO1	PO2
		(OR)				
4.	a)	Find the minterms of the following Boolean expressions by first plotting each function ina map: $xy + yz + xy'z$.	6 Marks	L4	CO1	PO2
	b)	Minimize the expression using K-map and realize using only NOR gates. F (A, B, C, D) = Π (1, 4, 5, 11, 12, 14) and don't care conditions d (A, B, C, D) = (6, 7, 15)	6 Marks	L4	CO1	PO3

UNIT-III

5.	a)	With the help of a circuit diagram, explain the operation of series full adder and compare its performance with parallel adder.	6 Marks	L4	CO2	PO2
	b)	What is a multiplexer? Use a 4:1 multiplexer and a minimum number of external gates to realize the following Boolean function. F (w, x, y, z) = ∑ m (3, 4, 5, 7, 10, 14) + ∑ d (1, 6, 15)	6 Marks	L4	CO2	PO5
		(OR)				
6.	a)	Realize a full subtract or using MUX.	4 Marks	L4	CO2	PO4
	b)	Draw and explain 4-bit shift register with an example.	8 Marks	L2	CO2	PO1

UNIT-IV

7.	a)	Explain about the realization of SR flip-flop, JK flip-flop using D flip-flop.	6 Marks	L2	CO2	PO1
	b)	Design a 2-bit x 3-bit Binary Multiplier.	6 Marks	L4	CO2	PO3
		(OR)				

8.	a)	Design decade Johnson counter and explain its operation.	6 Marks	L4	CO2	PO3
	b)	Define excitation table. Explain D flip-flop and obtain the state equation, the state diagram, state table and excitation table of the same.	6 Marks	L2	CO2	PO1

UNIT-V

9.		A combinational circuit is defined by the functions F_1 (A, B, C) = Σ(3, 5, 6, 7) F_2 (A, B, C) = Σ(0, 2, 4, 7) Implement the circuit with a PLA having 3-inputs, four product terms and two outputs.	12 Marks	L4	CO2	PO4

(OR)

10	a)	Implement F (a, b, c, d) = Σ m(0, 1, 2, 3, 6, 9, 11) using PAL.	9 Marks	L4	CO2	PO4
.	b)	Write short notes on combinational PLDs.	3 Marks	L2	CO2	PO1

CODE No.: 19BT21501 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations March - 2021

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Differentiate between Procedural Oriented and Object Oriented Languages.	6 Marks	L2	CO1	PO1
	b)	Write about Garbage Collection in Java.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Illustrate the usage of this keyword using an example program.	6 Marks	L2	CO1	PO1
	b)	Explain about: i) class ii) object iii) constructor.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Develop a java program to implement Towers of Hanoi problem.	6 Marks	L3	CO1	PO3
	b)	Analyze the concept of constructor overloading with an example program.	6 Marks	L2	CO2	PO2
		(OR)				
4.	a)	List and explain any four operators in java.	6 Marks	L1	CO1	PO1
	b)	Give the purpose of using the final keyword in java.	6 Marks	L1	CO1	PO1
		UNIT-III				
5.	a)	"Java supports reusability". Justify the statement.	6 Marks	L5	CO2	PO1
	b)	Write the process of creating and accessing a package.	6 Marks	L1	CO2	PO1
		(OR)				
6.	a)	Design a program to demonstrate multiple inheritance in java.	6 Marks	L3	CO2	PO4
	b)	Explain the following : i) Abstract class. ii) Final keyword with inheritance.	6 Marks	L1	CO2	PO1
		UNIT-IV				
7.	a)	Develop a java program for producer consumer problem to illustrate the concept of multithreading.	6 Marks	L3	CO2	PO4
	b)	What is Java Collections Framework? List out some benefits of Collection framework.	6 Marks	L1	CO2	PO1
		(OR)				
8.	a)	Difference between Thread and Process in Java. How to implement Thread in Java?	6 Marks	L2	CO2	PO2
	b)	Develop a java program to read 20 marks and store them in an array. Define your own exception named wrong mark exception. Throw and catch this type of exception when a mark is (<0 and >100).	6 Marks	L3	CO2	PO3
		UNIT-V				
9.	a)	What is an Event? Explain the role of Event handler in AWT.	6 Marks	L1	CO3	PO1
	b)	Design and develop an Applet to receive the value of the parameter message from the html file and display it on the webpage.	6 Marks	L3	CO3	PO5
		(OR)				
10.	a)	Construct an anonymous inner class for handling mouse entered events into an Applet.	6 Marks	L3	CO3	PO3
	b)	List and explain any three Swing GUI components.	6 Marks	L2	CO3	PO1

CODE No.: 20BT1BS02 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-20) Supplementary Examinations March – 2022

ENGINEERING CHEMISTRY

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Science)]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	What are zeolites? Explain the zeolite process. List the advantages and disadvantages of zeolite process.	10 Marks	L2	CO1	PO1
	b)	"Reverse osmosis is advantageous over ion-exchange process" for desalination of brackish water. Justify the statement.	4 Marks	L3	CO1	PO1
		(OR)				
2.	a)	What are boiler troubles? Why they are caused? How the boiler corrosion can be avoided?	8 Marks	L1	CO1	PO1
	b)	Define potable water. List any six WHO and BIS standards of portable water.	6 Marks	L1	CO1	PO6
		UNIT-II				
3.	a)	Derive Schrodinger wave equation and explain the significance of ψ and ψ^2.	7 Marks	L3	CO2	PO1
	b)	Construct molecular energy level diagram of O_2 molecule and predict its magnetic behavior and bond order.	7 Marks	L3	CO2	PO2
		(OR)				
4.		Explain the π-molecular orbital diagram of benzene and 1, 3-butadiene.	14 Marks	L2	CO2	PO1
		UNIT-III				
5.	a)	Discuss the construction and working of Li-ion batteries with chemical reactions occurring during charging and discharging process and their applications.	8 Marks	L2	CO3	PO1
	b)	Define Reference electrode and write a brief note on Calomel electrode.	6 Marks	L1	CO3	PO1
		(OR)				
6.	a)	Explain how Impressed currant cathodic protection can provide protection against corrosion.	7 Marks	BL2	CO3	PO2
	b)	Discuss about galvanic corrosion with examples.	7 Marks	BL2	CO3	PO1
		UNIT-IV				
7.	a)	Write a short note on the following: i) Batho chromic shift. ii) Chromophore.	8 Marks	L1	CO4	PO1
	b)	Explain the basic principle of UV-Visible spectroscopy. What are the possible electronic transitions?	6 Marks	L2	CO4	PO1
		(OR)				
8.		Discuss the working principle and applications of Transmission Electron Microscope. List the differences between SEM and TEM.	14 Marks	L2	CO4	PO1

UNIT-V

9.	a)	What are the advantages of catalytic cracking process? Describe the fixed-bed catalytic cracking process with neat diagram.	8 Marks	L2	CO5	PO1
	b)	Calculate the HCV and NCV of coal sample containing 85% of carbon, 1.5% of sulphur, 0.6% of nitrogen, 8% of hydrogen and 8.4% of oxygen.	6 Marks	L3	CO5	PO2
		(OR)				
10.	a)	What are the different types of mechanisms of lubrication? Explain mechanism of thick and thin film lubrication.	8 Marks	L2	CO5	PO1
	b)	List out different functions of lubricants.	6 Marks	L1	CO5	PO1

CODE No.: 20BT1BS03 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-20) Supplementary Examinations March – 2022

ENGINEERING PHYSICS

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering, Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the necessary theory to determine the wavelength of a light using Newton's ring method.	10 Marks	L2	CO1	PO2
	b)	In a Newton's rings experiment the diameter of the 8^{th} ring was 0.35cm and the diameter of 18^{th} ring was 0.65cm. If the wavelength of light used is 6000 **Å** then find the radius of curvature of the plano-convex lens.	4 Marks	L1	CO1	PO2
		(OR)				
2.	a)	Describe the construction and working of a Nicol's Prism.	10 Marks	L2	CO1	PO2
	b)	The refractive indices of mica for ordinary and extraordinary rays are 1.586 and 1.592 with a wavelength of 5460 **Å**. Predict the thickness of mica sheet to act as a quarter wave plate.	4 Marks	L3	CO1	PO2
		UNIT-II				
3.	a)	Outline the divergence and curl of electric and magnetic fields.	6 Marks	L2	CO2	PO1
	b)	Identify the four Maxwell's field equations along with their physical significance.	8 Marks	L3	CO2	PO2
		(OR)				
4.	a)	Using a block diagram, explain the optical fibre communication system.	10 Marks	L2	CO2	PO2
	b)	Outline the various applications of optical fibres.	4 Marks	L2	CO2	PO1
		UNIT-III				
5.	a)	Recall the intrinsic and extrinsic semiconductors.	4 Marks	L1	CO3	PO1
	b)	Derive an expression for density of electrons in intrinsic semiconductors.	10 Marks	L3	CO3	PO2
		(OR)				
6.	a)	State Hall effect. Derive an expression for Hall coefficient. Mention its applications.	10 Marks	L3	CO3	PO2
	b)	Differentiate the direct and indirect band gap semiconductors.	4 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	Develop the theory and expression for internal field experienced by an atom in a dielectric material.	10 Marks	L3	CO4	PO2
	b)	List any four applications of dielectric materials in various fields.	4 Marks	L1	CO4	PO1
		(OR)				
8.	a)	Extend the theory of hysteresis in ferro-magnetic materials.	7 Marks	L2	CO4	PO1
	b)	Distinguish between soft and hard magnetic materials.	7 Marks	L4	CO4	PO1
		UNIT-V				
9.	a)	Explain Meissner effect. How it is used to classify Type-I and Type-II superconductors?	10 Marks	L2	CO5	PO2
	b)	List any four applications of superconductors.	4 Marks	L1	CO5	PO1
		(OR)				
10.	a)	Discuss the physical, optical and magnetic properties of nonmaterial's.	7 Marks	L2	CO5	PO1
	b)	Describe the pulsed laser deposition technique to synthesize nonmaterial's.	7 Marks	L2	CO5	PO2

CODE No.: 20BT1BS04 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-20) Supplementary Examinations March – 2022

APPLIED PHYSICS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Classify the optical fibresbased on refractive index profile and modes of propagation with neat sketch.	10 Marks	L3	CO1	PO1
	b)	Calculate the angle of acceptance and critical angle of a given optical fiber whose refractive indices of core and cladding regions are 1.565 and 1.492 respectively.	4 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Discuss the double crucible technique to fabricate optical fiber.	8 Marks	L2	CO1	PO1
	b)	What is a sensor? Explain the constructions of displacement sensor.	6 Marks	L3	CO1	PO1
		UNIT-II				
3.	a)	Explain the following terms: Reverberation, Reverberation time and Absorption coefficient.	6 Marks	L2	CO2	PO1
	b)	List the requirements of an acoustic good hall. Explain how these requirements can be achieved.	8 Marks	L1	CO2	PO2
		(OR)				
4.	a)	Define ultrasonic sounds. Describe the piezoelectric method for their production.	10 Marks	L2	CO2	PO1
	b)	Recall the various methods to identify the ultrasonic sounds.	4 Marks	L3	CO2	PO1
		UNIT-III				
5.	a)	Sketch the displacement-time curve, velocity-time curve and acceleration-time curve of a body in rectilinear motion.	8 Marks	L2	CO3	PO1
	b)	Distinguish between rectilinear motion and curvilinear motion of a body.	6 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Derive an expression for work-energy theorem for translation body.	8 Marks	L1	CO3	PO1
	b)	Summarize the following: Work, Power and energy with units.	6 Marks	L2	CO3	PO2
		UNIT-IV				
7.	a)	Discuss the rectilinear motion of heat along a uniform bar.	7 Marks	L2	CO4	PO1
	b)	Elaborate the terms conduction, convection and radiation.	7 Marks	L3	CO4	PO1
		(OR)				
8.	a)	Define thermal conductivity and derive an expression for coefficient of thermal conductivity.	7 Marks	L2	CO4	PO1
	b)	Derive the equation for the heat conduction through compound media in series combination.	7 Marks	L3	CO4	PO2
		UNIT-V				
9.	a)	Explain the preparation of metallic glasses by Radio Frequency sputtering technique.	10 Marks	L2	CO5	PO1
	b)	Write various applications of shape memory alloys.	4 Marks	L3	CO5	PO1
		(OR)				
10.	a)	What are the shape memory alloys and outline the properties of NiTi alloy.	7 Marks	L2	CO5	PO1
	b)	List the different types of composites and give their applications.	7 Marks	L1	CO5	PO1

CODE No.: 20BT1HS01 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-20) Supplementary Examinations March – 2022

COMMUNICATIVE ENGLISH

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Discuss the role of Nonverbal communication in present generation.	7 Marks	L2	CO1	PO1
	b)	Explain different types of listening based on purpose and output.	7 Marks	L2	CO2	PO2
		(OR)				
2.		Discuss the methods of conveying messages verbally.	14 Marks	L 2	CO1	PO1
		UNIT-II				
3.		Analyze the correlation between listening and taking notes. Give a few tips for effective note-taking.	14 Marks	L4	CO2	PO2
		(OR)				
4.	a)	"Ears get better results than mouth." Discuss.	7 Marks	L2	CO2	PO2
	b)	The people around you probably feel that you don't pay attention to them when they talk to you, and they may feel that you don't understand them. Illustrate.	7 Marks	L2	CO2	PO2
		UNIT-III				
5.	a)	How do you deal with stage fright and narrate a personal experience?	7 Marks	L2	CO2	PO1
	b)	Which is more important – Content or Delivery? Differentiate.	7 Marks	L2	CO2	PO1
		(OR)				
6.		Even if you have good vocabulary and grammar, you are still in a cuff to speak in public. Discuss.	14 Marks	L2	CO2	PO2
		UNIT-IV				
7.		What is your reading comfort zone and how do you use SQ3R Reading technique?	14 Marks	L3	CO3	PO5
		(OR)				
8.	a)	Illustrate what logics would you suggest to identify the Topic Sentence in a paragraph.	7 Marks	L3	CO3	PO5
	b)	What skills are involved in critical reading? Explain briefly.	7 Marks	L2	CO3	PO5
		UNIT-V				
9.		"Technical writing creates bias based on race, nationality, culture or gender." Illustrate.	14 Marks	L2	CO3	PO2
		(OR)				
10.	a)	How can you develop your technical writing skills?	7 Marks	L1	CO3	PO1
	b)	What is Plagiarism? Give some suggestions to avoid it.	7 Marks	L1	CO3	PO1

❀ ❀ ❀

CODE No.: 20BT2BS01 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-20) Supplementary Examinations March – 2022

TRANSFORMATION TECHNIQUES AND LINEAR ALGEBRA

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Science), Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Examine, whether the function $f(x)=\|x\|\ in -\pi<x<\pi$ is even or odd and obtain Fourier series for the same.	5 Marks	L4	CO1	PO2
	b)	Find the Fourier transform of $f(x)=\begin{cases} a-\|x\|, & \|x\|<a \\ 0, & \|x\|>a>0 \end{cases}$ and hence find the value of the integral $\int_0^\infty \left(\frac{\sin t}{t}\right)^2 dt.$	9 Marks	L1	CO1	PO1

(OR)

2.	a)	Establish Fourier cosine series for the function $f(x)=\begin{cases} \cos x, & 0<x<\frac{\pi}{2} \\ 0, & \frac{\pi}{2}<x<\pi \end{cases}$.	7 Marks	L1	CO1	PO1
	b)	Find the Fourier cosine transform of $f(x)=e^{-x^2}$.	7 Marks	L1	CO1	PO1

UNIT-II

3.	a)	Applying Laplace transform, evaluate $\int_0^\infty \frac{e^{-t}-e^{-2t}}{t}\,dt.$	7 Marks	L3	CO2	PO2
	b)	Find $f(x)=e^{-x^2}$.	7 Marks	L1	CO2	PO1

(OR)

4.	a)	Determine Laplace transform of $t\sin at$ by using transformation of derivatives.	7 Marks	L3	CO2	PO2
	b)	Find the Laplace transform of $g(t)$, where $g(t)=\begin{cases} \cos\left(t-\frac{\pi}{3}\right), & if\ t>\frac{\pi}{3} \\ 0, & if\ t<\frac{\pi}{3} \end{cases}$.	7 Marks	L1	CO2	PO1

UNIT-III

5.		Solve the differential equation $(D^2+1)y=\sin t \sin 2t$, given that $y(0)=1,\ y'(0)=0$ using Laplace transforms.	14 Marks	L3	CO2	PO2

(OR)

6.	a)	Find $L^{-1}\left\{\frac{1}{(s^2+a^2)^2}\right\}$.	7 Marks	L1	CO2	PO1
	b)	Applying convolution theorem, evaluate $L^{-1}\left\{\frac{s^2}{(s^2+a^2)^2}\right\}$.	7 Marks	L5	CO2	PO2

UNIT-IV

7.		Identify the values of λ for which the system of equations $x+y+z=1,\ x+2y+4z=\lambda,\ x+4y+10z=\lambda^2$ is consistent and solve them completely.	14 Marks	L3	CO3	PO2

(OR)

8.	a)	Determine the characteristic roots of A and A^{-1} where $A=\begin{pmatrix}-2 & 2 & -3\\ 2 & 1 & -6\\ -1 & -2 & 0\end{pmatrix}$.	7 Marks	L3	CO3	PO2
	b)	Find the rank of the matrix $A=\begin{bmatrix}2 & 1 & 3 & 5\\ 4 & 2 & 1 & 3\\ 8 & 4 & 7 & 13\\ 8 & 4 & -3 & -1\end{bmatrix}$ by reducing it into echelon form.	7 Marks	L1	CO3	PO2

UNIT-V

9.	a)	Examine, whether the vectors $\begin{bmatrix}1\\-2\\1\end{bmatrix}, \begin{bmatrix}2\\1\\-1\end{bmatrix}$ *and* $\begin{bmatrix}7\\-4\\1\end{bmatrix}$ are linearly independent or not.	5 Marks	L4	CO2	PO2
	b)	Find the rank and nullity of the linear transformation $T:W\to P_2$ *by* $T\begin{bmatrix}a & b\\ b & c\end{bmatrix}=(a-b)+(b-c)x+(c-a)x^2$, where W is the vector space of all 2 x 2 symmetric matrices and P_2 be the vector space of all polynomials of degree at most 2 over real numbers.	9 Marks	L1	CO2	PO1

(OR)

10.	a)	Show that the set $\{(2,1,4),(1,-1,2),(3,1,-2)\}$ forms a basis of $R^3(R)$.	5 Marks	L2	CO4	PO1
	b)	Let P_n be the vector space of all polynomials of degree at most *n* over R. Determine the matrix of the linear transformation $T:P_2\to P_3$ defined by $T(p(x))=p(2x-1)$ with respect to the basis $B=\{1,x,x^2\}$, *where* $p(x)\in P_2$.	9 Marks	L3	CO4	PO2

CODE No.: 20BT10201 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-20) Supplementary Examinations March – 2022

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

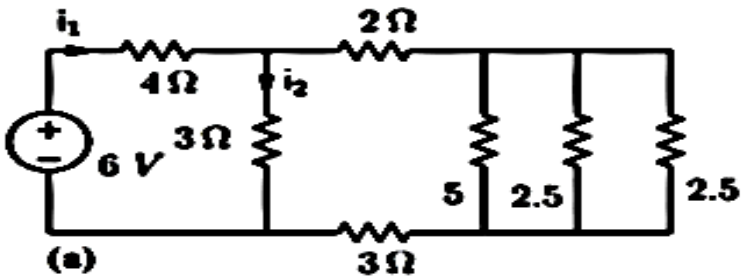
[Civil Engineering, Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

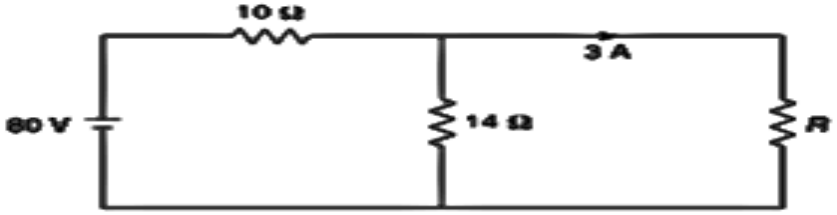
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Determine the current flowing through 5Ω resistor shown in figure.	7 Marks	L3	CO1	PO2

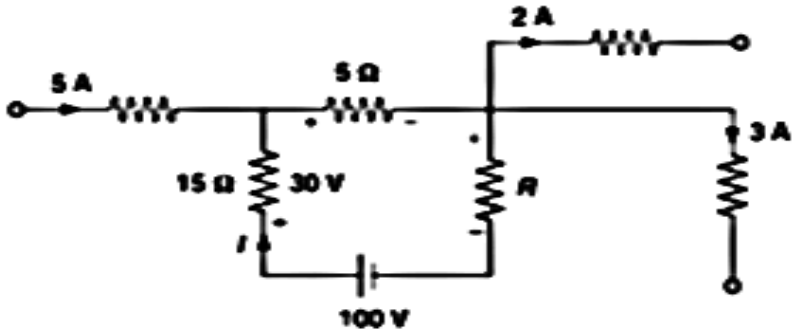


	b)	Determine the current delivered by the source and value of unknown resistance *R* for the given network.	7 Marks	L3	CO1	PO2

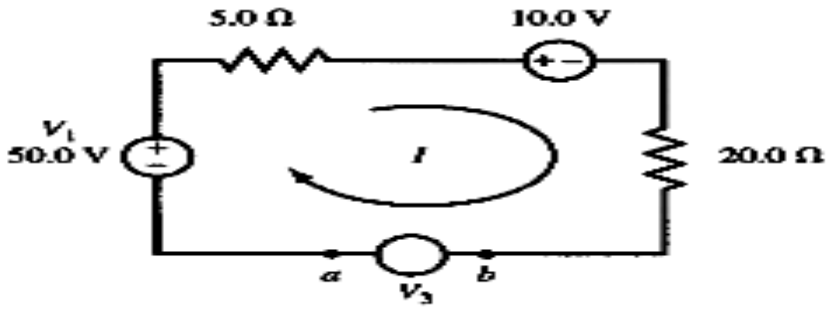


(OR)

2.	a)	The voltage drop across 15 Ω resistor is 30 V, having the polarity indicated. Find the value of *R* for the given circuit.	7 Marks	L3	CO1	PO2



	b)	Find V_3 and its polarity if the current *I* in the circuit of Fig is 0.40 A.	7 Marks	L3	CO1	PO2



UNIT-II

3.	a)	With the help of neat sketch, describe the operation of clean environmental method for sustainable energy generations also mention its advantage and disadvantages.	11 Marks	L2	CO2	PO7
	b)	Explain the objective and significance of BEE standard and norms which needs to be followed while rating an appliance.	3 Marks	L2	CO2	PO8
		(OR)				
4.	a)	Mention the difference between fuse and circuit breaker.	4 Marks	L2	CO2	PO2
	b)	With neat sketch, explain the operation of coal fired power plant. Also, discuss its impact on environment.	7 Marks	L2	CO2	PO7
	c)	Define Energy Efficiency Ratio. Also, mention the electrical products listed under mandatory labeling.	3 Marks	L2	CO2	PO8

UNIT-III

5.	a)	Explain the constructional features of a three phase induction motor.	7 Marks	L2	CO3	PO1
	b)	Derive the expression for EMF equation of single phase transformer.	7 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Explain the constructional details and working of single phase resistor start induction motor.	7 Marks	L2	CO3	PO1
	b)	Explain the constructional details of permanent magnet DC motor and mention any one application.	7 Marks	L2	CO3	PO1

UNIT-IV

7.	a)	Sketch the VI characteristics of PN junction diode.	7 Marks	L2	CO4	PO1
	b)	Explain how the zener diode acts as a voltage regulator.	7 Marks	L1	CO4	PO1
		(OR)				
8.	a)	With the help of circuit diagram, explain the operation of half wave rectifier.	7 Marks	L2	CO4	PO1
	b)	Explain the input and output characteristics of a transistor in Common Base configurations.	7 Marks	L2	CO4	PO1

UNIT-V

9.	a)	Derive the expression for output voltage in inverting and non-inverting amplifier.	7 Marks	L2	CO4	PO1
	b)	Construct a circuit to realize $V_{out} = 10V_1 + 20V_2 - 5V_3$ using Op-Amp.	7 Marks	L3	CO4	PO2
		(OR)				
10.	a)	Examine and derive an expression for V_0 of the integrator circuit by using Op-Amp.	7 Marks	L2	CO4	PO1
	b)	Draw the circuit symbol of Op-Amp. Explain what is meant by inverting input and non-inverting input.	7 Marks	L2	CO4	PO1

CODE No.: 20BT20201 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-20) Supplementary Examinations March – 2022

ELECTRICAL CIRCUITS

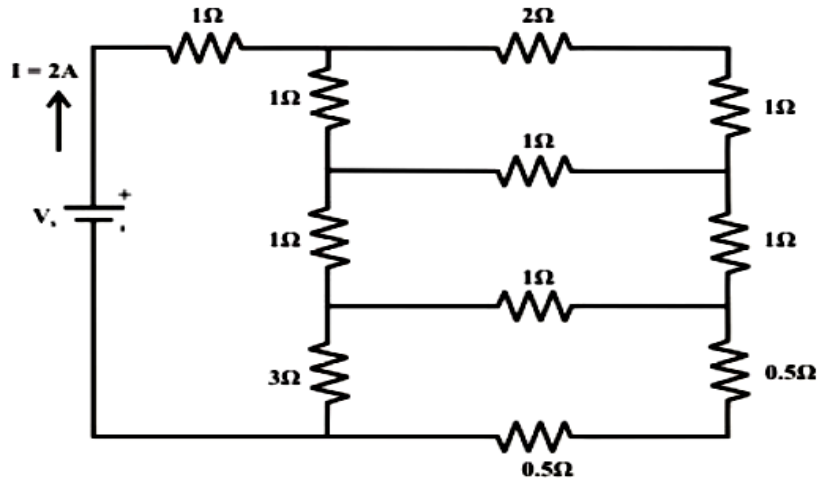
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

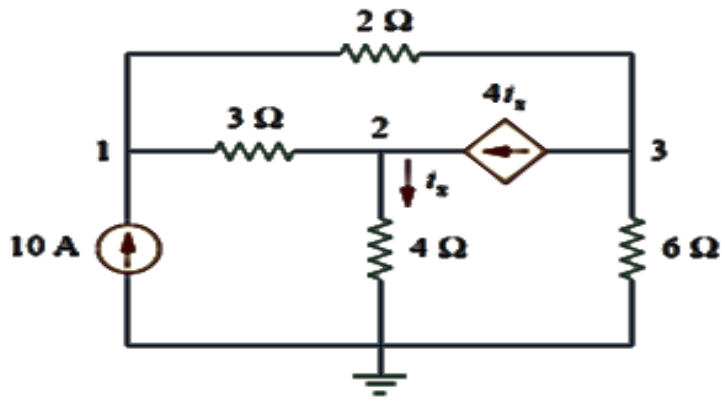
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Find the value of the voltage source V_s that delivers 2 Amps current through the circuit as shown in figure. 7 Marks L3 CO1 PO2

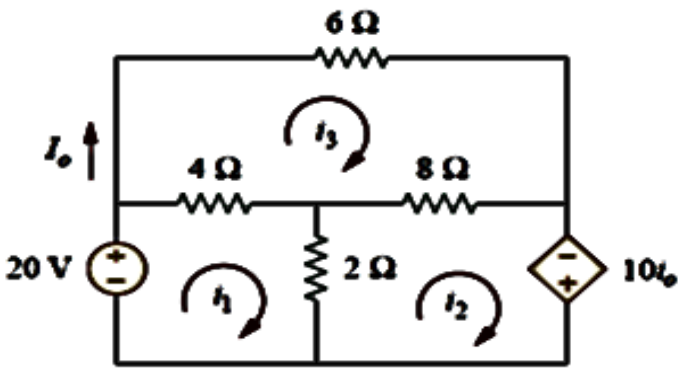


b) Find the voltages at the three non reference nodes in the circuit of figure. 7 Marks L4 CO1 PO2

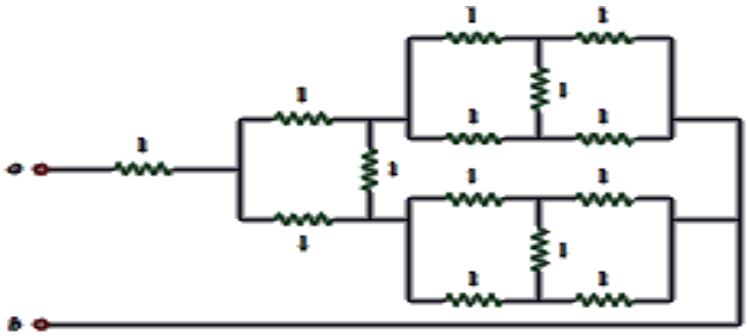


(OR)

2. a) Using mesh analysis, find I_0 in the circuit shown in figure. 7 Marks L4 CO1 PO4

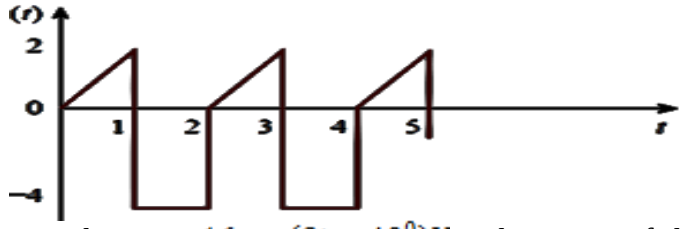


	b)	Find R_{ab} of the network shown in figure, Assume each element is 1Ω.	7 Marks	L3	CO1	PO2

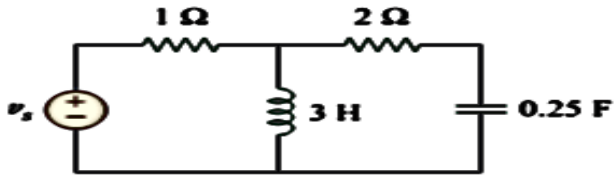


UNIT-II

3.	a)	Determine the form factor of the wave form shown in figure.	7 Marks	L3	CO2	PO2



	b)	Assuming that $v_s = 16\cos(2t - 40^0)V$ in the circuit of shown in figure, find the average power delivered to each of the passive elements.	7 Marks	L3	CO2	PO2

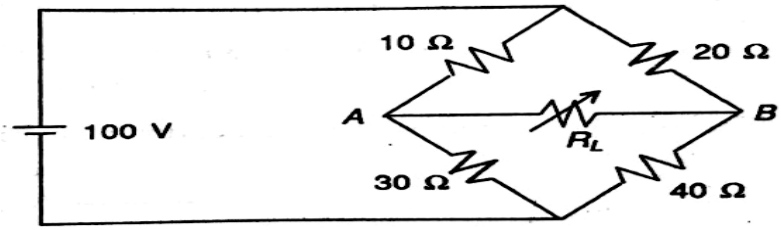


(OR)

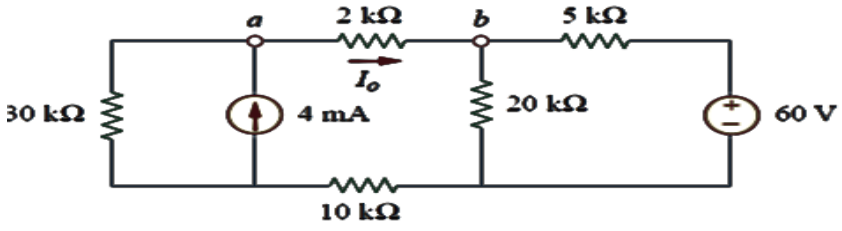
4.	a)	Design an RLC series circuit with an impedance and quality factor at 107 rad/sec are (100+j0) Ω and 100 respectively.	7 Marks	L3	CO2	PO3
	b)	Design capacitance value if the value of L is 0.02 H of series RLC circuit has a bandwidth of 500 HZ and the quality factor is 15.	7 Marks	L3	CO2	PO3

UNIT-III

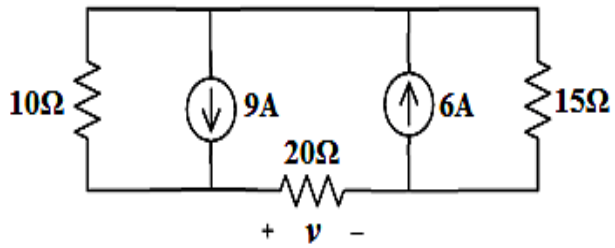
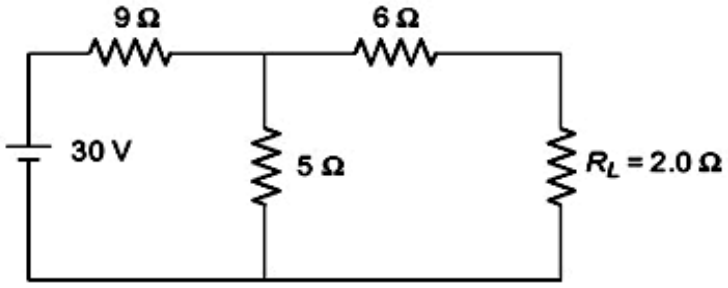
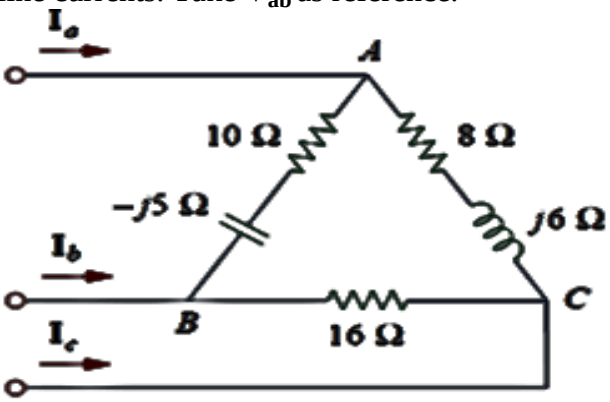
5.	a)	Determine the maximum power delivered to the load in the circuit shown in figure, using maximum power transfer theorem.	7 Marks	L3	CO3	PO5



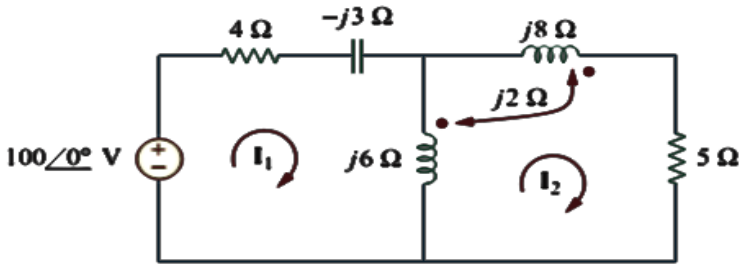
	b)	Consider the circuit in figure, an ammeter with internal resistance R_I is inserted between a and b to measure I0. Determine the reading of the ammeter if: R_I=500 Ω, 0 Ω using Thevenin's theorem.	7 Marks	L4	CO3	PO5



(OR)

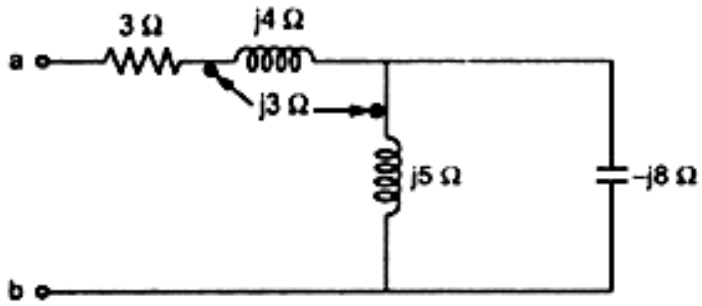
6.	a)	In the circuit shown below, find the voltage across the 20Ω resistor using Superposition Theorem. 	7 Marks	L3	CO3	PO5
	b)	Calculate the change in current of the network given below using compensation theorem when load resistor changes to 10 Ω. 	7 Marks	L3	CO3	PO5
		UNIT-IV				
7.	a)	The unbalanced delta-load shown in figure is supplied by balanced line-to-line voltages of 240 V in the positive sequence. Find the line currents. Take V_{ab} as reference. 	7 Marks	L3	CO4	PO2
	b)	Explain how a single wattmeter can be used to measure the reactive power with the help of circuit connection and derive the necessary equations.	7 Marks	L2	CO4	PO1
		(OR)				
8.	a)	A balanced delta-connected load of each phase impedance is $60\angle 30^0\ \Omega$ supplied with balanced delta-connected source has phase voltage $V_{ab} = 415\angle 30^0$ V. Find the line and phase currents.	7 Marks	L3	CO4	PO2
	b)	The two-wattmeter method produces wattmeter readings P_1 = 1560 W and P_2 = 2000 W when connected to a delta-connected load. If the line voltage is 220 V, calculate: i) The per-phase average power. ii) The per phase reactive power. iii) The power factor. iv) The phase impedance.	7 Marks	L3	CO4	PO2
		UNIT-V				
9.	a)	Derive the expressions for equivalent inductance of two coils in parallel with i) parallel aiding and ii) parallel opposition.	7 Marks	L2	CO5	PO1

b) Calculate the mesh currents shown in figure. 7 Marks L4 CO5 PO2

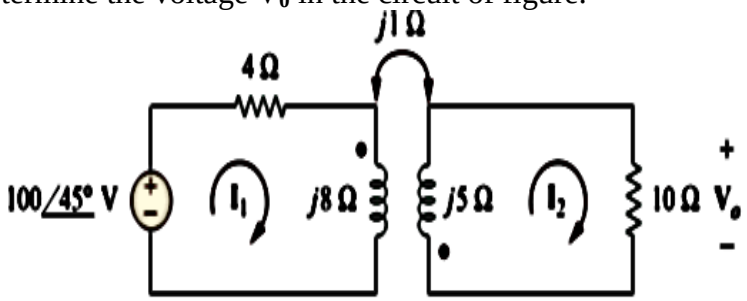


(OR)

10. a) For the coupled circuit shown in figure find the input impedance at the terminals ab 7 Marks L4 CO5 PO2



b) Determine the voltage V_0 in the circuit of figure. 7 Marks L4 CO5 PO2



CODE No.: 20BT20241 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-20) Supplementary Examinations March – 2022

NETWORK ANALYSIS

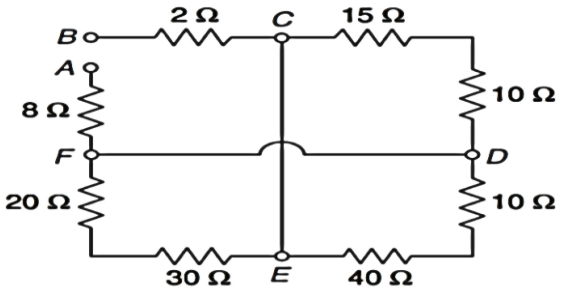
[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

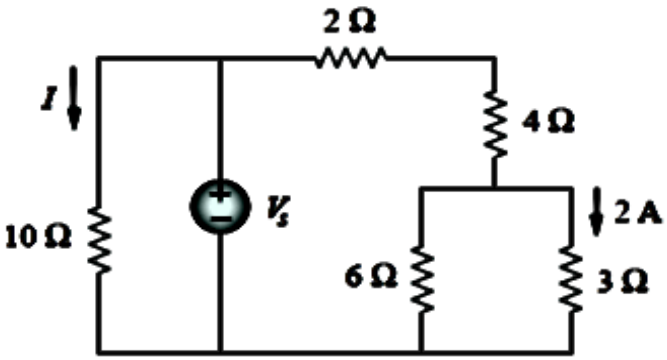
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Determine the equivalent resistance between the terminals AB of the network shown in figure:	6 Marks	L2	CO1	PO2

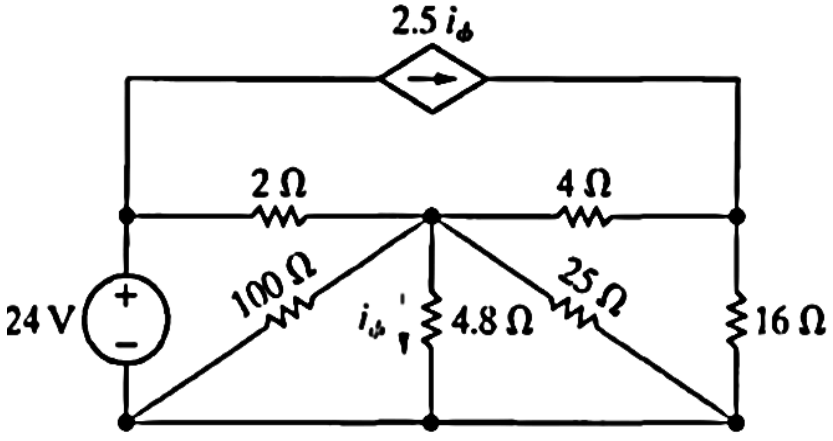


	b)	Find *I* and *Vs* in the circuit shown in figure, if the current through the 3 Ohm resistor is 2 A.	8 Marks	L4	CO1	PO2



(OR)

2.	a)	Explain how voltage source with a source resistance can be converted into an equivalent current source.	6 Marks	L2	CO1	PO2
	b)	Determine thecurernt through 4.8 Ω resistance shown in figure using Nodal analysis.	8 Marks	L3	CO1	PO4



UNIT-II

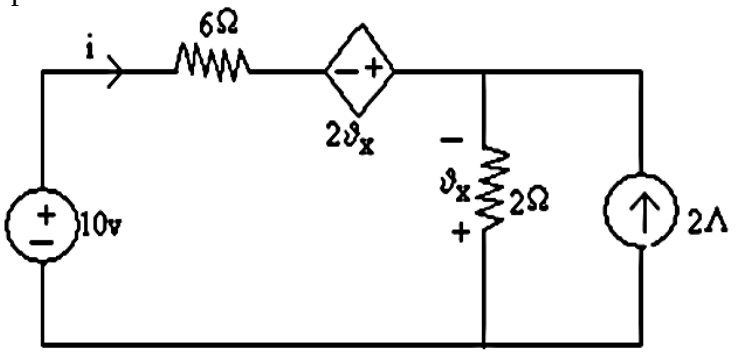
3.	a)	Draw the phasor representation of voltage and current for Resistor, inductor and capacitor with sinusoidal excitation.	6 Marks	L2	CO2	PO1
	b)	In an AC circuit source applied is *500sin(100t)* across series combination of 10Ω and 10 F, calculate source current flowing through circuit, form impedance and power triangle.	8 Marks	L4	CO2	PO2

(OR)

4.	a)	Draw the current loci for an RL Series circuit having constant reactance but variable resistance.	7 Marks	L2	CO2	PO2
	b)	A radio tuner having series RLC circuit is connected across a variable frequency supply and has R = 12 Ω, L = 1 mH and C = 1000 PF. Calculate resonant frequency, cut-off frequencies and Q factor of the tuner.	7 Marks	L3	CO2	PO6

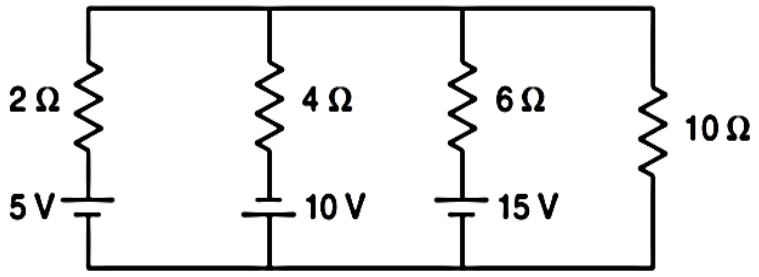
UNIT-III

5.	a)	State and explain Maximum power transfer theorem and derive the necessary conditions for maximum power transfer for a DC excitations.	7 Marks	L2	CO3	PO1
	b)	Find the current **i** in the circuit shown in figure using superposition theorem.	7 Marks	L3	CO3	PO5



(OR)

6.	a)	State and explain Millman's theorem.	6 Marks	L1	CO3	PO1
	b)	Find the current through load resistance 10Ω and also find the voltage drop across load using Millman's theorem. as shown in figure:	8 Marks	L3	CO3	PO5



UNIT-IV

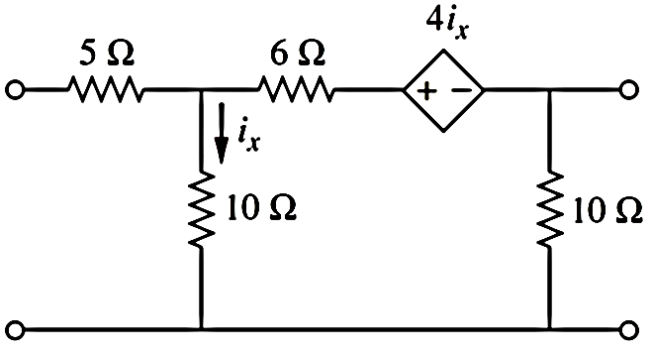
7.	a)	Distinguish between transient response and steady state response of a circuit.	6 Marks	L2	CO4	PO2
	b)	A series RC circuit with R = 50Ω and C = 2 micro farad has a sinusoidal voltage source *V = 150 Sin(500t φ+π/3)* volts applied at a time when φ=0. Find the expression for the total current. Use Laplace transforms method.	8 Marks	L3	CO4	PO5

(OR)

8.	a)	Define a time constant and derive its expression for a RC circuit excited with DC.	6 Marks	L2	CO4	PO1
	b)	A series RLC circuit with R=2 ohms, L=1H and C= 1F has a sinusoidal voltage source *v(t) = 250Sin(500t)* applied at time t=0. Determine the transient current i(t) using time domain approach. Assume zero initial conditions.	8 Marks	L3	CO4	PO2

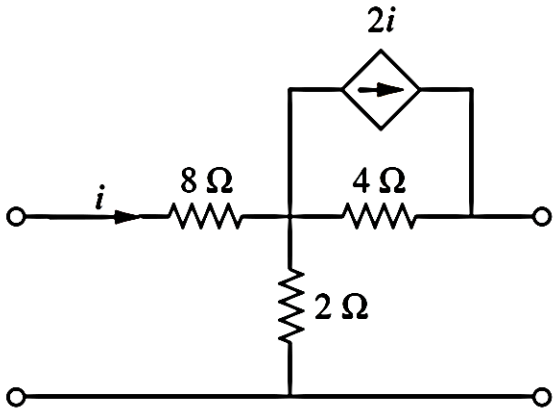
UNIT-V

9.	a)	Express *h* parameters in terms of admittance parameters for a generalized network.	7 Marks	L2	CO5	PO1
	b)	Find the *h* parameters of the network in figure. Invistigate whether the netwok is symmetrical and reciprocal.	7 Marks	L4	CO5	PO4



(OR)

10.	a)	Define reciprocity and symmetry for a generalized two port network and derive the conditions for reciprocity and symmetry in terms of Z parameters.	7 Marks	L2	CO5	PO1
	b)	Determine the y parameters for the two-port shown in figure. Invistigate whether the netwok is symmetrical and reciprocal.	7 Marks	L4	CO5	PO4



CODE No.: 20BT20301 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-20) Supplementary Examinations March – 2022

BASIC ENGINEERING MECHANICS

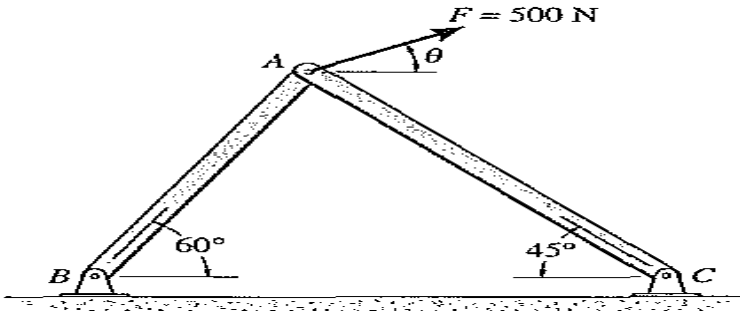
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

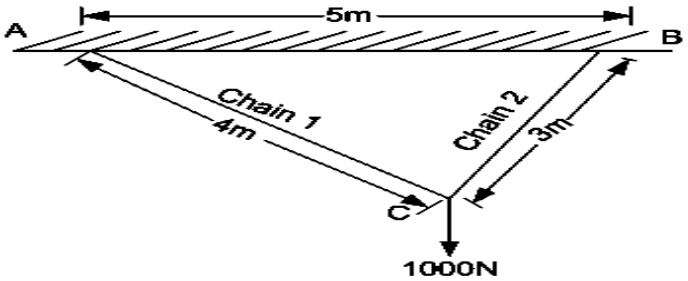
UNIT-I

1.	a)	Discuss the following terms with suitable examples: i) Coplanar forces. ii) Concurrent forces. iii) Parallel forces. iv) Non parallel forces.	7 Marks	L4	CO1	PO1
	b)	The 500N force acting on the frame is to be resolved into two components acting along the axis of the struts AB and AC as shown in Fig. If the component of force along AC is required to be 300 N, directed from A to C, determine the magnitude of force acting along AB and the angle q of the 500 N forces.	7 Marks	L4	CO1	PO1 PO2



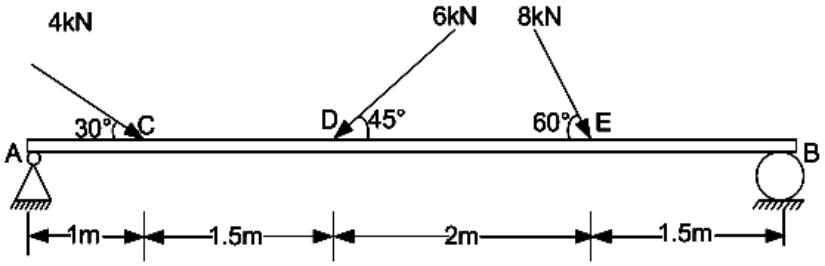
(OR)

2.	a)	State and prove Lami's theorem.	7 Marks	L4	CO1	PO1
	b)	A weight of 1000 N is supported by two chains of lengths 4 m and 3 m as shown in Fig. Determine the tension in each chain.	7 Marks	L4	CO1	PO1 PO2

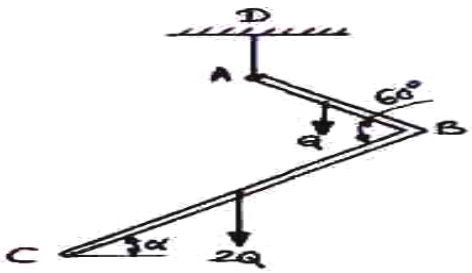


UNIT-II

3.	a)	A beam AB of span 6m is hinged at A and supported on rollers at end B and carries load as shown in Fig. Determine the reactions at A and B.	7 Marks	L4	CO1	PO1 PO2

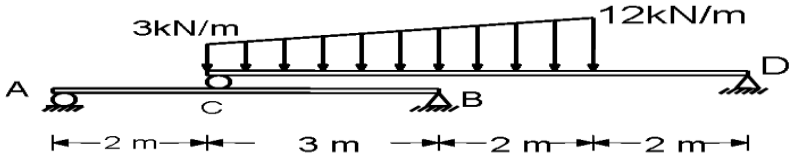


	b)	Two prismatic bars AB and BC of lengths 'L' and '2L' respectively are rigidly joined at B and suspended by string AD as shown in fig. Determine the position of equilibrium as defined by the angle 'α', that the bars will assume under the action of the weights 'Q' and '2Q'.	7 Marks	L4	CO1	PO1 PO2



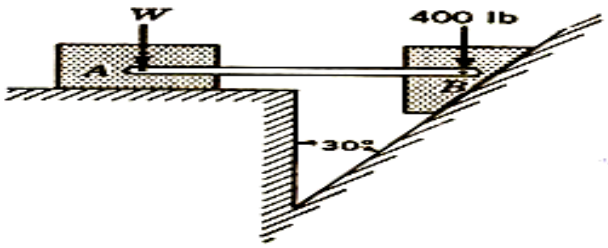
(OR)

4.	a)	Bring out the differences among perfect, deficient and redundant trusses.	7 Marks	L4	CO1	PO1
	b)	Calculate reactions at A, B, C and D as shown in the given figure.	7 Marks	L4	CO1	PO1 PO2



UNIT-III

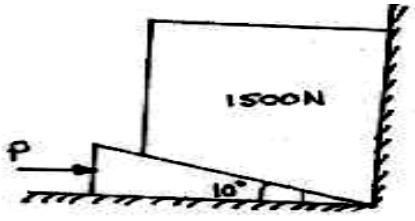
5.	a)	Two blocks, connected by a horizontal link AB are supported on two rough planes as shown in figure. The coefficient for friction of block A on the horizontal plane is μ = 0.4. The angle of friction for block B on the inclined plane is μ =0.15. What is the smallest weight W of block A for which equilibrium of the system can exist?	10 Marks	L4	CO1	PO1 PO2



	b)	State the laws of dry friction.	4 Marks	L4	CO1	PO1

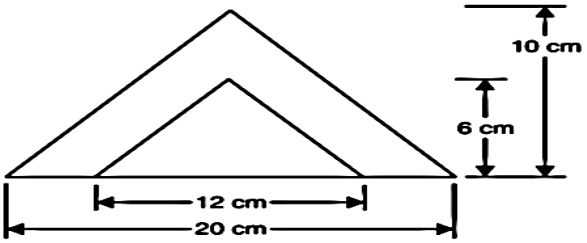
(OR)

6.	a)	Explain the following terms: i) Friction. ii) Angle of friction. iii) Limiting friction. iv) Cone of friction.	7 Marks	L4	CO1	PO1
	b)	A block overlying a 100 wedge on a horizontal floor and leaning against a vertical wall and weighing 1500N is to be raised by applying a horizontal force to the wedge. Assuming the coefficient of friction to be 0.3, determine the minimum horizontal force to be applied to raise the block as shown in the Figure.	7 Marks	L4	CO1	PO1 PO2

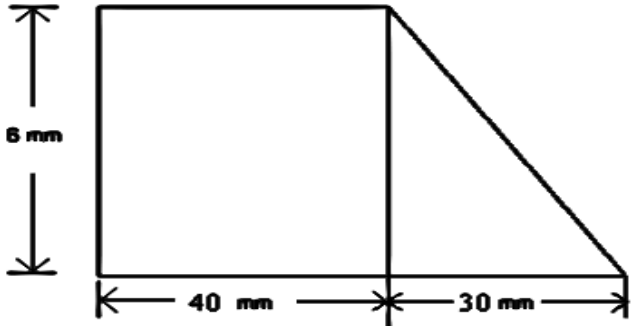


UNIT-IV

7.	a)	Find the area moment of inertia about the centroidal axes of the plane area shown in fig. Also find the section modulus.	7 Marks	L4	CO2	PO1 PO2

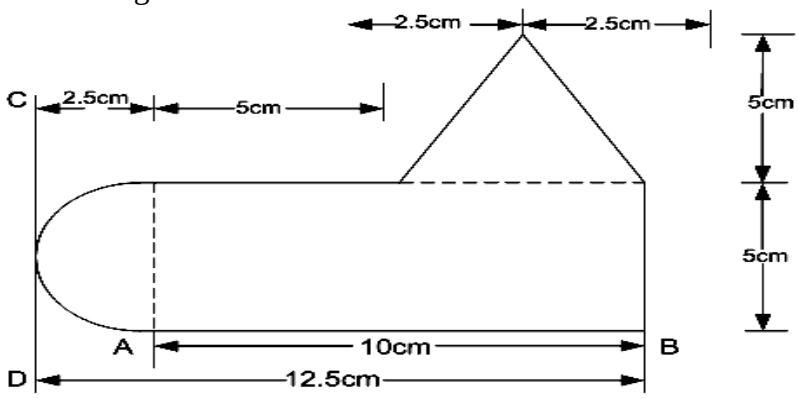


	b)	Find the centroid of the plane area shown in figure	7 Marks	L4	CO2	PO1 PO2



(OR)

8.	a)	State and prove theorems of Pappus–Guldinus.	7 Marks	L4	CO2	PO1
	b)	Determine the centre of gravity of the plane uniform lamina shown in Fig.	7 Marks	L4	CO2	PO1 PO2



UNIT-V

9.	a)	State and explain D'Alembert's principle.	7 Marks	L4	CO3	PO1
	b)	A lift carries a weight of 1000N and is moving with a uniform acceleration of 1.962 m/sec^2. Calculate the tension in the cables supporting the lift, when i) lift is moving upward, and ii) lift is moving downward.	7 Marks	L4	CO3	PO1 PO2

(OR)

10.	a)	A motor of mass 200 kg is supported by four springs, each having a constant of 150 kN/m. The unbalance of the rotor is equivalent to a mass of 30 g located 150 mm from the axis of rotation. Knowing that the motor is constrained to move vertically, determine: i) The speed in rpm at which resonance will occur. ii) The amplitude of the vibration of the motor at a speed of 1200 r.p.m.	7 Marks	L4	CO4	PO1 PO2
	b)	Find amplitude and time period of a particle moving with simple harmonic motion, which has a velocity of 9 m/s and 4 m/s at the distance of 2 m and 3 m respectively from the centre.	7 Marks	L4	CO4	PO1 PO2

CODE No.: 20BT20501 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-20) Supplementary Examinations March – 2022

DIGITAL LOGIC DESIGN

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Science)]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Convert the following numbers with the indicated bases to decimal: i) $(4310)_8$. ii) $(19AF)_{16}$.	7 Marks	L3	CO1	PO1
	b)	Explain the properties of Boolean Algebra with example.	7 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Simplify the following Boolean expressions to a minimum number of literals: i) $xy + x(wz+wz')$. ii) $xy' + y'z' + x'z'$.	7 Marks	L3	CO1	PO2
	b)	Compute dual and complement of the following Boolean expressions. i) $AB+A(B+C)+B'(B+D)$ ii) $A+B+A'B'C$	7 Marks	L3	CO1	PO2
		UNIT-II				
3.	a)	Simply the following Boolean Function using four-variable k-maps. $F\ A, B, C, D) = \Sigma(2, 3, 6, 7, 12, 13, 14) + d(0, 1, 8)$	7 Marks	L4	CO2	PO2
	b)	Draw the logic diagram for the Boolean expression using AND, OR gates. $F = x\ (y'+ z)\ (x' + y + z')$	7 Marks	L4	CO2	PO3
		(OR)				
4.	a)	Obtain the truth table for the following functions and express each function in sum of minterms and product of max terms: i) $(xy + z)\ (y + xz)$. ii) $(A'+ B)\ (B'+ C)$. iii) $y'z+wxy'+wxz'+w'x'z$.	7 Marks	L4	CO2	PO2
	b)	Minimize the expression using K-map and realize using only NAND gates. $F\ (A, B, C, D) = \sum (0, 1, 2, 9, 11)$ and don't care conditions $d\ (A, B, C, D) = (8, 10, 14, 15)$	7 Marks	L4	CO2	PO3
		UNIT-III				
5.	a)	Design a combinational circuit that converts decimal to Gray code.	7 Marks	L4	CO3	PO3
	b)	Define Multiplexer. Implement the following Boolean function using a suitable Multiplexer. **F(A, B, C, D)=∑(0, 1, 3, 4, 8, 9, 15).**	7 Marks	L4	CO3	PO3
		(OR)				

6.	a)	Design a 4-bit Magnitude comparator.	9 Marks	L4	CO3	PO3
	b)	Describe the function of an encoder and list its applications.	5 Marks	L2	CO3	PO1

UNIT-IV

7.	a)	Explain the circuit diagram of a S-R flip-flop using 2-input NOR gates.	7 Marks	L2	CO3	PO1
	b)	Draw a 3-bit parallel load register. Use D flip flops and explain its operation.	7 Marks	L2	CO3	PO1

(OR)

8.	a)	Design a 4-bit ripple counter using T flip-flops.	7 Marks	L4	CO3	PO3
	b)	Draw and explain 4-bit shift register with an example.	7 Marks	L2	CO3	PO1

UNIT-V

9.		Implement the following two Boolean functions with a PLA: ***F1(A, B, C) = Σm(0, 1, 2, 4)*** ***F2(A, B, C) = Σm(0, 5, 6, 7)***	14 Marks	L4	CO4	PO3

(OR)

10.	a)	Explain in detail the addressing scheme of 1K x 16 memory with the help of a neat diagram.	10 Marks	L2	CO4	PO5
	b)	Compare SRAM and DRAM memories.	4 Marks	L4	CO4	PO2

CODE No.: 20BT20541 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-20) Supplementary Examinations March – 2022

PROGRAMMING IN C AND DATA STRUCTURES

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	What is the use of variable? Why they are needed?	7 Marks	L2	CO2	PO1
	b)	What are the various symbols used to construct a flow chart?	7 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Describe relational, logical and bitwise operators in detail with examples.	7 Marks	L2	CO2	PO1
	b)	Write an algorithm to accept two numbers, compute the sum and print the result.	7 Marks	L3	CO1	PO2
		UNIT-II				
3.	a)	Write a C program to evaluate whether the given year is leap year or not.	7 Marks	L3	CO2	PO3
	b)	Ramesh's basic salary is input through the keyboard. His dearness allowance is 40% of basic, house rent allowance is 20% of basic salary. Write a C program to calculate his gross salary.	7 Marks	L4	CO2	PO3
		(OR)				
4.	a)	When it is required to execute set of statements repeatedly, what is the C construct helping us to implement it? Explain for loop and while loop with example.	7 Marks	L2	CO2	PO1
	b)	The factorial of a positive number n is given by: factorial of n. (n!) = 1*2*3*4....n. write a C Program to find a factorial of a number using do…while construct.	7 Marks	L3	CO2	PO3
		UNIT-III				
5.	a)	Write a C program to display the 4th element and 7th element from a list of elements in an array.	7 Marks	L3	CO3	PO3
	b)	Write a program to retrieve a string from a set of strings.	7 Marks	L4	CO3	PO3
		(OR)				
6.	a)	Write a C program to sort the given array elements in Ascending order.	7 Marks	L4	CO3	PO3
	b)	Distinguish between the following: i) Actual and formal arguments. ii) Global and local variables. iii) Automatic and static variables.	7 Marks	L3	CO3	PO2
		UNIT-IV				
7.	a)	Write a C program to illustrate the use of indirection operator to access the value pointed by a pointer.	7 Marks	L2	CO3	PO1
	b)	Develop a C program to store the data of different types using Structures.	7 Marks	L3	CO3	PO2
		(OR)				

8.	a)	Develop a C program to store the address of a variable using Pointers.	7 Marks	L2	CO3	PO2
	b)	Explain the concept of linked list in detail with an example.	7 Marks	L2	CO3	PO1

UNIT-V

9.	a)	Write a C program to implement stack and its various operations.	7 Marks	L4	CO3	PO4
	b)	Construct the step by step procedure to sort the given list of elements using Bubble sort { 54, 26, 93, 17, 77, 3, 44, 55, 20}.	7 Marks	L3	CO4	PO2

(OR)

10.	a)	Write a program to implement Queue by using arrays.	7 Marks	L4	CO3	PO4
	b)	Differentiate between the Linear search and Binary search.	7 Marks	L3	CO4	PO2

CODE No.: 20BT21501 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-20) Supplementary Examinations March – 2022

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Science), Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Compare and contrast visibility controls and also compare with each of them.	7 Marks	L4	CO1	PO2
	b)	"Java is platform independent". Justify.	7 Marks	L4	CO1	PO1
		(OR)				
2.	a)	Discuss about Command Line Arguments with an example program.	7 Marks	L2	CO1	PO1
	b)	List and explain any three features of Object Oriented Programming.	7 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	Explain the final keyword with all its usages with an example program.	7 Marks	L2	CO1	PO1
	b)	Write a program to find the factorial of a given number using a while loop.	7 Marks	L3	CO2	PO4
		(OR)				
4.	a)	Elaborate on Wrapper Classes.	7 Marks	L2	CO1	PO1
	b)	Design a program to demonstrate all the decision making statements.	7 Marks	L3	CO3	PO3
		UNIT-III				
5.	a)	Develop a java program to implement functional interfaces.	7 Marks	L3	CO3	PO3
	b)	Distinguish between abstract classes and interfaces.	7 Marks	L4	CO2	PO2
		(OR)				
6.	a)	Classify different types of Inheritance in Java.	7 Marks	L2	CO2	PO1
	b)	What is a package? Explain it with an example and also write how to import packages.	7 Marks	L2	CO2	PO2
		UNIT-IV				
7.	a)	Explain the steps in creating a thread using a runnable interface.	7 Marks	L2	CO4	PO4
	b)	Design a java program that demonstrates how a high-priority thread using sleep makes way for the lower-priority threads to execute.	7 Marks	L3	CO4	PO3
		(OR)				
8.	a)	Construct a user-defined exception named check Argument to check the number of arguments passed through command line. If the number of arguments is less than five, throw the check Argument exception else print the addition of all the five numbers.	7 Marks	L2	CO3	PO3
	b)	Design a java program to perform the following on an Array List: i) Add an element. ii) Remove an element. iii) Trace the Array List.	7 Marks	L3	CO2	PO3

UNIT-V

9.	a)	Give an overview of : i) JText Field. ii) JPassword Field.	7 Marks	L2	CO1	PO1
	b)	Develop a program that receives an integer in one text field, and computes its factorial value and returns it in another text field, when the button named "Compute" is clicked using Swing GUI Components.	7 Marks	L4	CO5	PO2
		(OR)				
10.	a)	Develop a program to illustrate the role of adapter classes in Event Handling.	7 Marks	L3	CO5	PO3
	b)	List and explain about Mouse Listener Interfaces.	7 Marks	L2	CO3	PO1

CODE No.: 20BT22901 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-20) Supplementary Examinations March – 2022

DATA STRUCTURES AND ALGORITHMS

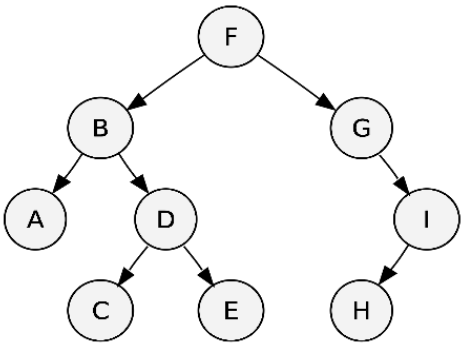
[Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Differentiate between linear search and binary search mechanisms using an example.	8 Marks	L2	CO2	PO2
	b)	Explain the following with examples. i) Space Complexity. ii) Time complexity.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Analyse the performance of insertion sort algorithm by taking an example.	7 Marks	L2	CO2	PO2
	b)	Perform selection sort on the following elements by writing a suitable algorithm: 15, 6, 18, 7, 19, 25, 46, 59, 67, 39, 96, 1, 3.	7 Marks	L3	CO2	PO5
		UNIT-II				
3.	a)	A Company has N employees and it maintains each employee data with the following attributes like: emp_id, emp-dept, emp_sal, emp_mobileno. Use a menu driven Program to perform following operations on employee's data using Doubly Linked List (DLL). i) Create a DLL of N Employees Data by using end insertion. ii) Perform Insertion and Deletion at End of DLL. iii) Exit.	8 Marks	L3	CO3	PO6
	b)	What is a double linked list? Write an algorithm to: i) Insert an element. ii) Delete an element from a circular linked list.	6 Marks	L2	CO3	PO2
		(OR)				
4.	a)	Explain the operations of Single Linked Lists.	7 Marks	L2	CO3	PO2
	b)	What is a circular linked list? Give an algorithm to delete an element from a circular linked list.	7 Marks	L2	CO3	PO2
		UNIT-III				
5.	a)	Convert the following infix expression to postfix expression ((a + ((b ∧c) - d)) * (e - (a / c))). **Note: Assume ∧ as an exponentiation operator.**	7 Marks	L3	CO4	PO3
	b)	Write a program to check whether a string is palindrome or not using stacks.	7 Marks	L3	CO4	PO5
		(OR)				
6.	a)	Write a program to implement Queues using arrays that perform enqueue, dequeue and display operations.	8 Marks	L2	CO4	PO2
	b)	Name the major drawback of a linear queue. Explain how to overcome it.	6 Marks	L2	CO4	PO2
		UNIT-IV				
7.	a)	Describe the process of deleting a node from an AVL tree with proper illustrations.	7 Marks	L2	CO5	PO2
	b)	Create a Binary Search Tree for the data items {23,14, 44,12,18,4,52,16,20,96,9,1,13} and explain the in-order traversal of the BST along with a recursive algorithm.	7 Marks	L3	CO5	PO2

(OR)

8.	a)	Construct the binary tree for the following expression. (A*(B-C))/((D-E)*(F+G-H)). **(Note: ignore parentheses in constructing binary tree).**	7 Marks	L3	CO5	PO2
	b)	For the following Binary Tree, calculate the pre-order and post-order traversals.  	7 Marks	L3	CO5	PO2

UNIT-V

9.	a)	Demonstrate insertion operation in B-tree of order 3 by using the following keys. {23, 46, 57, 89, 3, 4, 67, 194, 45, 2, 8}.	8 Marks	L3	CO5	PO2
	b)	Discuss the following with reference to graphs. i) Directed graph. ii) Undirected graph. iii) Acyclic Graph.	6 Marks	L2	CO5	PO1

(OR)

10.	a)	Write a program to implement Breadth First Search algorithm.	7 Marks	L4	CO5	PO2
	b)	What is Hashing? Explain different Hash functions used in the construction of Hash tables.	7 Marks	L2	CO6	PO2

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC10) Supplementary Examinations February – 2021

STRENGTH OF MATERIALS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer any FIVE questions
All questions carry equal marks

1. a) State and explain Hooke's law.
b) A metallic rod of 1 cm diameter, when tested under an axial pull of 10 kN was found to reduce its diameter by 0.0003 cm. The modulus of rigidity for the rod is 51 kN/mm^2. Find the Poisson's ratio, modulus of elasticity and Bulk Modulus.

2. A simply supported beam of 10m Length carries a uniformly distributed load throughout the beam length. The supports of the beam are 6m apart. Determine the position of the supports with respect to the ends so that the bending moment of the beam is least possible.

3. a) What are the assumptions made in the theory of simple bending?
b) Derive flexure formula of beams.

4. Determine the shear stress generated in a rectangular section of a beam which is subjected to a shear force F.

5. a) Derive an expression that governs the theory of pure torsion.
b) A hollow circular shaft of external diameter 50mm and wall thickness 5mm transmits a torque of 10kN-m. Find the maximum shear stress induced in the shaft.

6. A cantilever of 4m span length carries a load 40 kN at its free end. If the deflection at the free end is not to exceed 8mm, what must be the moment of inertia of the Cantilever section?

7. Show that when a thin walled spherical vessel of diameter 'd' and thickness 't' is subjected to an internal pressure 'p', the increase in volume is equal to $\frac{\pi p d^4}{8tE}(1-\nu)$.

8. A compound cylinder is made by shrinking a cylinder of external diameter 200mm and internal diameter of 160mm over another cylinder of external diameter 160mm and internal diameter 120mm. The radial pressure at the junction after shrinking is 8 N/mm^2. Find the final stresses set up across the section when the compound cylinder is subjected to an internal fluid pressure of 60 N/mm^2.

CODE No.:14BT3BS02 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations August – 2021

SPECIAL FUNCTIONS AND COMPLEX ANALYSIS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Define beta and gamma functions and establish a relationship between them. 7 Marks

b) State Bessels differential equation and its solution $J_n(x)$. Show that $J_{1/2}(x) = \sqrt{\frac{2}{\pi x}} \sin x$. 7 Marks

(OR)

2 a) Show that $2^{2n-1}\Gamma(n)\left(n+\frac{1}{2}\right) = \Gamma(2n)\sqrt{\pi}$. 7 Marks

b) Show that $J_{3/2}(x) = \sqrt{\frac{2}{\pi x}}\left(\frac{1}{x}\sin x - \cos x\right)$. 7 Marks

UNIT-II

3 a) Show that $\left(\frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2}\right)\log|f'(z)| = 0$, where $f(z)$ is analytic function. 7 Marks

b) Find the an analytic function $f(z) = u + iv$, given that $\boldsymbol{u - v = (x - y)(x^2 + 4xy + y^2)}$. 7 Marks

(OR)

4 a) Show that the function $f(z) = \sqrt{|xy|}$ is not analytic at the origin, although C-R equations are satisfied at that point. 7 Marks

b) Find the analytic function $\boldsymbol{f(z) = u + iv}$ **if** $\boldsymbol{u = a(1 + Cos\theta)}$. 7 Marks

UNIT-III

5 a) Evaluate $\int_0^{2+i} z^2\,dz$ along the imaginary axis to i and then horizontally to 2 + i. 7 Marks

b) Evaluate $\int_C \frac{z^3 + z^2 + 2z - 1}{(z-1)^3} dz$ *where C is* $|z| = 3$ using Cauchy's integral formula. 7 Marks

(OR)

6 a) State Cauchy's theorem and verify it for the function $f(z) = z^2 + 3z - 2i$ *inside the circle* $|z| = 1$. 7 Marks

b) Write the Laurent series expansion of $f(z) = \frac{z^2 - 1}{(z+2)(z+3)}$, *for* $|z| > 3$. 7 Marks

UNIT-IV

7 a) Determine the poles and corresponding residues for the function f(z)= $\frac{z^2}{(z-1)(z-2)^2}$. 7 Marks

b) By the method of residues, evaluate $\int_0^{2\pi} \frac{d\theta}{1-2a\sin\theta+a^2}$ 0 <a<1. 7 Marks

(OR)

8 a) Calculate the value of $\oint_c \frac{z-3}{z^2+2z+5}$ dz where C is the circle |z+1+i 1=2. 7 Marks

b) Evaluate $\int_0^{\infty} \frac{dx}{(x^2+1)^2}$. 7 Marks

UNIT-V

9 a) Find the image of the infinite strip $\frac{1}{4} \le y \le \frac{1}{2}$ under the transformation w=$\frac{1}{z}$. 7 Marks

b) Find the Bilinear Transformation which maps the points z = l-i-1 in to the points w = i, 0, - i. 7 Marks

(OR)

10 a) Show that the Bilinear Transformation maps circles to circles. 7 Marks

b) Discuss about the transformation *w = Cosz*. 7 Marks

CODE No.:14BT3BS03 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations August – 2021

PROBABILITY AND STATISTICS

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) In a certain college 25% of boys and 10% of girls are studying mathematics. The girls contribute 60% of the student body. (i) What is the probability that mathematics is being studied? (ii) If a student is selected at random and is found to be studying mathematics, find the probability that the student is a girl. 7 Marks

b) X is a continuous random variable with probability density function given by 7 Marks

$$f(x) = \begin{cases} kx, & 0 \le x \le 2 \\ 2x, & 2 \le x \le 4 \\ k(6-x), & 4 \le x \le 6 \end{cases}$$

Determine: i) *k.* ii) mean. iii) variance.

(OR)

2 a) Define the following and illustrate with example. 6 Marks
i) Probability. ii) Mutually exclusive events. iii) Conditional event.

b) A random variable X has the following probability function: 8 Marks

X	0	1	2	3	4	5	6	7	8
P(X)	k/45	k/15	k/9	k/5	2k/45	6k/45	7k/45	8k/45	4k/45

Determine: i) *k* ii) $P(X < 4)$ iii) $P(X > 1)$ (iv) $P(2 < X < 7)$

UNIT-II

3 a) Derive mean and variance of Binomial Distribution. 7 Marks

b) Samples of (n=6) items are drawn at random from the production process which is making 10% defectives, calculate the probabilities of 0,1,2,3,4,5 and 6 defectives in a sample. 7 Marks

(OR)

4 a) Derive the mean and variance of normal distribution. 7 Marks

b) If x is a Poisson variable such that $p(x = 1) = 24\ p(x = 3)$, find the probability $p(x=0)$. 7 Marks

UNIT-III

5 a) Altoona Tire Company sells its ATC-50 tires with a 50,000-mile tread-life warranty. Loorie Ackerman, a quality control engineer with the company, runs simulated road tests to monitor the life of the output from the ATC-50 production process. From each of the last 10 batches of 1,000 tires, she has tested 5 tires and recorded the following results, with $\overline{X}$ and R measured in thousands of miles: 7 Marks

Batch	1	2	3	4	5	6	7	8	9	10
$\overline{X}$	50.5	49.7	50.0	50.7	50.7	50.6	49.8	51.1	50.2	50.4
R	1.1	1.6	1.8	0.1	0.9	2.1	0.3	0.8	2.3	1.3

i) Use the data above to help Lorrie construct a $\overline{X}$ chart.
ii) Is the production process in-control? Explain.

b) Calculate coefficient of correlation from the following data. 7 Marks

x	12	9	8	10	11	13	7
y	14	8	6	9	11	12	3

(OR)

6 a) The numbers of defective washers in a workshop of 20 samples containing 500 washers are 25, 30, 32, 28, 35, 27, 28, 30, 33, 35, 38, 40, 21, 26, 24, 40, 29, 28, 26, 38. Calculate the values for central line and the control units for P-Chart. 7 Marks

b) Calculate Karl Pearson's correlation coefficient for the following paired data 7 Marks

x	28	41	40	38	35	33	40	32	36	33
y	23	34	33	34	30	26	28	31	36	38

What inference would you draw from the estimate?

UNIT-IV

7 a) A population consists of five numbers 12, 32,40,51,60. Consider all samples of size two which can be taken without replacement from this population. Estimate: 8 Marks

i) The population mean.
ii) The population Standard deviation.
iii) The mean of the sampling distribution of means.
iv) Standard deviation of the sampling distribution of means.

b) A sample of size 81 was taken whose variance is 20.25 and means 32. Construct 95%. Confidence interval for the mean. 6 Marks

(OR)

8 a) When a sample is taken from an infinite population discuss about the standard error of the mean if the sample size is decreased from 800 to 200. 7 Marks

b) A sample of 100 electric bulbs produced by a manufacturer A showed a mean life time of 1190hrs and a standard deviation of 90 hrs. Another sample of 75 bulbs produced by a manufacturer B showed a mean life of 1230hrs with a S.D of 120hrs. Test the significance of the difference between the means at 99% level. 7 Marks

UNIT-V

9 a) A random sample of 10 boys had the following IQS 70, 120, 110, 101, 88, 83, 95, 98, 107, 100 Does this data support the assumption of population IQ of 100 (Tabulated value2.262 at 5% L.O.S) 7 Marks

b) Two independent random sample each of 8 individuals provide the following data. Estimate the variance ration and test the significance. 7 Marks

Sample –I	63	64	65	65	66	66	67	68
Sample-II	69	66	67	67	66	68	69	69

(tabulated each 3.80 at 5% L. O.S)

(OR)

10 a) Two Horses A and B were Tested according to the time (in seconds) to run a particular track with the following results. 7 Marks

Horse(A)	28	30	32	33	33	29	34
Horse(B)	29	30	30	24	27	29	-

Test whether the two Horses have the same running capacity. (Tabulated value 2.20 at 5% L.O.S).

b) Fit a Poisson distribution to the following data and test – the goodness of fit at 5% leave of significance. 7 Marks

X	0	1	2	3	4	5	6	7
F	305	366	210	80	28	9	2	1

CODE No.:14BT30102 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations August - 2021

MECHANICS OF SOLIDS

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Find the force 'P' acting at C in the bar shown in Fig.1. Find the extension of the bar if $E = 2x10^5$ MPa. 7 Marks

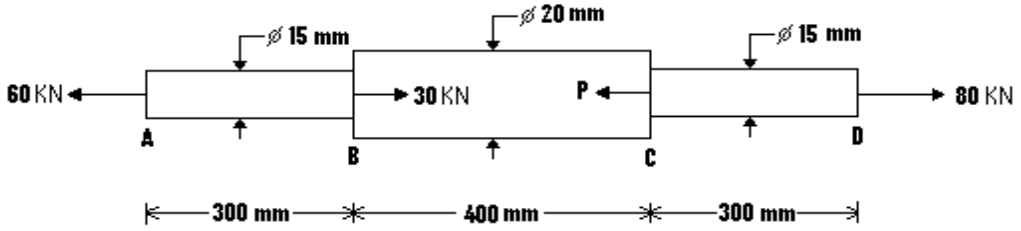


Fig.1.

b) A bar of 20 mm diameter is tested in tension. It is observed that when a load of 37.7 kN is applied, the extension measured over a gauge length of 200mm is 0.12mm and contraction in diameter is 0.0036mm. Find Poisson's ratio and Young's modulus. 7 Marks

(OR)

2 A round copper rod, 560mm long, has a diameter of 30mm over a length of 200mm, a diameter of 20mm over a length of 200mm and a diameter of 10mm over its remaining length. Determine the stresses in each section and elongation of the rod when it is subjected to a pull of 30 kN. Take E= 100kN/mm^2. 14 Marks

UNIT-II

3 Define the SF and BM at a section of a beam. Explain the utility of drawing SF and BM diagrams for a beam. Also obtain relationship between SF and BM. 14 Marks

(OR)

4 A simply supported beam of span 6 m carries a clockwise couple of 5 kN-m at 2m from left support and another anticlockwise couple of 10 kN-m at 4m from left support. The beam carries a UDL of intensity 2 kN/m between the couple. Sketch the SFD and BMD. 14 Marks

UNIT-III

5 Three steel, plates of width 300mm and thickness 10mm are welded together to form a channel section. What is the moment of resistance of the section if the allowable bending in compression is 60MPa and in tension is 80MPa? 14 Marks

(OR)

6 Sketch the variation of shear stress across the depth of an I section of depth 300mm, web thickness 10mm and flange size of 100mm x 10mm. The Flexural shear force action on the section is 200kN. 14 Marks

UNIT-IV

7 Derive Torsion equation and determine the power transmitted by a solid shaft of 120 mm diameter rotating at 100 r.p.m., if the maximum shear stress is not to exceed 80 Mpa. The maximum torque is 20% more than its mean value. 14 Marks

(OR)

8 A closely coiled helical spring of round steel wire 10 mm in diameter having complete turns with a mean diameter of 12 cm is subjected to an axial load of 200N. Determine: 14 Marks

i) The deflection of spring.
ii) Maximum shear stress in wire.
iii) Stiffness of the spring.

UNIT-V

9 A thin steel cylindrical shell of thickness 14 mm, 1 m diameter and 3.25 m long is carrying a fluid at a pressure of 1.6 N/mm^2. Find the change in dimensions of the cylinder. 14 Marks

(OR)

10 Derive lame's equations for the analysis of thick cylinders. Also sketch the variation of radial stress and hoop stress across the thickness of cylinder having internal radius 150mm and external radius 400mm subjected to an internal pressure of 8Mpa. 14 Marks

CODE No.:14BT30104 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations August - 2021

FLUID MECHANICS-I

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Explain the terms: (i) Dynamic viscosity. (ii) Kinematic viscosity. Give their dimensions. Calculate the density, specific weight and weight of one litre of petrol of specific gravity 0.7.	14 Marks
		(OR)	
2		Differentiate between: (i) Absolute and gauge pressure (ii) Simple manometer and differential manometer. A rectangular plane surface is 2m wide and 3m deep. It lies in vertical plane in water. Determine the total pressure and position of centre of pressure on the plane surface when its upper edge is horizontal and coincides with the water surface.	14 Marks

UNIT-II

3		Derive continuity equation for one dimensional flow and list out uses and limitations of flow net.	14 Marks
		(OR)	
4	a)	Define path line, streak line and the streamline. For what type of flow these lines are identical?	7 Marks
	b)	Define the Equation of Continuity. Derive the Continuity Equation for three dimensional flows from fundamentals by indicating the assumptions made where ever are required.	7 Marks

UNIT-III

5		Derive Darcy - Weisbach equation and a pipe line AB of diameter 300mm and of length 400m carries water at the rate of 50 lit / sec. The flow takes place from A to B where point B is 30m above A. Find the pressure at A if the pressure at B is 19.62 N/cm^2. Take f = 0.008.	14 Marks
		(OR)	
6		A weir 36m long is divided in to 12 equal bays by vertical posts, each 60cm wide. Determine the discharge over the weir if the head over the crest is 1.20m and velocity of approach is 2metres per second.	14 Marks

UNIT-IV

7		Describe the Reynolds's experiment with a neat sketch. Explain how would you distinguish between hydro dynamically smooth and rough boundaries.	14 Marks
		(OR)	
8		A laminar flow is taking place in a pipe of diameter 200mm. The maximum velocity is 1.5 m/s. Find the mean velocity and the radius at which this occurs. Also calculate the velocity at 4cm from the wall of the pipe.	14 Marks

UNIT-V

9		Explain the procedure for solving problem by Buckingham's π theorem in briefly.	14 Marks
		(OR)	
10		Explain the following . i) Geometric Similarity. ii) Kinematic Similarity. iii) Dynamic Similarity.	14 Marks

CODE No.:14BT30201 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations August – 2021

ELECTROMAGNETIC FIELDS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define electric field intensity. Explain in detail the different ways of obtaining elastic field.	7 Marks
	b)	Derive the expression for energy density in electric field.	7 Marks
		(OR)	
2	a)	State and explain Gauss law.	7 Marks
	b)	Two dipoles with dipole moments $-5a_z$ Rc/m and $9a_z$ Rc/m are located at points (0, 0, -2) and (0, 0, 3) respectively. Find the potential at the origin.	7 Marks

UNIT-II

3	a)	Derive the expression for EFI due to an Electric dipole.	7 Marks
	b)	Two point charges of 2 μC and -2 μC are located at (0, 0, 1) and (0, 0, -1) respectively, in free space. Find the potential at (0, 3, 4) m.	7 Marks
		(OR)	
4	a)	Derive the expression for Potential due to an Electric dipole.	7 Marks
	b)	Derive the expression for capacitance of a parallel plate capacitor without composite Dielectric material.	7 Marks

UNIT-III

5	a)	State and prove Biot-Savort's law.	7 Marks
	b)	Find the Magnetic Field intensity at Point P(2, 2, 3) caused by a current filament of 25 A in the $\mathbf{a_z}$ direction and extending from Z = 0 to Z = 6.	7 Marks
		(OR)	
6	a)	Write Maxwell's Fourth equation in Integral form and explain.	7 Marks
	b)	Obtain the expression for Magnetic Field Intensity due to infinitely long co-axial transmission line by applying Ampere's circuital Law.	7 Marks

UNIT-IV

7	a)	Explain the classification of magnetic materials.	7 Marks
	b)	Derive the expression for magnetic energy density in a magnetic field.	7 Marks
		(OR)	
8	a)	Calculate the self-inductance per unit length of an infinitely long solenoid.	7 Marks
	b)	Explain about the magnetic boundary conditions.	7 Marks

UNIT-V

9	a)	Explain the difference between induced, transformer and motional **emf**.	7 Marks
	b)	Write the point form of Maxwell's equations. Explain their significance.	7 Marks
		(OR)	
10	a)	Define displacement current. Derive the expression for displacement current density.	7 Marks
	b)	Write the integral form of Maxwell's equations. Explain their significance.	7 Marks

❀ ❀ ❀

CODE No.:14BT30203 SVEC-14

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations August – 2021

ELECTRIC CIRCUITS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Determine current I in the network shown in fig. 1. 7 Marks

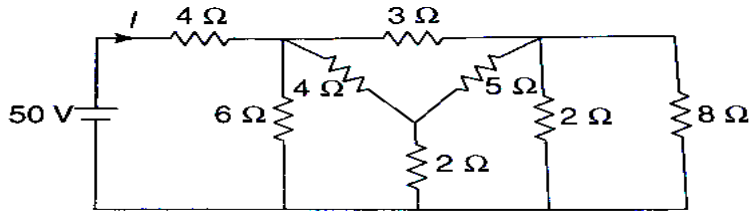


Fig.1

b) Determine the voltage drop across 5Ω resistor in fig. 2 using nodal analysis. 7 Marks

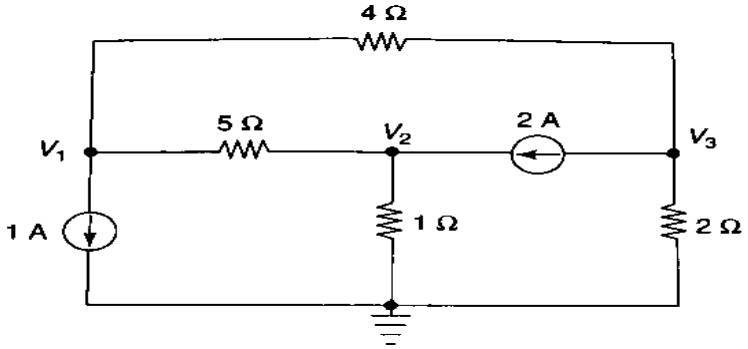


Fig. 2

(OR)

2 a) Determine the equivalent resistance between the terminals A and B for the network shown in fig. 3. 7 Marks

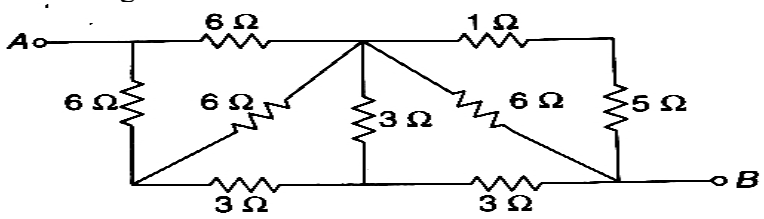


Fig. 3

b) List the steps involved in constructing the dual of a network. 7 Marks

UNIT-II

3 a) Analyze the behavior of a series RC circuit excited by a sinusoidal voltage source. 7 Marks

b) A series circuit consumes 2kW at 0.8 power factor lag when connected to 230 V, 50Hz supply. Calculate current, kVA , kVAR. 7 Marks

(OR)

4 a) Derive the resonant frequency of parallel combination of series RC and RL circuits. 8 Marks

b) Distinguish between series and parallel Resonance. 6 Marks

UNIT-III

5 a) Derive the relation between line and phase quantities in a three phase balanced star connection. 7 Marks

b) Three identical impedances of (3+j4)Ω are connected in delta. Find an equivalent star network such that the line current is the same when connected to the same supply. 7 Marks

(OR)

6 Explain the measurement of three phase power using two wattmeter methods with neat phasor diagram. 14 Marks

UNIT-IV

7 a) State and explain Faraday's law of Electromagnetic Induction. 6 Marks

b) Two coils A and B are wound on same ferromagnetic core. There are 300 turns on A and 2800 turns on B. A current of 4A through coil A produces a flux of 800μWb in the core. If this current is reversed in 20ms, find the average e.m.f induced in coils A and B. 8 Marks

(OR)

8 a) A steel ring of 25cm mean diameter and of circular section of 3cm in diameter has an air gap of 1.5mm length. It is wound uniformly with 700 turns of wire carrying a current of 2A. Calculate. 10 Marks

i) Magneto motive force.
ii) Flux density.
iii) magnetic flux.
iv) Relative permeability of steel ring.

b) Explain about series connection of coupled coils. 4 Marks

UNIT-V

9 a) State and explain maximum power transfer theorem with a suitable example. 7 Marks

b) Obtain the current in 2Ω resistor in the circuit of Fig.4 by using thevenin's theorem. 7 Marks

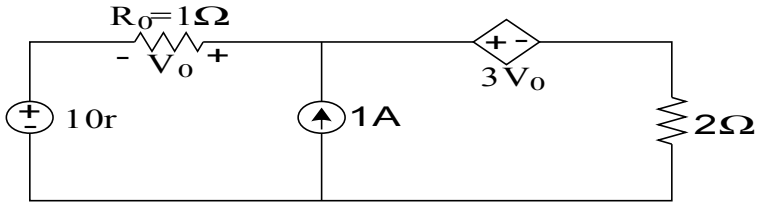


Fig.4

(OR)

10 a) State and explain superposition theorem with a suitable example. 7 Marks

b) For the circuit shown in Fig.5, if the resistance of 5Ω branch is increased to 6Ω, Determine the compensation source and verify the results. 7 Marks

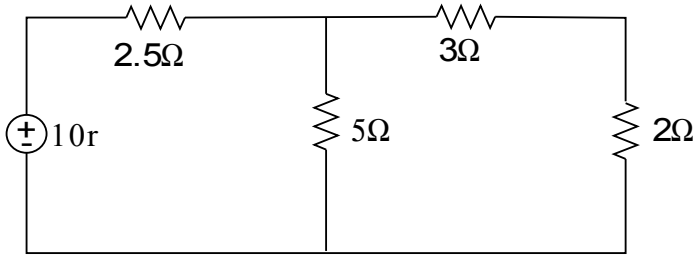


Fig.5

❀ ❀ ❀

CODE No.:14BT30232 SVEC-14

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations August - 2021

NETWORK ANALYSIS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Explain about series and parallel inductive and capacitive circuit. 8 Marks

b) The filament of a light in the circuit has a certain amount of resistance. The bulb operates with 120V and 0.8A of current, what is the resistance of its filament? 6 Marks

(OR)

2 a) State Kirchoffs voltage and current law with suitable examples. 4 Marks

b) Explain voltage division rule and current division rule with an example. 5 Marks

c) Find the current through branch a-b using mesh analysis shown Figure.1. 5 Marks

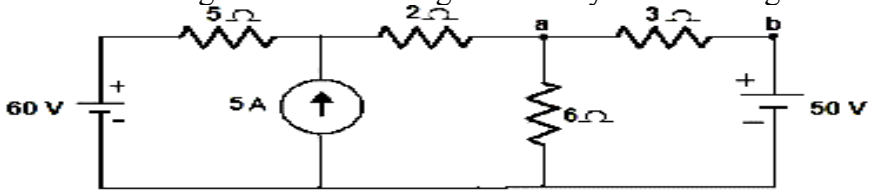


Figure.1

UNIT-II

3 a) Define resonance and explain the characteristics of series resonance. 7 Marks

b) Design a series R-L-C circuit that resonates at 1.5kHz and consumes 50W from a 50V A.C source operating at the resonance frequency. The bandwidth is 0.75 kHz. 7 Marks

(OR)

4 a) Distinguish between series and parallel Resonance circuits. 6 Marks

b) A non-alternating periodic waveform has been shown in Figure.2.Find its form factor. 8 Marks

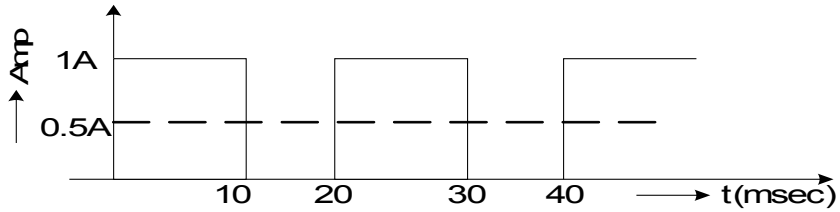


Figure.2

UNIT-III

5 a) Obtain the Transient response of RC series circuit for sinusoidal excitation. 7 Marks

b) A series RC circuit has R=20Ω and C=100μF. A voltage v = 200 Sin 314t is applied at t=2.14msec. Obtain an expression for current. Find the value of current after time 1 m sec from the switching instant. 7 Marks

(OR)

6 Explain and derive the expressions of Transient response of RLC series circuit with sinusoidal excitation. 14 Marks

UNIT-IV

7 a) Define port network and obtain the equations of an impedance parameters of two port network. 7 Marks

b) Derive the Z-parameter equations for lattice network. 7 Marks

(OR)

8 Find the Z and Y-parameters of the circuit shown in Figure.3 and check the condition for symmetry and reciprocity. 14 Marks

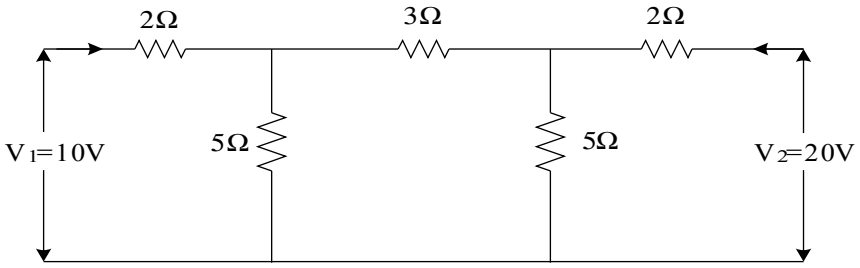


Figure.3

UNIT-V

9 a) State and explain maximum power transfer theorem and derive the condition for maximum power transfer in an AC circuits. 7 Marks

b) Using Norton's theorem, find current through 6Ω resistor shown in Figure.4. 7 Marks

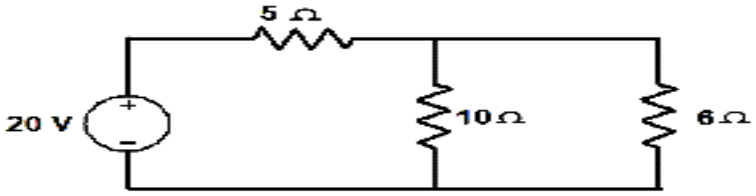


Figure.4

(OR)

10 a) State reciprocity theorem and explain with an example. 6 Marks

b) Find the voltage across the 20 Ω resistor by using superposition theorem for the circuit shown in Figure.5 8 Marks

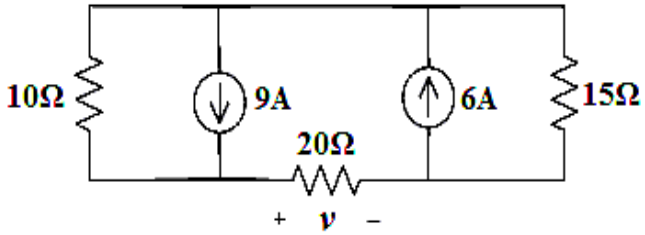


Figure.5

CODE No.:14BT30401 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations August – 2021

PROBABILITY AND STOCHASTIC PROCESSES
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define probability based on set theory and fundamental axioms.	7 Marks
	b)	Two boxes are selected randomly. The first box contains 2 black balls and 3 white balls. Second box contains 4 white and 6 black balls. What is the probability of drawing a white ball?	7 Marks

(OR)

2	a)	Define joint and conditional probabilities.	4 Marks
	b)	When are two events said to be collectively exhaustive? Explain with examples.	5 Marks
	c)	Estimate the probability of the card being either red or a king when one card is drawn from a deck of a regular 52 cards.	5 Marks

UNIT-II

3	a)	What is the Gaussian random variable? Explain the other distribution and density Examples.	8 Marks
	b)	Assume automobile arrivals at a gasoline station are Poisson and occur at an average rate of 50/h. The station has only one gasoline pump. If all the cars are assumed to require one minute to obtain fuel, what is the probability that a waiting line will occur at the pump?	6 Marks

(OR)

4	a)	Explain Conditional density and list the properties of conditional density.	6 Marks
	b)	The sample space for an experiment is S = {0, 1, 2, 5, 6}. List all the possible values of the following random variables; (i) X = 2s, (ii) X = $5s^2$ -1.	8 Marks

UNIT-III

5	a)	Explain the concept of "Expected value of a random variable" .	6 Marks
	b)	Explain with necessary equation about "Joint density "and list all the properties of the same.	8 Marks

(OR)

6	a)	Explain Central limit theorem in detail.	6 Marks
	b)	Discuss Moments about the Origin, Central moments, Variance and skew.	8 Marks

UNIT-IV

7	a)	Explain the meaning of "Mean - Ergodic processes "and Correlation -Ergodic processes.	6 Marks
	b)	Explain linear time invariant system and time invariant system transfer function.	8 Marks

(OR)

8	a)	Explain in detail about Poisson Random process and compare it with Gaussian random process.	6 Marks
	b)	What is the meaning of cross correlation function and list all the properties of cross correlation.	8 Marks

UNIT-V

9	a)	Define thermal noise and explain its relationship to the bandwidth and temperature.	7 Marks
	b)	An amplifier with gain = 30 dB and BN = 25 kHz is found to have T0 = 120 K. Find Te and Noise figure.	7 Marks

(OR)

10	a)	Derive the equation for Noise figure of Cascaded system in terms of individual Noise Figures.	7 Marks
	b)	State and prove any three properties of Narrow band Noise processes.	7 Marks

CODE No.:14BT30402 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations August – 2021

SEMICONDUCTOR DEVICES AND CIRCUITS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the V-I characteristics of PN diode and Zener diode. Also differentiate them.	7 Marks
	b)	Draw the circuit of a full wave rectifier circuit with L section filter and derive the expression for ripple factor.	7 Marks
		(OR)	
2	a)	Explain the formation of depletion region in an open circuited PN-junction. What is the significance of barrier potential across a PN-junction?	7 Marks
	b)	A HWR circuit is supplied from a 230-V, 50Hz supply with a step-down ratio of 3:1 to a resistive load of 10 kΩ. The diode forward resistance is 10Ω. Calculate maximum, average, RMS values of current, DC output voltage, efficiency of rectification and ripple factor.	7 Marks

UNIT-II

3	a)	Sketch the input and output characteristics of a transistor in CB configuration.	7 Marks
	b)	Explain how a transistor works as an amplifier.	7 Marks
		(OR)	
4	a)	Explain how you would locate the operating point using the load line.	7 Marks
	b)	Explain, with necessary circuit diagram, the collector to base bias arrangement and derive at an expression for its stability factor.	7 Marks

UNIT-III

5	a)	Define h-parameters. How do you determine h-parameters from transistor characteristics?	7 Marks
	b)	Draw the circuit diagram of CB amplifier circuit and its h-parameter equivalent circuit. List the characteristics of a CB amplifier.	7 Marks
		(OR)	
6	a)	Analyze the CC amplifier using approximate hybrid model.	8 Marks
	b)	Describe the simplified hybrid model.	6 Marks

UNIT-IV

7	a)	Explain the pinch-off voltage,V-I characteristics of JFET .	6 Marks
	b)	With neat diagram, explain the operation of MOSFET in Enhancement mode.	8 Marks
		(OR)	
8	a)	Explain the common drain amplifier and derive expression for gain of the amplifier.	8 Marks
	b)	Write the comparisons of BJT and JFET.	6 Marks

UNIT-V

9	a)	Explain the principle and operation of tunnel diode.	6 Marks
	b)	Explain the construction, operation, equivalent circuit V-I characteristics and application of UJT.	8 Marks
		(OR)	
10	a)	With neat diagram, explain about varactor diode.	6 Marks
	b)	Explain the construction, operation, V-I characteristics and application of SCR.	8 Marks

❀ ❀ ❀

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

FOUNDATIONS OF ELECTRICAL ENGINEERING
[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain about various types of sources used in electrical circuit analysis.	7 Marks
	b)	Explain when the mesh analysis and super mesh analysis are used.	7 Marks
		(OR)	
2		State and prove Kirchhoff's laws.	14 Marks

UNIT-II

3	a)	Define the terms Admittance, Impedance, Conductance and Suceptance.	6 Marks
	b)	Show that in an AC circuit, current through purely capacitive circuit leads the applied voltage by 90^0.	8 Marks
		(OR)	
4	a)	Define the terms complex power, real power and reactive power.	7 Marks
	b)	Differentiate between form factor, peak factor and power factor.	7 Marks

UNIT-III

5	a)	Mention the applications of various types of DC generator.	7 Marks
	b)	Derive the expression for emf equation of a DC generator.	7 Marks
		(OR)	
6	a)	Derive torque equation of a DC motor from fundamentals.	7 Marks
	b)	Classify different types of DC generators with neat circuit diagram.	7 Marks

UNIT-IV

7	a)	Explain the working principle of AC servomotor.	7 Marks
	b)	Explain the working principle of stepper motor.	7 Marks
		(OR)	
8	a)	Explain AC servomotors in detail.	8 Marks
	b)	List out various types of losses occurred in electrical machines and explain.	6 Marks

UNIT-V

9	a)	Discuss about open loop systems with illustrations.	7 Marks
	b)	Discuss various time variant and time invariant systems with illustrations.	7 Marks
		(OR)	
10	a)	Write relations between force-voltage and force-current analogy.	7 Marks
	b)	Define signal flow graph and derive the transfer function using Mason's gain formula.	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

MATRICES AND NUMERICAL METHODS
[Civil Engineering, Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Test for consistency and then solve the system of equations 7 Marks
$\mathbf{x + 2y - z = 3,\ 3x - y + 2z = 1,\ 2x - 2y + 3z = 2,\ x - y + z = -1}$.

b) State Cayley - Hamilton theorem and using it find the inverse of the matrix 7 Marks
$\begin{bmatrix} 1 & 0 & 2 \\ 0 & 1 & 2 \\ 1 & 2 & 0 \end{bmatrix}$.

(OR)

2 a) Solve the system of equations 7 Marks
$\mathbf{3x + 2y + z = 0,\ 2x + 3z = 0,\ y + 3z = 0,\ x + 2y + 3z = 0.}$

b) Find the eigen values and the corresponding eigen vectors of the matrix 7 Marks
$\begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & -2 \\ 2 & -2 & 1 \end{bmatrix}$

UNIT-II

3 a) Using Newton-Raphson method find the root of the equation $\boldsymbol{x + \log_{10} x = 3.375}$, 7 Marks
correct to three decimal places.

b) From the following table of half-yearly premium for policies maturing at different ages, estimate the premium for policies maturing at age of 46. 7 Marks

Age	45	50	55	60	65
Premium (in rupees)	114.84	96.16	87.32	74.48	68.48

(OR)

4 a) By using bisection method, find an approximate root of the equation Sin x =1/x, 7 Marks
that lie between x=1 and x= 1.5(measured in radians), carry out computations up to 5 stages.

b) A curve passes through the points (1, -3), (3, 9),(4, 30) and (6,132). Find the slope 7 Marks
of the curve at x=2.

UNIT-III

5 a) 7 Marks
Estimate the value of $\frac{dy}{dx}$ *and* $\frac{d^2y}{dx^2}$ *at* $x =$ 4.0 at x = 4.0 from the following data.

x	1.5	2.0	2.5	3.0	3.5	4.0
y	3.375	7.0	13.625	24.0	38.875	59.0

b) Applying Rungekutta method, estimate y when x = 1.2 in steps of 0.1 given that 7 Marks
$\frac{dy}{dx} = x^2 + y^2,\ y(1) = 1.5$.

(OR)

6 a) The following table of values of x and y are given. Find $\frac{dy}{dx}$ when x =1 and x=6. 7 Marks

x :	0	1	2	3	4	5
y :	6.9897	7.4036	7.7815	8.1291	8.4510	8.7506

b) Using Runge-Kutta method of order four, compute y (2.5) for the equation $\frac{dy}{dx} = \frac{x+y}{x}, y(2) = 2.$ 7 Marks

UNIT-IV

7 a) Obtain the half range sine series for the function $f(x) = \frac{\pi x}{8}(\pi - x)$ in the range $0 \le x \le \pi$. 7 Marks

b) Find the Fourier cosine Transform of $e^{-\frac{x^2}{2}}$. 7 Marks

(OR)

8 a) Find the half range cosine series for the function $f(x) = \cos ax$ where α is not an integer in the range $0 < x < \pi$ 7 Marks

b) Using Fourier integral show that $e^{-x}\cos x = \frac{2}{\pi}\int_0^\infty \frac{\lambda^2+2}{\lambda^2+4}\cos \lambda x d\lambda$ 7 Marks

UNIT-V

9 a) Form the partial differential equation by eliminating arbitrary function from $xyz = f(x + y + z)$. 7 Marks

b) Solve by the method of separation of variables $\frac{\partial^2 u}{\partial x^2} = \frac{\partial u}{\partial y} + 2u$ satisfying u = 0 and $\frac{\partial u}{\partial x} = e^{2y}$, when x=0, for all y. 7 Marks

(OR)

10 a) Form the partial differential equation by eliminating the arbitrary functions f_1 and f_2 from **$z = f_1(y+2x)+f_2(y-3x)$.** 4 Marks

b) Solve one dimensional heat equation by the method of separation of variables $\frac{\partial u}{\partial t} = c^2 \frac{\partial^2 u}{\partial x^2}$. 10 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

SPECIAL FUNCTIONS AND COMPLEX ANALYSIS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Define Beta and Gamma functions and derive the relation between them. 7 Marks

b) Show that $\frac{d}{dx}\left[x^n J_n(x)\right] = x^n J_{n-1}(x)$. 7 Marks

(OR)

2 a) Evaluate $\int_0^1 x^3 \sqrt{1-x}\,dx$ using beta and gamma functions. 7 Marks

b) show that $\frac{d}{dx}\left[J_0(x)\right] = -J_1(x)$ 7 Marks

UNIT-II

3 a) Show that an analytic function of constant modulus is constant. 7 Marks

b) Determine the analytic function $f(z) = u + iv$ given that $3u + 2v = y^2 - x^2 + 16x$. 7 Marks

(OR)

4 a) If **f(z) = u +iv** is an analytic function , find f**(z) if u+ v** = $\frac{x}{x^2 + y^2}$ when f(1)=1. 7 Marks

b) Determine the analytic function whose real part is $e^x(x\cos y - y\sin y)$. 7 Marks

UNIT-III

5 a) Evaluate $\int_0^{1+i} (x - y + ix^2)$ dz along the real axis from z =0 to z = 1 and then along a line parallel to imaginary axis from z = 1 to z = 1 + i. 7 Marks

b) Use Cauchy's and integral formula to evaluate $\oint_c \frac{e^{2z}}{(z+1)^4}$ dz where c is the circle |z| = 2. 7 Marks

(OR)

6 a) Evaluate $\oint_c \frac{\cos \pi z^2}{z^2 - 1}$ dz around a rectangle with vertices $2 \pm i - 2 \pm i$. 7 Marks

b) Expand f(z) = $\frac{1}{z^2 - 3z + 2}$ in the region 7 Marks

(i) |z|>2 (ii) |Z| <1 (iii) 0<|Z-1|<| using Taylor's series

UNIT-IV

7 a) Evaluate $\int_C \frac{(2z+1)^2}{(4z^3 + z)} dz$ where C is the circle | z | = 1. 7 Marks

b) Evaluate $\int_{-\infty}^{\infty} \frac{x^2}{(x^2+1)(x^2+4)}\,dx$ using residue theorem. 7 Marks

(OR)

8 a) Determine the poles and corresponding residues for the function $f(z) = \frac{z^2 - 2z}{(z+1)^2(z^2+1)}$ 7 Marks

b) By the method of residues, evaluate $\int_0^{\pi} \frac{d\theta}{a + b\cos\theta} (a > b > 0)$. 7 Marks

UNIT-V

9 a) Under the transformation **w = 1/z,** find the image of the circle **| z - 2 i | = 2**. 7 Marks

b) Define a Bilinear transformation and evaluate a bilinear transformation which maps the points **1, i, -1** onto the points **i , 0 , - i** . 7 Marks

(OR)

10 a) Show that the bilinear transformation maps circles to circles. 7 Marks

b) Discuss about the transformation ***w = Cos z***. 7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

PROBABILITY AND STATISTICS

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Define random variable, discrete random variable, continuous random variable and conditional probabilities. 7 Marks

b) If x and y are continues random variable, then prove that $E(X+Y)=E(X)+E(Y)$. 7 Marks

(OR)

2 a) State and prove the Baye's theorem. 7 Marks

b) In a class 2% of Boys and 3% of girls are having blue eyes. There are 30% girls in the class. If a student is selected and found that having blue eyes, what is the probability that the student is a girl. 7 Marks

UNIT-II

3 a) Derive the mean and variance of normal distribution. 7 Marks

b) If x is a Poisson variable such that $p(x = 1) = 24\ p(x = 3)$, find the probability $p(x=0)$. 7 Marks

(OR)

4 a) Derive mean and variance of Binomial Distribution. 7 Marks

b) Samples of (n=6) items are drawn at random from the production process which is making 10% defectives. Calculate the probabilities of 0,1,2,3,4,5 and 6 defectives in a sample. 7 Marks

UNIT-III

5 a) Obtain the rank correlation co- efficient for the following data. 7 Marks

X	68	64	75	50	64	80	75	40	55	64
Y	62	58	68	45	81	60	68	48	50	70

b) Derive angle between two Regression lines. 7 Marks

(OR)

6 a) Derive any three properties of Regression lines. 7 Marks

b) Find the correlation co-efficient between x and y variables. 7 Marks

X	9	11	14	15	17	19
Y	7	5	8	9	11	12

UNIT-IV

7 a) Explain Type-I, Type-II errors 7 Marks

b) In 64 randomly selected hours of production, the mean and the standard deviation of the number of acceptance pieces produced by an automatic stamping machine are1.038 and 0.146 At the 0.05 level of significance test whether the mean is greater than 1.000. 7 Marks

(OR)

8 a) Define the Hypothesis, null Hypothesis, alternative Hypothesis Level of significance with suitable example — 7 Marks

b) In a city 400 out of 600 were smokers. Does this information support the conclusion that the majority of men in this city are smokers? (z = 8.3 majority of people are smokers). — 7 Marks

UNIT-V

9 a) A random sample from a company's very extensive files shows that the orders for a certain kind of machinery were filled, respectively in 10, 12, 19, 14, 15, 18, 11 and 13 days. Use the level of significance a = 0.01 to test the claim that on the average such orders are filled in 10.5 days. Assume normality. — 7 Marks

b) The number of automobile accidents per week in a certain community are as follows: 12, 8, 20, 2, 14, 10, 15, 6, 9, 4. Are these frequencies in agreement with the belief that accident conditions were the same during this 10 week period. — 7 Marks

(OR)

10 a) The following tables give the number of aircraft accident that occurred during seven days of the week. Find whether the accidents are uniformly distributed over the week. — 7 Marks

Days	Mon	Tue	Wed	Thu	Fri	Sat
No.of accidents	14	18	12	11	15	14

b) Explain briefly significance between F-Test and T-Test — 7 Marks

CODE No.:14BT30102 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

MECHANICS OF SOLIDS

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 What is strain energy and show that strain energy per unit volume is $f^2/2E$? What is Generalized Hooke's law? Write the governing equations. 14 Marks

(OR)

2 Derive relationship between E, N and K and also differentiate Resilience and Toughness. 14 Marks

UNIT-II

3 Define the SF and BM at a section of a beam. Explain the utility of drawing SF and BM diagrams for a beam. Also obtain relationship between SF and BM. 14 Marks

(OR)

4 A simply supported beam of span 6m carries a clockwise couple of 5kN-m at 2m from left support and another anticlockwise couple of 10kN-m at 4m from left support. The beam carries a UDL of intensity 2kN/m between the couple. Sketch the SFD and BMD. 14 Marks

UNIT-III

5 Three steel plates of width 300mm and thickness 10mm are welded together to form a channel section. What is the moment of resistance of the section if the allowable bending in compression is 60MPa and in tension is 80MPa? 14 Marks

(OR)

6 Sketch the variation of shear stress across the depth of I section of depth 300mm, web thickness 10mm and flange size of 100mm x 10mm. The Flexural shear force action on the section is 200kN. 14 Marks

UNIT-IV

7 Derive Torsion equation and determine the power transmitted by a solid shaft of 120mm diameter rotating at 100 r.p.m., if the maximum shear stress is not to exceed 80 Mpa. The maximum torque is 20% more than its mean value. 14 Marks

(OR)

8 It is required to design a closed coiled helical spring which shall deflect 1 mm under an axial load of 100N at a shear stress of 90Mpa. The spring is to be made of round wire having shear modulus of 0.8×10^5Mpa. The mean diameter of the coil is 10 times that of the coil wire. Find the diameter and length of the wire. 14 Marks

UNIT-V

9 A thick cylinder of steel having an internal diameter of 10cm and an external diameter of 20cm, is subjected to an internal pressure of 80Mpa and an external pressure of 10Mpa. Find the maximum normal and shearing stress in the cylinder and calculate the change of external diameter. Take E= 200Gpa. 14 Marks

(OR)

10 Determine the maximum stress induced in a cylindrical steel strut of length 1.4m and diameter 40mm. The strut is hinged at both its ends and subjected to an axial thrust of 30kN at its ends and a transverse point load of 2kN at the centre. Take $E = 2.08 \times 10^5$ N/mm^2. 14 Marks

❀ ❀ ❀

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

FLUID MECHANICS-I
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Explain the terms i) Dynamic viscosity, ii) Kinematic viscosity. Give their dimensions. Calculate the density, specific weight and weight of one litre of petrol of specific gravity 0.7. 14 Marks

(OR)

2 State and prove the Pascal's law. Determine the total pressure on a circular plate of diameter 1.5m which is placed vertically in water in such a way that the centre of the plate is 3m below the free surface of water. Find the position of centre of pressure also. 14 Marks

UNIT-II

3 If for a two-dimensional potential flow, the velocity potential is given by: $\Phi = 4x\ (3y-4)$, determine the velocity at the point(2, 3). Also determine the value of stream function Ψ at the point (2, 3). 14 Marks

(OR)

4 A pipe 250m long has a slope of 1in 100 and tapers from 1.5m diameter at the higher end to 0.7m at the lower end. The quantity of water flowing is 700 lit/sec. If the pressure at the higher end is 60KPa, find the pressure at the lower end. 14 Marks

UNIT-III

5 List the various minor losses in pipes and derive an expression for the loss of head due to sudden enlargement. A horizontal venturimeter with inlet diameter 20cm and throat diameter 10cm is used to measure the flow of oil of sp.gr.0.8. The discharge of oil through venturimeter is 60 litres/s. Find the reading of the oil-mercury differential manometer. Take $C_d = 0.98$. 14 Marks

(OR)

6 Define an orifice and a mouthpiece. What is the difference between the two? Water is flowing in a rectangular channel 1 m wide and 0.75m deep. Find the discharge over a rectangular weir of crest length 60cm, if the head of water over the crest of weir is 20cm and water from channel flows over the weir. Take $C_d = 0.62$. Neglect end contractions. Take velocity of approach into consideration. 14 Marks

UNIT-IV

7 a) Determine i) the pressure gradient, ii) the shear stress at the two horizontal parallel plates and iii) the discharge per meter width for the laminar flow of oil with a maximum velocity of 2m/sec between two horizontal parallel fixed plates which are 100mm a part. Given $\mu = 2.4525$ N s/m^2. 7 Marks

b) Describe Reynold's experiment to demonstrate the two types of flow. 7 Marks

(OR)

8	a)	Prove that the velocity distribution of viscous flow between two parallel plates when both plates are fixed across a section parabolic in nature. Also prove that maximum velocity is equal to one and half times the average velocity.	7 Marks
	b)	Water is flowing between two large parallel plates which are 2m a part. Determine maximum velocity, pressure drop per unit length and shear stress at walls of the plate, if the average velocity is 0.4m/sec. Take viscosity of water as 0.01 poise.	7 Marks

UNIT-V

9	Discharge Q through a turbine is a function of the turbine speed n, head H, diameter D of the runner, density **ρ** and viscosity **μ** of the fluid and acceleration due to gravity **g**. Find an expression for Q.	14 Marks

(OR)

10	Explain Froude model law and A 1:64 model is constructed of an open channel in concrete which has Manning's N = 0.014. Find the value of N for the model.	14 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

ELECTROMAGNETIC FIELDS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	State and explain Gauss's Law.	7 Marks
	b)	Derive Maxwell's first equation as applied to the electrostatics using Gauss's Law	7 Marks

(OR)

2	a)	Define electric field intensity and electric flux density. Deduce the relation between them.	6 Marks
	b)	It is required to hold four equal point charges each in equilibrium at the corners of a square. Find the point charge which will do this if placed at the centroid of the square.	8 Marks

UNIT-II

3	a)	Derive the expression for EFI due to an Electric dipole.	7 Marks
	b)	Two point charges of 2μC and -2μC are located at (0,0,1) and (0,0,-1) respectively in free space. Find the potential at (0,3,4) m.	7 Marks

(OR)

4	a)	Derive the expression for Potential due to an Electric dipole.	7 Marks
	b)	Derive the expression for capacitance of a parallel plate capacitor without composite Dielectric material.	7 Marks

UNIT-III

5	a)	State and explain Ampere's circuital law in integral and differential forms.	7 Marks
	b)	Explain the concept of magnetic dipole and dipole moment.	7 Marks

(OR)

6	a)	Write Maxwell's Fourth equation in Integral form and explain.	7 Marks
	b)	Obtain the expression for Magnetic Field Intensity due to infinitely long co-axial transmission line by applying Ampere's circuital Law.	7 Marks

UNIT-IV

7	a)	Explain the classification of magnetic materials.	7 Marks
	b)	Derive the expression for magnetic energy density in a magnetic field.	7 Marks

(OR)

8	a)	Calculate the self-inductance per unit length of an infinitely long solenoid.	7 Marks
	b)	Explain about the magnetic boundary conditions.	7 Marks

UNIT-V

9	a)	Explain the concept of polarization.	7 Marks
	b)	Starting from Ampere's circuital law in differential form, derive the corresponding Maxwell's equation in vector differential form for time varying fields.	7 Marks

(OR)

10	a)	Explain the concept of reflection and refraction in magnetic materials.	7 Marks
	b)	State and explain about Faraday's law.	7 Marks

❀ ❀ ❀

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

ELECTRICAL TECHNOLOGY
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the working principle of a DC generator.	6 Marks
	b)	Explain how to obtain the open circuit characteristic of a separately excited DC generator.	8 Marks

(OR)

2	a)	With a neat sketch, explain the operation of a three point starter.	7 Marks
	b)	Explain different types of losses in DC machines.	7 Marks

UNIT-II

3	a)	Derive an EMF equation of a single phase transformer with respect to phasor diagram.	8 Marks
	b)	A single phase (2000/200)V, 50Hz transformer has a net core area of 46cm^2 and a maximum density of 8 wb/m^2. Calculate the number of turns of primary and secondary windings.	6 Marks

(OR)

4	a)	Derive the EMF equation of a single phase transformer.	7 Marks
	b)	Explain the working principle of a single phase transformer.	7 Marks

UNIT-III

5	a)	Derive the relation between phase and line quantities in three phase Delta connection.	6 Marks
	b)	Three equal star connected inductors take 8KW at a power factor of 0.8 lagging, when connected across a 460V, three phase three wire supply. Find the circuit constants of the load per phase.	8 Marks

(OR)

6	a)	Define polyphase system and list out its advantages.	7 Marks
	b)	Derive the relation between phase and line voltages in a star connected system.	7 Marks

UNIT-IV

7		Explain the construction details and the principle of operation of a three phase Induction motor.	14 Marks

(OR)

8	a)	Explain the classification of three phase alternators.	7 Marks
	b)	Derive the EMF equation of an alternator.	7 Marks

UNIT-V

9	a)	"Single phase Induction motor is not self starting". Why?	7 Marks
	b)	Explain the principle of operation of split phase induction motor.	7 Marks

(OR)

10		Explain the construction and the principle of operation of stepper motor. Also give the applications of this motor.	14 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

NETWORK ANALYSIS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) State and explain Kirchhoff's law with suitable examples. 6 Marks

b) Find the voltage across 2Ω resistor in Fig.1b. 8 Marks

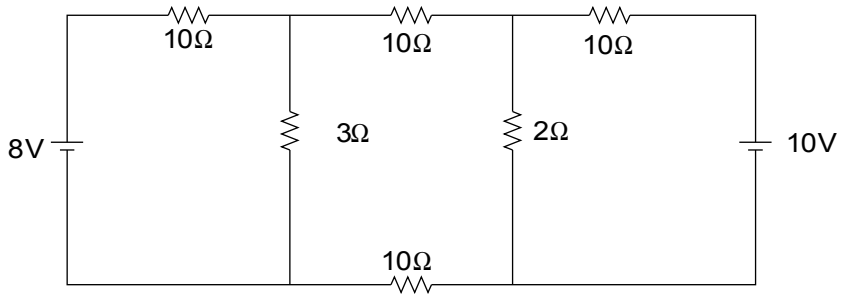


Fig.1b.

(OR)

2 a) Briefly explain about source transformation techniques. 7 Marks

b) Find the voltage across 10Ω resistor in Fig.2b as shown below. 7 Marks

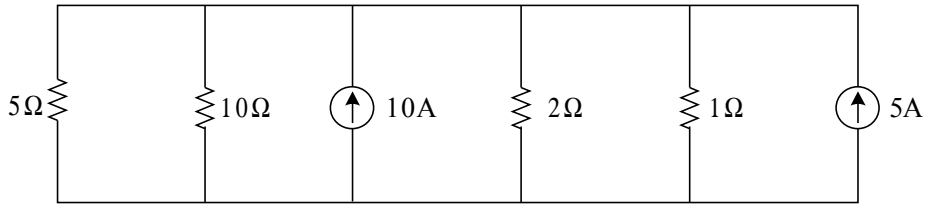


Fig.2b

UNIT-II

3 a) Define resonance and list out its implications. 6 Marks

b) What is locus diagram? Draw and explain current locus diagram for a series RL circuit, with fixed resistance by deriving necessary expressions. 8 Marks

(OR)

4 a) Define the following terms with respect to fundamental sinusoidal AC quantity. 8 Marks
i) Average value. ii) RMS value. iii) Instantaneous value. iv) Form factor.

b) Distinguish between RLC series and parallel resonance circuits. 6 Marks

UNIT-III

5 a) Derive the expressions of Transient response of RL series circuit with DC excitation. 7 Marks

b) Determine the voltage at the terminals of a coil having R = 10Ω and L = 15mH at the instant when the current is 10A and increasing at the rate of 5A/sec. Also find the stored energy in the inductor. 7 Marks

(OR)

6 Derive the expressions of Transient response of RC series circuit with sinusoidal excitation using Laplace transform approach. 14 Marks

UNIT-IV

7 a) Derive the relations of Y-parameters in terms of Z-parameters. 7 Marks

b) Explain about cascade connection of two port networks. 7 Marks

(OR)

8 Define image impedance. Derive the expressions of image impedances of the basic T-Network. 14 Marks

UNIT-V

9 a) State and explain maximum power transfer theorem with a suitable example. 7 Marks

b) Find the load resistance to receive maximum power from the source and also find the maximum power delivered to the load in the circuit shown in Fig.9b. 7 Marks

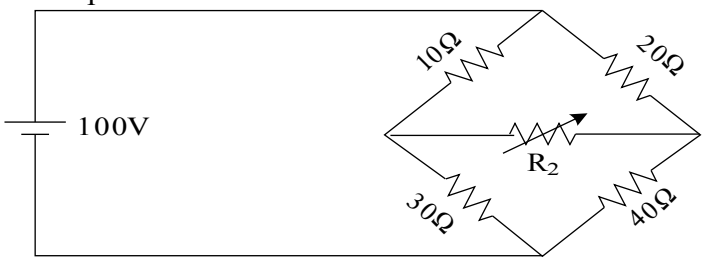


Fig. 9b.

(OR)

10 Obtain the thevenin equivalent for the bridge circuit shown in Fig.10. 14 Marks

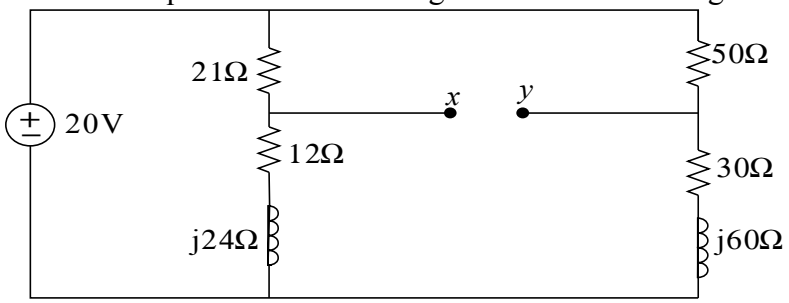


Fig.10.

CODE No.:14BT30303 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

THERMODYNAMICS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	How will you find out whether a given quantity is a thermodynamic property? How are these properties classified? Give examples of each type.	7 Marks
	b)	Explain: i) reversible process. ii) irreversible process. Write important criterion for a process to be reversible.	7 Marks

(OR)

2	a)	Define following: i) Thermo dynamic state. ii) Quasistatic process. iii) Cyclic and non cyclic process.	9 Marks
	b)	Show that the work and heat are path functions.	5 Marks

UNIT-II

3	a)	What is a steady flow process? Write the steady flow energy equation and explain the various terms in it.	7 Marks
	b)	Represent schematically heat engine, heat pump and refrigerator. Give their performance.	7 Marks

(OR)

4	a)	State and prove Carnot's theorem.	6 Marks
	b)	A heat engine is used to drive a heat pump. The heat transfers from the heat engine and from the heat pump are used to heat the water circulating through the radiators of a building. The efficiency of the heat engine is 27% and the COP of the heat pump is 4. Evaluate the ratio of the heat transfer to the circulating water to the heat transfer to the heat engine.	8 Marks

UNIT-III

5	a)	What is irreversibility? Show the gain of entropy in an irreversible process on T-s diagram in the case of steam turbine and compressor.	7 Marks
	b)	Define the term availability. Find an expression for the availability of a closed system.	7 Marks

(OR)

6	a)	Define available and unavailable energy.	4 Marks
	b)	Air enters the heater at 27^0C and leaves at 67^0C, the pressure being constant at 4 bar. The heat source is at 260^0C and the surroundings are at 15^0C. Treating air as a perfect gas find: i) the gain in availability of the air, ii) the effectiveness of the heater. Also calculate the loss due to irreversibilities.	10 Marks

UNIT-IV

7	a)	What are Maxwell relations? Derive them.	7 Marks
	b)	Describe the Mollier chart for steam with the help of a suitable diagram. What is the importance of this diagram in thermodynamic calculations?	7 Marks

(OR)

8	a)	Derive Tds equation when (i) T and V independent (ii) T and P independent.	8 Marks
	b)	Draw and explain phase equilibrium diagram for a pure substance on P-T coordinate. Also indicate different regions on the diagram.	6 Marks

UNIT-V

9	a)	Derive the expression from the air standard efficiency of the diesel cycle in terms of compression ratio, cut off ration and adiabatic index.	7 Marks
	b)	Explain the working principle of Otto cycle with the help of P-V and T-S diagrams.	7 Marks

(OR)

10		Derive an expression for the thermal efficiency of diesel cycle and draw P-V and T-S diagrams.	14 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

PROBABILITY AND STOCHASTIC PROCESSES

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define joint and conditional probabilities.	4 Marks
	b)	When are two events said to be collectively exhaustive? Explain with examples	5 Marks
	c)	Estimate the probability of the card being either red or a king when one card is drawn from a deck of a regular 52 cards	5 Marks

(OR)

2	a)	State and prove multiplication theorem of probability.	6 Marks
	b)	For any two events A and B in a sample space S, if B⊂A then prove that P(A/B)= 1.	8 Marks

UNIT-II

3	a)	State and prove any four properties of probability density function.	6 Marks
	b)	When two dice are thrown, calculate the expected value of the sum of number of points on them.	8 Marks

(OR)

4	a)	State four properties of conditional density function.	7 Marks
	b)	Find the MGF of a Binomial distribution and hence find mean and variance.	7 Marks

UNIT-III

5	a)	Find the skew for Gaussian distributed random variable.	7 Marks
	b)	Define conditional distribution and density function of two random variables X and Y.	7 Marks

(OR)

6	a)	Find the characteristic function for a random variable with density function $f_x(\omega) = x$ for $0 \leq x \leq 1$.	8 Marks
	b)	Define and explain the characteristic function.	6 Marks

UNIT-IV

7	a)	Explain about random processes.	6 Marks
	b)	State and prove mean Ergodic theorem.	8 Marks

(OR)

8	a)	Discuss about Gaussian Random Process and Poisson Random Process.	7 Marks
	b)	Discuss the auto correlation properties of a random process.	7 Marks

UNIT-V

9	a)	Classify noise and explain thermal noise in detail for stochastic processes.	7 Marks
	b)	Explain noise factor and noise figure.	7 Marks

(OR)

10	a)	Define the term interference and list several sources.	7 Marks
	b)	For an amplifier with an output signal power of 10W and an output noise power of 0.01W, determine the signal-to-noise power ratio	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

SEMICONDUCTOR DEVICES AND CIRCUITS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the V-I characteristics of Diode of Diode under forward and reverse bias.	10 Marks
	b)	An **ac** voltage of peak value 20**.**7V is connected in series with a silicon diode and a load resistance of 490Ω. The forward resistance of the diode is 10Ω. Calculate: i) peak current through the diode ii) peak voltage output voltage. What will be these values if the diode is assumed to be ideal?	4 Marks

(OR)

2	a)	Discuss about the temperature dependence of V-I characteristics of PN diode	5 Marks
	b)	Distinguish between transition capacitance and diffusion capacitance of PN junction diode.	4 Marks
	c)	Compare and contrast half-wave and full-wave rectifiers. Mention any three applications of rectifier	5 Marks

UNIT-II

3	a)	Sketch and explain the common base input and output characteristics. How do you draw these curves experimentally?	10 Marks
	b)	Describe the Base-Width modulation.	4 Marks

(OR)

4	a)	Explain how you would locate the operating point using the load line.	7 Marks
	b)	Explain the collector to base bias arrangement and derive at an expression for its stability factor with necessary circuit diagram.	7 Marks

UNIT-III

5	a)	Define h-parameters. How do you determine h-parameters from transistor characteristics?	7 Marks
	b)	Draw the circuit diagram of CB amplifier circuit and its h-parameter equivalent circuit. List the characteristics of a CB amplifier.	7 Marks

(OR)

6	a)	Analyze the CC amplifier using approximate hybrid model.	8 Marks
	b)	Describe the simplified hybrid model.	6 Marks

UNIT-IV

7	a)	Draw the circuit diagram of common source amplifier and derive expression for gain of the amplifier.	7 Marks
	b)	With neat structure, explain the principle of operation of depletion MOSFET.	7 Marks

(OR)

8	a)	Explain the Drain and Transfer characteristics of a JFET.	7 Marks
	b)	With neat diagrams, explain the characteristics of MOSFET in enhancement mode.	7 Marks

UNIT-V

9	a)	Explain the working principle and characteristics of SCR.	7 Marks
	b)	Draw the equivalent circuit of UJT and explain the characteristics.	7 Marks

(OR)

10	a)	Write the applications of UJT.	6 Marks
	b)	Explain the operation of varactor diode.	8 Marks

❀ ❀ ❀

CODE No.:14BT30431 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

ELECTRONIC DEVICES AND CIRCUITS

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain about the characteristics of zener diode.	6 Marks
	b)	What are the specifications of p-n junction diode? Explain how reverse saturation current varies with temperature both in Si and Ge diodes.	8 Marks
		(OR)	
2	a)	Draw the block diagram of a regulated power supply and explain its operation.	7 Marks
	b)	Write the diode equation and discuss the effect of temperature on diode current.	7 Marks

UNIT-II

3	a)	Explain how transistor is used an amplifier.	7 Marks
	b)	Derive the relationship between α and β.	7 Marks
		(OR)	
4	a)	Derive an expression for the stability factor of a collector to base bias circuit.	7 Marks
	b)	Explain about measurement of h-parameters from transistor characteristics in CE configuration.	7 Marks

UNIT-III

5	a)	Explain the Drain and Transfer characteristics of a JFET.	7 Marks
	b)	With neat sketch, explain the characteristics of MOSFET in enhancement mode.	7 Marks
		(OR)	
6	a)	Draw the circuit diagram of common source amplifier and formulate the equation for gain of the amplifier.	7 Marks
	b)	With neat structure, explain the principle of operation of depletion MOSFET.	7 Marks

UNIT-IV

7	a)	With a neat sketch, explain the working of RC phase shift oscillator.	8 Marks
	b)	What is meant by feedback? What are the effects of negative feedback?	6 Marks
		(OR)	
8	a)	Explain in detail about the different feedback topologies.	6 Marks
	b)	Derive an expression for frequency of oscillation for RC phase shift oscillator.	8 Marks

UNIT-V

9	a)	Describe working principle of an SCR with V-I characteristics.	7 Marks
	b)	Compare and contrast between SCR and TRIAC.	7 Marks
		(OR)	
10	a)	Explain the construction and working of Tunnel diode.	8 Marks
	b)	What are the applications of varactor diode?	6 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

DIGITAL LOGIC DESIGN

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Convert the given Binary number 11011101 in: i) BCD ii) HEXADECIMAL iii) DECIMAL	7 Marks
	b)	What is a 2's complement? Explain it with an example.	7 Marks
		(OR)	
2	a)	What is canonical form? Explain different canonical forms with an example.	7 Marks
	b)	Draw the logic diagram for the given Boolean expression $F = A\overline{B} + \overline{C}D + ABC$.	7 Marks

UNIT-II

3	a)	What is Karnaugh map? Explain its concept with example	4 Marks
	b)	Simplify the Boolean Function $F(A,B,C,D) = \Pi\,(0,2,5,6,7,9,11,14)$ using karnaugh map.	10 Marks
		(OR)	
4	a)	Explain don't-care condition.	4 Marks
	b)	Implement AND, OR, NOT gates using Universal gates	6 Marks
	c)	Describe EX-OR function with an example.	4 Marks

UNIT-III

5		Construct a 8 x 1 multiplexer for the Boolean function F(A,B,C,D)=Σ(1,3,4,11,12,13,14,15).	14 Marks
		(OR)	
6	a)	Design a priority 4-bit priority Encoder circuit	8 Marks
	b)	Write the truth table for a full adder. Explain the operation of a binary adder-subtract or with a block diagram.	6 Marks

UNIT-IV

7	a)	Compare combinational circuit with sequential circuit.	7 Marks
	b)	What is Flip-Flop? Explain about J-K, D-Flip-Flop.	7 Marks
		(OR)	
8		Implement 4-bit Synchronous counter with a neat diagram.	14 Marks

UNIT-V

9	a)	Describe the functioning of SRAM and DRAM in detail.	7 Marks
	b)	Write short notes on Sequential Programmable Devices.	7 Marks
		(OR)	
10		With a block diagram, explain the functioning of a PAL.	14 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

DISCRETE MATHEMATICAL STRUCTURES

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Show the following equivalence $P\rightarrow(Q \vee R) \Leftrightarrow (P\rightarrow Q) \vee (P\rightarrow R)$	7 Marks
	b)	Express the product of sum canonical form of the formula $(P \wedge Q) \vee (\neg P \vee Q \wedge R)$	7 Marks

(OR)

2	a)	Show that S∪R is tautologically implied by (P∪Q) ∩(P→R) ∩(Q→S).	7 Marks
	b)	Explain about free and bounded variables in detail in the context of predicate logic.	7 Marks

UNIT-II

3	a)	Define partial and total order of relations.	5 Marks
	b)	Design a Hasse diagram of {1, 2, 3, 6, 12} under the partial ordering relation 'divided'.	9 Marks

(OR)

4	a)	Show that f (x, y) = x y is a primitive recursive function.	7 Marks
	b)	Let X={1, 2, 3, 4, 5, 6, 7} and R={(x,y)/x-y is divisible by 3 } in X. Design an Equivalence Relation.	7 Marks

UNIT-III

5	a)	Define a semi group and a monoid. Give an example for a semi group but not monoid.	7 Marks
	b)	Prove that a Group in which every element has its own inverse, is abelian group.	7 Marks

(OR)

6	a)	**(G,*)** is a group and (a,b)€G then show that $(a * b)^{-1} = b^{-1} * a^{-1}$.	7 Marks
	b)	Every finite group of order "n" is isomorphic to a permutation group of degree 'n' prove it.	7 Marks

UNIT-IV

7	a)	In $(1 + x^5 + x^9)^{10}$ find the coefficient of x^{23} and x^{32}.	7 Marks
	b)	Compute the number of six letter combinations of the letter of English alphabet. If no letter is to appear in the combination more than 2 times.	7 Marks

(OR)

8	a)	Solve the Recurrence Relation $a_n - 9a_{n-1} - 26a_{n-2} - 24a_{n-3} = 0$ where $a_0=0$, $a_1=1$ and $a_2=10$.	7 Marks
	b)	How many ways can 5 day's be chosen from each of the 12 months of an ordinary year of 365 day's.	7 Marks

UNIT-V

9	a)	Show that the complete graph k_s is non planar.	7 Marks
	b)	Explain BFS algorithm with example.	7 Marks

(OR)

10	a)	State and prove Grin berg's theorem.	7 Marks
	b)	Show that the complete Bipartite graph of $k_{3,3}$ is non planar.	7 Marks

CODE No.:14BT3BS02 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations January – 2022

SPECIAL FUNCTIONS AND COMPLEX ANALYSIS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Define beta and gamma functions and establish a relationship between them. 7 Marks

b) State Bessels differential equation and its solution $J_n(x)$. Show that $J_{1/2}(x) = \sqrt{\frac{2}{\pi x}} \sin x$. 7 Marks

(OR)

2 a) Show that $2^{2n-1}\Gamma(n)\left(n+\frac{1}{2}\right) = \Gamma(2n)\sqrt{\pi}$. 7 Marks

b) Show that $J_{3/2}(x) = \sqrt{\frac{2}{\pi x}}\left(\frac{1}{x}\sin x - \cos x\right)$. 7 Marks

UNIT-II

3 a) Show that $\left(\frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2}\right)\log|f'(z)| = 0$, where $f(z)$ is analytic function. 7 Marks

b) Find the an analytic function $f(z) = u + iv$, given that $u - v = (x - y)(x^2 + 4xy + y^2)$. 7 Marks

(OR)

4 a) Show that the function $f(z) = \sqrt{|xy|}$ is not analytic at the origin, although C-R equations are satisfied at that point. 7 Marks

b) Find the analytic function $f(z) = u + iv$ if $u = a(1 + Cos\theta)$. 7 Marks

UNIT-III

5 a) Evaluate $\int_0^{1+i} (x^2 - iy)\,dz$ along the path (i) y=x (ii) $y= x^2$. 7 Marks

b) Evaluate $\oint_c \frac{\cos \pi z^2}{(z-1)(z-2)}\,dz$ where c is the circle |z|=3 using Cauchy's integral Formula. 7 Marks

(OR)

6 a) Evaluate $\oint_c \frac{\sin \pi z^2 + \cos \pi z^2}{(z-1)(z-2)}\,dz$ where C is the circle |z| = 4. 7 Marks

b) Expand $\frac{1}{z^2 - 3z + 2}$ in the region (i) |z| < 1, (ii) | z|> 2 (iii) 1<|z|<2 using Taylor's series. 7 Marks

UNIT-IV

7 a) Determine the poles of the function and the corresponding residues $\frac{z+1}{z^2(z-2)}$. 7 Marks

b) Evaluate $\int_0^{2\pi} \frac{Sin3\theta}{5-3\cos\theta} d\theta$ using Residue theorem. 7 Marks

(OR)

8 a) Calculate the value of $\oint_c \frac{z-3}{z^2+2z+5}$ dz where C is the circle |z+1+i |=2. 7 Marks

b) Evaluate $\int_0^{\infty} \frac{dx}{\left(x^2+1\right)^2}$. 7 Marks

UNIT-V

9 a) Under the Transformation W = $\frac{1}{z}$ find the image of |z-2i|=2. 7 Marks

b) Find the Bilinear Transformation which maps the points z = 1, i, - 1 in to the points w =1,0,-i. 7 Marks

(OR)

10 a) Find the image of the following curve under the mapping w = 1/z. 7 Marks

b) Discuss the Transformation $w = e^z$. 7 Marks

CODE No.:14BT3BS03 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations January – 2022

PROBABILITY AND STATISTICS

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Define random variable, discrete random variable, continuous random variable and conditional probabilities. 7 Marks

b) If x and y are continues random variable, then prove that $E(X+Y)=E(X)+E(Y)$. 7 Marks

(OR)

2 a) If *x* and *y* are continuous random variable, then prove that $E(XY)=E(X)E(Y)$. 7 Marks

b) A Probability cure y = f (x) has a range from 0 to $\propto$ if f (x) = e^{-x}, find the mean, variance and the third moment. 7 Marks

UNIT-II

3 a) Derive mean and variance of Binomial Distribution. 7 Marks

b) Samples of (n=6) items are drawn at random from the production process which is making 10% defectives, Calculate the probabilities of 0,1,2,3,4,5 and 6 defectives in a sample. 7 Marks

(OR)

4 a) Derive the mean and variance of normal distribution. 7 Marks

b) If x is a Poisson variable such that $p(x = 1) = 24\ p(x = 3)$, find the probability $p(x=0)$. 7 Marks

UNIT-III

5 a) Explain briefly the following content. 7 Marks
i) Statistical quality control.
ii) Specification limits, X, R, P and np.

b) Calculation co-efficient of correlation between *x* and *y*. 7 Marks

x	9	8	7	6	5	4	3	2	1
y	15	16	14	13	11	12	10	8	9

(OR)

6 a) Obtain the rank correlation co- efficient for the following data. 7 Marks

X	68	64	75	50	64	80	75	40	55	64
Y	62	58	68	45	81	60	68	48	50	70

b) Derive angle between two Regression lines. 7 Marks

UNIT-IV

7 a) Define the following. 8 Marks
i) Sampling distribution. ii) Standard error.
iii) Errors in sampling. iv) Level of significance.

b) According to the norms established for a mechanical aptitude test, persons who are 18 years old have an average height of 73.2 with a standard deviation of 8.6. If 4 randomly selected persons of that age averaged 76.7, test the hypothesis m = 73.2 against the alternative hypothesis m > 73.2 at the 0.01 level of significance. 6 Marks

(OR)

8 a) A manufacturer claimed that atleast 95% of the equipment which he supplied to factory conformed to specifications. An examination of a sample of 200 pieces of equipment revealed that 18 were faulty. Test his claim at 5% level of significance. 7 Marks

b) Samples of students were drawn from two universities and from their weights in kilograms, mean and standard deviations are calculated and shown below. Make a large sample test to test the significance of the difference between the means. 7 Marks

	Mean	S.D.	Size of the sample
University A	55	10	400
University B	57	15	100

UNIT-V

9 a) Two horses A and B were tested according to the time (in seconds) to run a particular track with the following results. 7 Marks

Horse A	28	30	32	33	33	29	34
Horse B	29	30	30	24	27	29	-

Examine whether the two horses have the same running capacity.

b) Pumpkins were grown under two exponential conditions. Two random samples of 11 and 9 pumpkins show the sample standard deviations of their weights as 0.8 and 0.5 respectively. Assuming that the weight distributions are normal, test hypothesis that true variances are equal. 7 Marks

(OR)

10 a) A sample of 26 bulbs gives a mean life of 990 hours with a S.D of 20 hours. The manufacturer claims that the mean life of bulbs is 1000 hours. Examine whether the sample is up to the standard. 7 Marks

b) To compare two kinds of bumper guards, 6 of each kind were mounted on a car and then the car was run into a concrete wall. The following are the costs of repairs. 7 Marks

Guard 1	107	148	123	165	102	119
Guard 2	134	115	112	151	133	129

Use the 0.01 level of significance to determine whether the difference between two sample means is significant.

CODE No.:14BT30104 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations January - 2022

FLUID MECHANICS-I

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	Differentiate between: (i) Liquids and gases. (ii) Real fluids and ideal fluids. One litre of crude oil weighs 9.6N. Calculate its specific weight, density and specific gravity.	14 Marks

(OR)

2	State and Prove the Pascal's law. Determine the total pressure on a circular plate of diameter 1.5m which is placed vertically in water in such a way that the centre of the plate is 3m below the free surface of water. Find the position of centre of pressure also.	14 Marks

UNIT-II

3	The stream function in a two dimensional flow is $\psi = 3x-2y+5xy$. Verify whether the flow is irrotational. Determine the direction of stream line at a point (1, -2). Determine also the expression for the velocity potential.	14 Marks

(OR)

4	A pipe 250 m long has a slope of 1 in 100 and tapers from 1.5 m diameter at the higher end to 0.7 m at the lower end. The quantity of water flowing is 700 lit / sec. If the pressure at the higher end is 60KPa, find the pressure at the lower end.	14 Marks

UNIT-III

5	Derive an expression for loss of head due to sudden enlargement and find the head lost due to friction in a pipe of diameter 360 mm and length 60 m through which water is flowing at a velocity of 2.5 m/s using Darcy formula and Chezy's formula for which C=60. Assume kinematic viscosity as 0.01 stoke.	14 Marks

(OR)

6	Differentiate between notch and weir and A discharge of 0.06 cumec was measured over right angled notch. While measuring the head over the notch, an error of 1.5 mm was made. Determine the percentage error in the discharge, if coefficient of discharge of notch is 0.6.	14 Marks

UNIT-IV

7	Describe the Reynolds's experiment with a neat sketch. Explain how would you distinguish between hydro dynamically smooth and rough boundaries.	14 Marks

(OR)

8	A laminar flow is taking place in a pipe of diameter 200 mm. The maximum velocity is 1.5 m/s. Find the mean velocity and the radius at which this occurs. Also calculate the velocity at 4cm from the wall of the pipe.	14 Marks

UNIT-V

9	Explain the procedure for solving problem by Buckingham's π theorem in briefly.	14 Marks

(OR)

10	Explain the following. i) Geometric Similarity. ii) Kinematic Similarity. iii) Dynamic Similarity	14 Marks

CODE No.:14BT30202 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations January – 2022

DC MACHINES

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Discuss the principle of operation of DC machine as a motor and as a generator.	7 Marks
	b)	Derive the expression of EMF generated in case of generator from the first principles.	7 Marks

(OR)

2		With the help of sketches, describe the main construction and working principle of a DC generator.	14 Marks

UNIT-II

3	a)	Define the terms: back pitch, front pitch with reference to dc armature windings.	4 Marks
	b)	Draw the developed view of 24-slot, 2-pole lap connected armature winding clearly indicating position of brushes and commutator.	10 Marks

(OR)

4	a)	Derive EMF equation of a DC generator.	7 Marks
	b)	The lap wound armature of a 4-pole generator armature has 51-slots, each slot having 20 conductors. Compute the EMF generated in the machine when driven at 1500 r.p.m, if useful flux per pole is 0.01Wb.	4 Marks
	c)	Write significance of dummy coils used in a wave wound armature.	3 Marks

UNIT-III

5	a)	Write the reasons and remedial measures for failure of voltage build up in a self excited DC generator.	7 Marks
	b)	Define critical field resistance. Explain the procedure for determination of critical field resistance of DC shunt generator experimentally.	7 Marks

(OR)

6	a)	Why the parallel operation of series generators is unstable. What remedial measures are taken for its successful operation?	7 Marks
	b)	A shunt generator has an induced voltage of 254 V. When the machine is laded, the terminal voltage drops down to 240 V. Neglecting armature reaction, determine the load current, if the armature resistance is 0.04Ω, and the field circuit resistance is 24Ω.	7 Marks

UNIT-IV

7	a)	Discuss various speed control methods of DC series motor.	7 Marks
	b)	A 230 V DC shunt motor drives a load at 900 r.p.m drawing a current of 30 A. The resistance of armature is 0.4Ω. The torque of load is proportional to speed. Calculate the resistance to inserted into armature circuit to get 600 r.p.m	7 Marks

(OR)

8	a)	Draw the circuit diagram of Ward-Leonard method of speed control of DC motor and explain how speed can be controlled. Mention its applications	7 Marks
	b)	Two series motors run at 650 r.p.m and 750 r.p.m respectively when taking a current of 60 A from 600 V supply. Total resistance of each motor is 0.3Ω. If two motors are mechanically coupled and put in series across 600 V supply, at what speed the set will run when still taking a current of 60A?	7 Marks

UNIT-V

9 a) Explain the experimental procedure to conduct Hopkinson's test with help of circuit diagram. 7 Marks

b) Field's test on two mechanically coupled DC series machines gave the following data: 7 Marks

	Armature voltage (V)	Field winding drop (V)	Armature Current (A)
Motor	500	38	50
Generator	400	36	38

Resistance of each armature winding is 0.2Ω. Calculate efficiency of each machine at this load.

(OR)

10 a) Explain how different components of stray losses can be separated using an experiment. 7 Marks

b) Describe a suitable method of determining efficiency of DC series motor. 7 Marks

CODE No.:14BT30236 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations January – 2022

FOUNDATIONS OF ELECTRICAL ENGINEERING
[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define and explain about ideal and practical current, voltage sources.	6 Marks
	b)	Derive the relationship to express three delta connected resistances into equivalent star.	8 Marks

(OR)

2	a)	State and explain Ohms law. What are its limitations?	7 Marks
	b)	A capacitance of 40.0 μF has a voltage described as follows: for $0 > t > 2$ ms, $v = 35 \times 10^3 t$ (V). Determine i, p, and w at t = 1.5 ms.	7 Marks

UNIT-II

3	a)	Explain how average value and **rms** value can be determined for a given wave form.	7 Marks
	b)	A RL circuit with R=35Ω and L=0.3mH has a voltage v = 135 sin 270t (V). Find the power p and the **rms** power p_{rms} over one cycle.	7 Marks

(OR)

4	a)	Define the terms complex power, real power and reactive power.	7 Marks
	b)	Explain why **j** operator is used in circuit analysis.	7 Marks

UNIT-III

5	a)	Derive the mathematical expression for generated **e.m.f** of a DC generator.	8 Marks
	b)	In a particular DC machine if P=8, Z=400 N=300 r.p.m and Φ=100mWb. Calculate generated **e.m.f** for wave winding.	6 Marks

(OR)

6	a)	Explain different types of DC motor.	8 Marks
	b)	From the first principles calculate the torque developed by a 4 pole dc motor having 1150 lap connected conductors the armature current is 19 A and the flux per pole is 25 mWb.	6 Marks

UNIT-IV

7	a)	Explain the principle and operation of single phase transformer.	8 Marks
	b)	Draw the phasor diagram for the single phase transformer operating on NO-LOAD.	6 Marks

(OR)

8	a)	Explain the principle of operation of 3-phase Induction Motor.	8 Marks
	b)	Discuss about the principle operation of AC Servo Motor.	6 Marks

UNIT-V

9	a)	Differentiate between open loop and closed loop control systems.	7 Marks
	b)	Mention some examples for time variant and time invariant systems.	7 Marks

(OR)

10	a)	Explain the classification of control systems.	7 Marks
	b)	What is the effect of feedback on the output of the given control system?	7 Marks

CODE No.:14BT30302 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations January – 2022

MATERIALS SCIENCE AND METALLURGY
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Show that the packing efficiency of FCC and HCP unit cells are 74%.	7 Marks
	b)	Mark the planes (100), (110) and (111) in a cubic lattice. Mark all the directions that can exist on these planes and write the corresponding Miller indices of direction.	7 Marks

(OR)

2	a)	Define atomic packing factor. Calculate atomic packing factor for FCC.	7 Marks
	b)	Explain Henry's intercept method in grain size measurement.	7 Marks

UNIT-II

3	a)	Explain the terms: i) Eutectic. ii) Eutectoid.	7 Marks
	b)	Draw the schematic microstructures of slowly cooled eutectoid steel and hypo-eutectoid steel.	7 Marks

(OR)

4	a)	Differentiate between peritectic transformation and peritectoid transformation.	7 Marks
	b)	Explain effect of alloying elements on iron-iron carbon system.	7 Marks

UNIT-III

5	a)	Compose the following heat treatment process. i) Annealing. ii) Normalizing.	7 Marks
	b)	Compare and contrast any two surface hardening methods.	7 Marks

(OR)

6	a)	Explain about TTT diagrams.	7 Marks
	b)	Write about Cryogenic treatment of alloys.	7 Marks

UNIT-IV

7	a)	What are the common alloying elements other than carbon in alloy cast iron? Explain.	7 Marks
	b)	Describe the composition, properties and uses of Tool steels?	7 Marks

(OR)

8	a)	How you will classify cast iron? Explain structure and properties of each cast iron.	7 Marks
	b)	Explain briefly about super alloys.	7 Marks

UNIT-V

9	a)	Write the advantages and limitations of powder metallurgy.	6 Marks
	b)	Explain about Sintering process in detail.	8 Marks

(OR)

10	a)	Discuss about metal matrix composite.	7 Marks
	b)	State any five applications of polymer matrix composite.	7 Marks

CODE No.:14BT30401 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations January – 2022

PROBABILITY AND STOCHASTIC PROCESSES

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) A Supplier receives 1000 shirts from a textile company. The probability that a shirt is defective is 10^{-2}. Find the probability that there will be more than five shirts are defective. 7 Marks

b) State and prove Baye's theorem. 7 Marks

(OR)

2 a) When are two events said to be mutually exclusive? Explain with an example. 7 Marks

b) When two dice are thrown, calculate the probability of getting the sums of 10 or 11. 7 Marks

UNIT-II

3 a) State and prove any four properties of probability density function. 6 Marks

b) When two dice are thrown, calculate the expected value of the sum of number of points on them. 8 Marks

(OR)

4 a) Explain Conditional density and list the properties of conditional density. 6 Marks

b) The sample space for an experiment is S = {0, 1, 2, 5, 6}. List all the possible values of the following random variables; (i) X = 2s (ii) X = $5s^2$ -1. 8 Marks

UNIT-III

5 a) Find the characteristic function for a random variable with density function $f_X(\omega) = x$ for $0 \leq x \leq 1$. 8 Marks

b) Define and explain the characteristic function. 6 Marks

(OR)

6 a) Find the skew for Gaussian distributed random variable. 7 Marks

b) Define conditional distribution and density function of two random variables X and Y. 7 Marks

UNIT-IV

7 a) Explain about random processes. 6 Marks

b) State and prove mean Ergodic theorem. 8 Marks

(OR)

8 a) Explain in detail the Gaussian random Processes. 7 Marks

b) Discuss auto correlation function and its properties. 7 Marks

UNIT-V

9 a) Define the term interference and list several sources. 7 Marks

b) For an amplifier with an output signal power of 10W and an output noise power of 0.01W ,determine the signal-to-noise power ratio. 7 Marks

(OR)

10 a) Define the noise factor and noise figure and describe their significance. 5 Marks

b) For a non ideal amplifier and the following parameters, determine: 9 Marks

i) input signal-to-noise ratio (dB). ii) output signal-to-noise ratio (dB).
iii) Noise factor and noise figure.

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations January - 2022

SEMICONDUCTOR DEVICES AND CIRCUITS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Mention five diode characteristic parameters usually mentioned in specification sheets and explain their significance.	4 Marks
	b)	Describe the breakdown mechanism s in Semiconductor diodes.	10 Marks
		(OR)	
2	a)	Draw the circuit diagram of FWR with inductor filter and explain the circuit operation.	7 Marks
	b)	A full wave rectified voltage of 18V peak is applied across 500mF capacitor filter. Calculate the ripple and DC voltages if the load makes a current of 100mA.	7 Marks

UNIT-II

3	a)	Describe the constructional features of a BJT. How do you distinguish the emitter and the collector regions? Draw the circuit symbols of PNP and NPN transistors and indicate the directions of currents.	8 Marks
	b)	Discuss the parameters related to the Transistor current components.	6 Marks
		(OR)	
4	a)	Explain about base-width modulation with relevant waveforms	7 Marks
	b)	Why transistor is considered as current control device? Explain.	7 Marks

UNIT-III

5	a)	Define h-parameters. How do you determine h-parameters from transistor characteristics?	7 Marks
	b)	Draw the circuit diagram of CB amplifier circuit and its h-parameter equivalent circuit. List the characteristics of a CB amplifier.	7 Marks
		(OR)	
6	a)	Find the expressions for voltage gain, current gain, Input impedance and output impedances of CC amplifier using simplified hybrid model.	7 Marks
	b)	Compare BJT and JFET with reference to the construction, working principle, performance and applications.	7 Marks

UNIT-IV

7	a)	Explain with neat diagram the structure and characteristics of Depletion MOSFET.	7 Marks
	b)	Explain how FET acts as Voltage Variable Resistor.	7 Marks
		(OR)	
8	a)	Draw the circuit diagram of common source amplifier and derive expression for gain of the amplifier.	7 Marks
	b)	With neat structure, explain the principle of operation of depletion MOSFET.	7 Marks

UNIT-V

9	a)	Explain the working principle and characteristics of SCR.	7 Marks
	b)	Draw the equivalent circuit of UJT and explain the characteristics.	7 Marks
		(OR)	
10	a)	Describe the construction and working of Varactor Diode.	7 Marks
	b)	Analyze the tunneling phenomenon in a Tunnel Diode using energy band diagrams.	7 Marks

❀ ❀ ❀

CODE No.:14BT3BS01 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations July – 2022

MATRICES AND NUMERICAL METHODS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Test for consistency and then solve the system of equations $x + 2y - z = 3$, $3x - y + 2z = 1$, $2x - 2y + 3z = 2$, $x - y + z = -1$. 7 Marks

b) State Cayley - Hamilton theorem and using it find the inverse of the matrix 7 Marks

$$\begin{bmatrix} 1 & 0 & 2 \\ 0 & 1 & 2 \\ 1 & 2 & 0 \end{bmatrix}$$

(OR)

2 a) Discuss the solutions of the system of equations 7 Marks

$2x + 3ky + (3k + 4)z = 0;\ x + (k + 4)y + (4k + 2)z = 0;\ x + 2(k + 1)y + (3k + 4)z = 0$

for all possible real values of k.

b) Calculate the eigen values and eigen vectors of the matrix 7 Marks

$$\begin{bmatrix} 6 & -2 & 2 \\ -2 & 3 & -1 \\ 2 & -1 & 3 \end{bmatrix}$$

UNIT-II

3 a) Evaluate the real root that lies between 2 and 3 for the equation $x \log_{10} x = 1.2$ by bisection method. 7 Marks

b) Evaluate y(10), by lagranges interpolation formula, from the following table. 7 Marks

x	5	6	9	11
y	12	13	14	16

(OR)

4 a) Estimate a real root of the equation $e^x \sin x = 1$, using Regula – Falsi method. 7 Marks

b) Using the method of least squares calculate the values of a and b such that $y = ae^{bx}$ that fits the following data: 7 Marks

x	0.0	0.5	1.0	1.5	2.0	2.5
y	0.10	0.45	2.15	9.15	40.35	180.75

UNIT-III

5 a) Evaluate $\int_o^n o^z \sqrt{\cos\theta}\, d\theta$ using Simpson's 1/3 rule by dividing the range into six equal parts. 7 Marks

b) Given that $\frac{dy}{dx} = y - x$, $y(0) = 2$. Find $y(0.2)$ using Runge-Kutta method of order 4 taking h= 0.1 7 Marks

(OR)

6 a) Using Euler method, solve for y at x=2 from $dy/dx=3x^2+1$, and y=1 when x=0. Taking step size h=0.25. 7 Marks

b) From the following data, find the area bounded by the curve and the x-axis from x=7.47 to x=7.52. 7 Marks

x	7.47	7.48	7.49	7.50	7.51	7.52
y=f(x)	1.93	1.95	1.98	2.01	2.03	2.06

UNIT-IV

7 a) Obtain the Fourier series for $f(x) = \pi x$, in $0 \le x \le 2$. 7 Marks

b) Find the Fourier sine transform of $\frac{x}{a^2 + x^2}, x \ge 0$. 7 Marks

(OR)

8 a) Obtain the half –range sine and cosine series for e^x in $(0, \pi)$. 7 Marks

b) Find the Fourier integral representation of $f(x) = \begin{cases} 1 - x^2 & for \ |x| \le 1 \\ 0 & for \ |x| > 1 \end{cases}$ 7 Marks

UNIT-V

9 a) Form the partial differential equation by eliminating arbitrary function from $xyz = f(x + y + z)$. 7 Marks

b) Solve by the method of separation of variables $\frac{\partial^2 u}{\partial x^2} = \frac{\partial u}{\partial y} + 2u$ satisfying u = 0 and $\frac{\partial u}{\partial x} = e^{2y}$, when x=0, for all y. 7 Marks

(OR)

10 a) Form the partial differential equation by eliminating the arbitrary functions f_1 and f_2 from $z = x f_1(x + t) + f_2(x + t)$. 4 Marks

b) A tightly stretched string with fixed end points $x = 0$ and $x = 1$ is initially in a position given by $y = y_0 \sin^3(\pi x)$. If it is released from rest from this position, find the displacement $y(x, t)$, using variable separable method. 10 Marks

❀ ❀ ❀

CODE No.:14BT3BS02 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations July – 2022

SPECIAL FUNCTIONS AND COMPLEX ANALYSIS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Define beta and gamma functions and show that $\beta(m,n) = \int_0^1 \frac{x^{m-1} + x^{n-1}}{(1+x)^{m+n}}\,dx$ 7 Marks

b) Show that $\frac{n}{x}J_n(x) - J_n'(x) = J_{n+1}(x)$ 7 Marks

(OR)

2 a) Evaluate $\int_0^1 x^3\sqrt{1-xdx}$ using beta and gamma functions. 7 Marks

b) show that $\frac{d}{dx}[J_0(x)] = -J_1(x)$ 7 Marks

UNIT-II

3 a) Define continuity of a function f(z) at the point z = z_0 and show that the function $f(z) = \frac{\bar{z}}{z}$ is not continuous at z = 0 7 Marks

b) Construct a most general analytic function with $v = e^x$ (xsin y + y cos y) as its imaginary part. 7 Marks

(OR)

4 a) Define an analytic function and show that the function $f(z) = e^{-z^{-4}}$, $z \neq 0$ and f(0)=0 is not analytic at z = 0, though C-R equations are satisfied at origin. 7 Marks

b) Define a harmonic function and show that the real and imaginary parts of an analytic functions are harmonic**.** 7 Marks

UNIT-III

5 a) Evaluate $\int_C (z^2 + 3z + 2)dz$ where c is the arc of the cycloid $x = a(\theta + Sin\theta)$, $y = a(1 - Cos\theta)$ between the points (0, 0) and ($a\pi$, 2a). 7 Marks

b) Show that $\int_C (z+1)dz = 0$ where c is the boundary of the square whose vertices at the points $z = 0$, $z = 1$, $z = 1+i$, $z = i$. 7 Marks

(OR)

6 a) Find the Laurent series of $\frac{7z-2}{(z+1)z(z-2)}$ in the annulus $1 < |z+1| < 3$. 7 Marks

b) Evaluate $\int_C \frac{\cos\pi z^2}{(z-1)(z-2)^3}dz$ where C is $|z| = 3$, by using Cauchy's integral formula. 7 Marks

UNIT-IV

7 a) Determine the poles of the function and the corresponding residues $\frac{z+1}{z^2(z-2)}$. 7 Marks

b) Evaluate $\int_0^{2\pi} \frac{Sin3\theta}{5-3\cos\theta} d\theta$ using Residue theorem. 7 Marks

(OR)

8 a) Evaluate $\int_C \frac{(2z+1)^2}{(4z^3+z)} dz$ where C is the circle $|z| = 1$. 7 Marks

b) Evaluate $\int_{-\infty}^{\infty} \frac{x^2}{(x^2+1)(x^2+4)} dx$ using residue theorem. 7 Marks

UNIT-V

9 a) If $w = \frac{1+iz}{1-iz}$, find the image of $|z| < 1$. 7 Marks

b) Find the bilinear transformation which maps the points (-1, 0, 1) in to the points $(0, i, 3i)$. Also find the fixed points of the transformation. 7 Marks

(OR)

10 a) Find the image of the circle $|z| = 2$ under the transformation $w = z + 3 + 2i$. 7 Marks

b) Discuss the transformation $w = \cos z$. 7 Marks

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations July – 2022

MECHANICS OF SOLIDS
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Derive an expression for the elongation of a axially loaded bar for the following conditions: 14 Marks

i) Tapering bar having diameter D_1 at one end and D_2 at the other end.

ii) Rectangular tapering bar having depth D_1 at one end and D_2 at the other end with constant width B.

(OR)

2 Derive expression for the elongation of the following bars under its own weight. Density of the material is γ. 14 Marks

i) Prismatic bar. ii) Conical bar fixed at base.

UNIT-II

3 Define the SF and BM at a section of a beam. Explain the utility of drawing SF and BM diagrams for a beam. Also obtain relationship between SF and BM. 14 Marks

(OR)

4 A cantilever of 2m long is loaded with a UDL of 2kN/m which run over a length of 1.35m from the free end. It also carries a point load of 2.5kN at a distance of 0.25m from the free end. Draw the SF and BM diagrams for the cantilever. 14 Marks

UNIT-III

5 Three steel, plates of width 300mm and thickness 10mm are welded together to form a channel section. What is the moment of resistance of the section if the allowable bending in compression is 60MPa and in tension is 80MPa? 14 Marks

(OR)

6 Sketch the variation of shear stress across the depth of an I section of depth 300mm, web thickness 10mm and flange size of 100mm x 10mm. The Flexural shear force action on the section is 200kN. 14 Marks

UNIT-IV

7 Design the diameter of a steel shaft to transmit 150 kW power at 150 r.p.m. The maximum shear stress is limited to 60 MPa the angle of twist is limited to 2.5 degrees in its length of 3m. Rigidity modulus of steel is 80 GPa 14 Marks

(OR)

8 Derive Torsion equation and determine the power transmitted by a solid shaft of 120 mm diameter rotating at 100 r.p.m., if the maximum shear stress is not to exceed 80 Mpa. The maximum torque is 20% more than its mean value. 14 Marks

UNIT-V

9 A thin steel cylindrical shell of thickness 14mm, 1m diameter and 3.25m long is carrying a fluid at a pressure of 1.6N/mm². Find the change in dimensions of the cylinder. 14 Marks

(OR)

10 A steel cylinder of 350mm external diameter is to be shrunk over another cylinder of internal diameter 200mm. After shrinkage the diameter at the junction is 300mm and the radial pressure at the junction is 30N/mm². Find the original difference in radii at the junction. 14 Marks

❀ ❀ ❀

CODE No.:14BT30104 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations July - 2022

FLUID MECHANICS-I

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Define the terms Specific weight, Capillarity, Viscosity and Specific volume and the specific gravity of a liquid is 3.0. What are its specific weight, specific mass and specific volume? 14 Marks

(OR)

2 State and Prove the Pascal's law. Determine the total pressure on a circular plate of diameter 1.5m which is placed vertically in water in such a way that the centre of the plate is 3m below the free surface of water. Find the position of centre of pressure also. 14 Marks

UNIT-II

3 Derive continuity equation for one dimensional flow and list out uses and limitations of flow net. 14 Marks

(OR)

4 250 litres/s of water is flowing in a pipe having a diameter of 300mm. If the pipe is bent by 135° (that is change from initial to final direction is 135°), find the magnitude and direction of the resultant force on the bend. The pressure of water flowing is 39.24 N/cm^2. 14 Marks

UNIT-III

5 A pipe of diameter 20cm and length 2000m connects two reservoirs, having difference in water levels as 20m. Determine the discharge through the pipe. If an additional pipe of diameter 20cm and length 1200m is attached to the last 1200m length of the existing pipe, find the increase in the discharge. Take f=0.015 and neglect minor losses. 14 Marks

(OR)

6 Determine the rate of low of water through a pipe of diameter 20cm and length 50m when one end of the pipe is connected to a tank and other end of the pipe is open to the atmosphere. The pipe is horizontal and the height of water in the tank is 4 m above the centre of the pipe. Consider all minor losses and take f = 0.009 in the formula $h_f = 4flv^2/2gD$. 14 Marks

UNIT-IV

7 Describe the Reynolds's experiment with a neat sketch. Explain how would you distinguish between hydro dynamically smooth and rough boundaries. 14 Marks

(OR)

8 A laminar flow is taking place in a pipe of diameter 200mm. The maximum velocity is 1.5m/s. Find the mean velocity and the radius at which this occurs. Also calculate the velocity at 4cm from the wall of the pipe. 14 Marks

UNIT-V

9 Discharge Q through a turbine is a function of the turbine speed n, head H, diameter D of the runner, density ρ and viscosity μ of the fluid and acceleration due to gravity g. Find an expression for Q. 14 Marks

(OR)

10 Explain Froude model law and A 1:64 model is constructed of an open channel in concrete which has Manning's N=0.014. Find the value of N for the model. 14 Marks

❀ ❀ ❀

CODE No.:14BT30302 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations July – 2022

MATERIALS SCIENCE AND METALLURGY
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define atomic packing factor. Calculate atomic packing factor for FCC.	7 Marks
	b)	Explain Henry's intercept method in grain size measurement.	7 Marks
		(OR)	
2	a)	Why FCC metals are in general more ductile than BCC and HCP metals? Explain.	7 Marks
	b)	Explain primary and secondary bonding in materials.	7 Marks

UNIT-II

3	a)	Discuss about Allotropy of iron.	6 Marks
	b)	Write the effect of alloying elements on Iron-Iron carbon system.	8 Marks
		(OR)	
4	a)	Differentiate between peritectic transformation and peritectoid transformation.	9 Marks
	b)	Explain effect of alloying elements on iron-iron carbon system.	5 Marks

UNIT-III

5	a)	"Hardening of steel is always followed by tempering" Give reasons.	6 Marks
	b)	What is carburizing? Why is it done?	8 Marks
		(OR)	
6	a)	Explain about TTT diagrams.	8 Marks
	b)	Write about Cryogenic treatment of alloys.	6 Marks

UNIT-IV

7	a)	What are the common alloying elements other than carbon in low alloy steels? Explain.	7 Marks
	b)	What is brass? Describe the composition, properties and uses of important types of brasses.	7 Marks
		(OR)	
8	a)	Explain why titanium alloys are used in turbines.	7 Marks
	b)	List any five applications of aluminum alloys.	7 Marks

UNIT-V

9	a)	Write the advantages and limitations of powder metallurgy.	6 Marks
	b)	Explain about Sintering process in detail.	8 Marks
		(OR)	
10	a)	Discuss about metal matrix composite.	7 Marks
	b)	State any five applications of polymer matrix composite.	7 Marks

CODE No.:14BT30402 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations July – 2022

SEMICONDUCTOR DEVICES AND CIRCUITS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the V-I characteristics of PN diode and Zener diode. And differentiate them.	7 Marks
	b)	Draw the circuit of a full wave rectifier circuit with L section filter and derive the expression for ripple factor.	7 Marks
		(OR)	
2	a)	Mention five diode characteristic parameters usually mentioned in specification sheets and explain their significance.	4 Marks
	b)	Describe the breakdown mechanism s in Semiconductor diodes.	10 Marks

UNIT-II

3	a)	Explain about base-width modulation with relevant waveforms	5 Marks
	b)	Why transistor is considered as current control device? Explain.	5 Marks
	c)	What is the condition for thermal stability?	4 Marks
		(OR)	
4	a)	Sketch the input and output characteristics of a transistor in CB configuration.	7 Marks
	b)	Explain how a transistor works as an amplifier.	7 Marks

UNIT-III

5		Derive the expressions for voltage gain, current gain, Input impedance, output impedance, voltage gain with respect to source and current gain with respect to source for generalized transistor amplifier at low frequencies.	14 Marks
		(OR)	
6	a)	Analyse the CB amplifier using approximate hybrid model.	8 Marks
	b)	Write the concept of Millers theorem and mention applications.	6 Marks

UNIT-IV

7	a)	Explain the pinch-off voltage,V-I characteristics of JFET .	6 Marks
	b)	With neat diagram, explain the operation of MOSFET in Enhancement mode.	8 Marks
		(OR)	
8	a)	Explain the common drain amplifier and derive expression for gain of the amplifier.	8 Marks
	b)	Write the comparisons of BJT and JFET.	6 Marks

UNIT-V

9	a)	Explain the operation of tunnel diode and draw its equivalent circuit.	8 Marks
	b)	With neat diagram, explain about varactor diode.	6 Marks
		(OR)	
10	a)	Explain the working principle and characteristics of SCR.	7 Marks
	b)	Draw the equivalent circuit of UJT and explain the characteristics.	7 Marks

CODE No.: 16BT3BS01 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

PROBABILITY DISTRIBUTIONS AND STATISTICAL METHODS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Let $F(x)$ be the distribution function of a random variable X given by CO4 7 Marks

$$F(x) = \begin{cases} cx^3, when\ 0 \le x < 3 \\ 1, when x \ge 3 \\ 0, when x < 0 \end{cases}$$

Determine i) probability density function. ii) value of c. iii) Mean.
iv) P(X>1) of a random variable X.

b) Let $f(x) = 3x^2$, when $0 \le x \le 1$ be the probability density function of a continuous variable X. By analyzing the functions, estimate the value of *'a'* and *'b'* such that CO2 7 Marks

(i) $P(X \le a) = P(X > a)$ (ii) $P(X > b) = 0.05$.

(OR)

2 a) A player tosses 3 fair coins. He wins Rs. 500, if 3 heads appear ; Rs. 300, if 2 heads appear ; Rs. 100 if 1 head occur. On the other hand, he loses Rs. 1500, if 3 tails occur. Calculate the expected gain of the player. CO4 7 Marks

b) Probability density function of random variable X is CO1 7 Marks

$$f(x) = \begin{cases} \frac{1}{2}\sin x, for\ 0 \le x \le \pi \\ 0, \quad elsewhere \end{cases}$$

Estimate the mean and median of the distribution and also find $P(0 \le X \le \frac{\pi}{2})$.

UNIT-II

3 a) Construct a binomial distribution and find expected frequencies to the following data CO3 7 Marks

X	0	1	2	3	4	5	6
f	13	25	52	58	32	16	4

b) Average number of accidents on any day on a national highway is 1.8. Determine the probability that the numbers of accidents is CO4 7 Marks

i) at least one. (ii) at most one.

(OR)

4 a) Calculate the probability that at most 5 defective components will be found in a lot of 200. Experience shows that 2 % of such components are defective. Also estimate the probability of more than five defective components. CO4 7 Marks

b) The marks obtained in statistics in a certain examination found to be normally distributed. If 15% of students got greater than or equal to 60 marks, 40 % of students got less than 30 marks, Estimate the mean and standard deviation. CO4 7 Marks

UNIT-III

5 The following are the figures of defectives in 22 lots each containing 2000 rubber belts 25, 430, 216, 341, 225, 322, 280, 306, 337, 305, 356, 402, 216, 264, 126, 409, 193, 326, 280, 389, 451, 420. Design control chart for the fraction defectives and comment on the state of control of the process. CO3 14 Marks

(OR)

6 Calculate the correlation coefficient and regression lines for the following data CO4 14 Marks

X	2	4	6	8	10	12	14
Y	4	2	5	10	4	11	12

UNIT-IV

7 a) In a sample of 500 from a village in Andhra Pradesh, 280 are found to be rice eaters and the rest are wheat eaters. Examine that both the articles are equally popular or not. Justify. CO2 7 Marks

b) A random sample of size 32 from a normal population having the mean 47.5 and the standard deviation 8.4. Examine whether the information support or refuse the claim, that the mean of the population is 42.5. CO2 7 Marks

(OR)

8 a) At a certain date in a large city 400 out of a random sample of 500 men were found to be smokers. After the heavy taxation on tobacco another sample of 600 men in the same city included 400 smokers. Examine whether decrease in the proportion of smokers significant. CO2 7 Marks

b) A sample of 500 members has a mean 2.5 cms and standard deviation 2.21 cms. By relevant statistical technique check whether the sample has drawn from the population with a mean 3 cms and standard deviation 2.21 cms. CO5 7 Marks

UNIT-V

9 a) A sample of 26 bulbs give a mean life of 990 hours with a standard deviation of 20 hours. The manufacturer claims that the mean life of bulbs is 1000 hours. Discuss whether the sample is up to the standard or not. CO2 7 Marks

b) The measurements of the output of two units have given the following results. Assuming that both samples have been obtained from the normal population at 10% significance level, test whether the two populations have the same variance. CO4 7 Marks

Unit-A	14.1	10.1	14.7	13.7	14.0
Unit-B	14	14.5	13.7	12.7	14.1

(OR)

10 4 coins were tossed 160 times and the following results were obtained. CO4 14 Marks

No. of Heads :	0	1	2	3	4
Observed frequencies:	17	52	54	31	6

Under the assumption that coins are unbiased, find the expected frequencies of 0,1,2,3, or 4 heads, and test the goodness of fit ($\alpha = 0.05$).

❀ ❀ ❀

CODE No.: 16BT3BS02 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

SPECIAL FUNCTIONS AND COMPLEX ANALYSIS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define gamma function and using it evaluate the value of $\Gamma\left(\frac{1}{2}\right)$.	CO1. CO4	7 Marks
	b)	Evaluate the integral $\int_0^{\pi/2} \sqrt{\tan\theta} + \sqrt{\cot\theta}$.	CO4	7 Marks
		(OR)		
2	a)	Show that $J_{-n}(x) = (-1)^n J_n(x)$ where n is a positive integer.	CO4	7 Marks
	b)	Establish the relation $x J_n'(x) = n J_n(x) - x J_{n+1}(x)$.	CO4	7 Marks

UNIT-II

3		Define an analytic function and construct an analytic function $f(z) = u + iv$ given that $u - v = (x - y)(x^2 + 4xy + y^2)$	CO1, CO3	14 Marks
		(OR)		
4		Applying Milne-Thomson Technique, construct an analytic function of the form $f(z) = u + iv$ whose imaginary part is $e^x(x\cos y - y\sin y)$.	CO3, CO5	14 Marks

UNIT-III

5		Write Cauchy's theorem and verify it for the function $f(z) = z + 1$over the boundary of the square with vertices $z = 0$, $z = 1$, $z = 1 + i$, $z = i$.	CO1, CO4	14 Marks
		(OR)		
6	a)	Construct a Taylor's series for $f(z) = \frac{e^z}{z(z+1)}$ about the point z = 2.	CO3	7 Marks
	b)	Evaluate contour integral $\int_c \frac{\sin\pi z^2 + \cos\pi z^2}{(z-1)(z-2)} dz$ where c is the circle | z | = 3 using Cauchy's Integral formula.	CO4	7 Marks

UNIT-IV

7	a)	Define pole of a function. Evaluate the product of poles of the function $f(z) = \frac{z^2}{(z-1)(z-2)^2}$ at $z = 1, 2$.	CO1, CO4	7 Marks
	b)	Show that $\int_0^{2\pi} \frac{d\theta}{2+\cos\theta} = \frac{2\pi}{\sqrt{3}}$ using complex variable technique.	CO5	7 Marks
		(OR)		
8	a)	Calculate the value of $\oint_c \frac{z-3}{z^2+2z+5} dz$ where C is the circle $\lvert z+1+i \rvert = 2$.	CO4	7 Marks
	b)	Evaluate the integral $\int_0^{\infty} \frac{dx}{(1+x^2)^2}$ by using the technique of finding residues.	CO5	7 Marks

UNIT-V

9	a)	Define a Bilinear transformation and show that Bilinear transformation preserves cross ratio of four points.	CO1, CO4	4 Marks
	b)	What is the difference between isogonal and conformal transformations and illustrate with an example.	CO4	6 Marks
	c)	Construct bilinear transformation whose invariant points are 1, i and which maps 0 onto –1.	CO3	4 Marks

(OR)

10	a)	On applying the transformation $w = 1/z$ show that the hyperbola $x^2 - y^2 = 1$, maps onto the lemniscate $\rho^2 = \cos 2\phi$.	CO4	7 Marks
	b)	Construct a bilinear the transformation which maps the points $-1, i, 1$ of the $z-$ plane onto $1, i, -1$ of the $w-$ plane respectively	CO3	7 Marks

❀ ❀ ❀

CODE No.: 16BT3HS01 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

ENVIRONMENTAL STUDIES

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Compare renewable and non-renewable resources. Give examples.	CO2	7 Marks
	b)	Why is it necessary to create environmental awareness?	CO4	7 Marks
		(OR)		
2	a)	List the merits and demerits of wind energy.	CO2	7 Marks
	b)	What are the major causes for mining? Give solution to solve this problem.	CO4	7 Marks

UNIT-II

3	a)	What are the biotic and abiotic components of an ecosystem?	CO1	7 Marks
	b)	How can you as an individual conserve biodiversity?	CO7	7 Marks
		(OR)		
4	a)	Write the role of biodiversity in addressing new millennium challenges.	CO4	7 Marks
	b)	What is meant by alpha, beta and gamma richness? Discuss giving examples.	CO1	7 Marks

UNIT-III

5		Examine the characteristics of hazardous and non-hazardous waste and explain the ill effects of hazardous waste how do you manage them.	CO3	14 Marks
		(OR)		
6	a)	State how acid rain does is formed and what are the adverse effects on environment.	CO2	7 Marks
	b)	Enumerate the techniques to manage the surface and groundwater resources.	CO5	7 Marks

UNIT-IV

7	a)	"Population, consumerism and waste production are interrelated" comment.	CO2	7 Marks
	b)	Which are the agents responsible for ozone depletion?	CO1	7 Marks
		(OR)		
8		Discuss the silent features of Forest (Conservation) Act and water (Prevention and Control of Pollution) Act.	CO8	14 Marks

UNIT-V

9	a)	Discuss about role of information technology in environment and human health.	CO1	7 Marks
	b)	What will be the impact when many migrants come into the city?	CO6	7 Marks
		(OR)		
10		Visit to a local industrial polluted area and prepare a document.	CO9	14 Marks

❀ ❀ ❀

CODE No.: 16BT3HS02 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

MANAGERIAL ECONOMICS AND PRINCIPLES OF ACCOUNTANCY
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	"Demand for diamonds is exceptional and violates law of demand," Elaborate.	CO2, CO3	14 Marks
	(OR)		
2	Analyze and suggest a suitable demand forecasting technique for a new and highly technical product being launched by a company.	CO2, CO3	14 Marks

UNIT-II

3	Highlight the "Cost-Volume-Profit" relationship with the help of neat graph.	CO1, CO2	14 Marks
	(OR)		
4	Determine: i) B.E.P. ii) Sales required to earn a profit of Rs.40,000/-. iii) BEP, when fixed cost increases by Rs.10,000/-. iv) BEP, when variable cost increases by Rs.20 per unit. Selling Price per unit Rs.200/- Variable Cost per unit Rs.50/- Fixed Cost Rs.1,00,000/-	CO2, CO5	14 Marks

UNIT-III

5	Distinguish between Price Discrimination and Product Differentiation.	CO2	14 Marks
	(OR)		
6	Discuss the following. i) Objectives of Pricing. ii) Overpricing and Under pricing. iii) Pricing Policy.	CO1	14 Marks

UNIT-IV

7	From the following transactions pass necessary journal entries in the books of Meghana. 2019 Jan. 1 Meghana commenced a business with Rs. 5, 00, 000. Jan. 6 Bought goods from Hari for cash Rs. 1, 24, 500. Jan. 17 Bought goods by Suresh Rs. 1, 48, 400 Jan. 21 Commission paid to Giri Rs. 3, 600. Jan. 31 Salaries paid through cheque Rs. 21, 800.	CO2, CO3	14 Marks
	(OR)		
8	Discuss briefly various sources of capital for a business.	CO1	14 Marks

UNIT-V

9 From the following Trail Balance of Shukla prepare Trading, Profit and Loss Account for the year ending 31st March, 2019 and Balance sheet as on the date. CO4, CO5, CO6 — 14 Marks

Particulars	Debit(Rs)	Credit(Rs)
Buildings	20,000	
Capital A/c		60,000
Purchases & Sales	10,000	30,000
Stock on 1-04-2018	5,000	
Debtors & Creditors	12,000	6,000
Drawings	4,000	
Sales returns & purchase Returns	2,000	500
Freight	2,500	
Office Salaries	8,000	
Wages	1,500	
Postage and Telegrams	1,000	
Machinery	15,000	
bills Receivable, Bills Payable	8,000	2,000
Advertisement	2,000	
Cash in hand	3,500	
Loose Tools	4,000	
Total	**98,500**	**98,500**

Adjustments:

i) Closing Stock was valued at Rs 6,000/-

ii) Depreciation Buildings by 10% and Loose Tools are evalued at Rs 3,500/-

(OR)

10 The trial balance of a firm on 31.12.2018 is as follows. Prepare final accounts of this firm. CO4, CO5, CO6 — 14 Marks

Particulars	Debit (Rs)	Credit (Rs)
Capital		1,00,000
Plant and Machinery	1,60,000	
Sales		354,000
Returns	2,000	1,500
Opening Stock	700	
Bank charges	150	
Sundry Debtors & Creditors	90,000	51,600
Furniture	60,000	
Wages	20,000	
Salaries	13,600	
Carriage inwards	1,500	
Carriage outwards	2,400	
bad debts provision		1,050
rent, rates, taxes	20,000	
Advertisements	4,000	
cash in hand	1,800	
cash at bank	12,000	
Purchases	1,20,000	

Adjustments:

i) Closing stock Rs.17,000/-

ii) Depreciate Pant 6% p.a

iii) Bad debts provision to be adjusted to Rs. 1,000/-

CODE No.:16BT30101 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

CONSTRUCTION PLANNING AND PROJECT MANAGEMENT
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Prepare a generalized report on stages of planning by different agencies.	CO4	7 Marks
	b)	Bring out the importance of safety in construction projects.	CO6	7 Marks
		(OR)		
2	a)	Explain the need of 'labor legislation' in construction industry.	CO8	8 Marks
	b)	Define Organization and list out various types of organizations.	CO1	6 Marks

UNIT-II

3	a)	Describe concreting plant and equipment.	CO1	7 Marks
	b)	Enumerate the various types of material costs.	CO1	7 Marks
		(OR)		
4	a)	Explain the objectives of resource management in construction industry.	CO9	7 Marks
	b)	Explain the environmental problems associated with the hauling equipment.	CO7	7 Marks

UNIT-III

5	a)	Describe various phases of project management.	CO1	7 Marks
	b)	Distinguish between PERT and CPM networks and explain the circumstances under which one is preferred over the other.	CO2	7 Marks
		(OR)		
6	a)	How can milestone chart be developed into a network?	CO4	7 Marks
	b)	Draw the bar chart for 'finalization of designs and work order for a building project'.	CO4	7 Marks

Activity	Description	Time for completion (Weeks)
A	Site selection and survey	5
B	Design	7
C	Preparation of Drawings	4
D	Preparation of specifications and tender document	3
E	Tendering	5
F	Selection of contractor	1
G	Award of work order	1

UNIT-IV

7	a)	Define an event and activity. Differentiate clearly between the two.	CO1	6 Marks
	b)	Discuss various rules for providing dummies in a network and what are redundant dummies.	CO1	8 Marks
		(OR)		
8	a)	Write a note on development of networks.	CO1	8 Marks
	b)	Differentiate between activity oriented diagram and event oriented diagram.	CO2	6 Marks

UNIT-V

9 a) If the expected time along the critical path of a project is 27 weeks and the standard deviation along it is 6 weeks, determine the probability of completing the project within a) 21 weeks, b) 24 weeks, c) 36 weeks. CO2 6 Marks

b) The details of a network are given below where the duration is in days. CO2 8 Marks

Activity	t_o	t_m	t_p
1-2	2	5	8
1-3	1	4	7
2-3	0	0	0
2-4	2	4	6
2-6	5	7	12
3-4	3	5	10
3-5	3	6	9
4-5	7	6	10
4-6	2	5	8
5-6	2	4	6

Determine the critical path and project completion time.

(OR)

10 Determine the minimum cost and optimum duration for the following project. CO9 14 Marks

The data of each activity of network is given in the table. Indirect cost is Rs.4000/week.

Activity	Normal Time (Month)	Cost (Rs.)	Crash Time (Month)	Cost (Rs.)
0-1	3	5000	2	5500
1-3	14	10000	11	13000
1-2	7	6000	4	9000
2-3	9	11000	6	18000
3-4	4	9000	3	12000
4-5	3	6000	2	7800

CODE No.:16BT30102 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

FLUID MECHANICS AND HYDRAULIC MACHINERY

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define density, specific gravity, viscosity and vapour pressure. Calculate the specific weight, specific mass, specific volume and specific gravity of a liquid having a volume of $6m^3$ and weight of 44kN	CO1	7 Marks
	b)	Describe Newton's law of viscosity and a plate 0.05 mm distant from a fixed plate moves at 1.2 m/s and requires a force of 2.2 N/m^2 to maintain this speed. Find the viscosity of the fluid between the plates	CO2	7 Marks
		(OR)		
2	a)	A plate having an area of 0.6 sq.m is sliding down the inclined plane at 30 degrees to the horizontal with a velocity of 0.36 m/s. There is a cushion of fluid 1.8 mm thick between the plane and the plate. Find the viscosity of the fluid if the weight of the plate is 280 N. Also calculate kinematic viscosity.	CO2	7 Marks
	b)	A 400 mm diameter shaft is rotating at 200 r.p.m in a bearing of length 120 mm. If the thickness of oil film is 1.5 mm and the dynamic viscosity of the oil is 0.7 $N.s/m^2$, determine torque required to overcome friction in bearing and power utilized in overcoming viscous resistance.	CO2	7 Marks

UNIT-II

3	a)	Explain the description of fluid motion and list out types of fluid flows with an example.	CO1	8 Marks
	b)	Describe types of flow lines and velocity for a two dimensional flow field is given by $\mathbf{V = (3 + 2xy + 4t^2)\, i + (xy^2 + 3t)\, j}$. Find the velocity and acceleration at a point (1,2) after 2 sec.	CO2	6 Marks
		(OR)		
4	a)	Derive continuity equation in three dimensional forms in Cartesian system.	CO1	7 Marks
	b)	A pipe (1) 450 mm diameter branches into two pipes (2 and 3) of diameters 300mm and 200mm respectively. If the average velocity in 450mm diameter pipe is 3 m/s find discharge through 450mm diameter pipe and velocity in 200mm diameter pipe if the average velocity in 300mm pipe is 2.5 m/s.	CO2	7 Marks

UNIT-III

5	a)	Explain Reynolds's experiment with a neat sketch and list out the characteristics of laminar flow.	CO1	7 Marks
	b)	Derive an expression for flow of viscous fluid in circular pipes with assumptions.	CO1	7 Marks
		(OR)		
6	a)	An oil of viscosity 9 poise and specific gravity 0.9 is flowing through a horizontal pipe of 60 mm diameter. If the pressure drop in 100 m length of the pipe is 1800 kN/m^2, determine rate of flow of oil, centre line velocity, total frictional drag over 100 m length and power required to maintain the flow.	CO5	7 Marks
	b)	Define Couette flow and describe flow of viscous fluid between two parallel plates.	CO1	7 Marks

UNIT-IV

7	a)	List out types of channels and compare open channel flow and pipe flow. What is the purpose of providing bed slope in open channels?	CO1	7 Marks
	b)	Classify flows and define energy and momentum correction factors. Hydraulic jump forms at the downstream end of spillway causing 18 cumec discharges. If the depth before jump is 0.8 m, determine the depth after the jump and energy loss.	CO2	7 Marks

(OR)

8	a)	Discuss the distribution of velocity in an open channel flow. Which velocity is called relative velocity? How does an open channel flow differ from pressure flow?	CO1	7 Marks
	b)	A trapezoidal channel with base width 3m and side slope 2H: 1V carries a discharge of 10 cumec at a depth of 1.5m under uniform flow condition. The longitudinal slope of the channel is 0.001. Compute the average shear stress on the boundary and also compute the Manning's N value.	CO3	7 Marks

UNIT-V

9	a)	State Impulse Momentum Principle. Derive an expression for impact of jet of liquid on a fixed vertical plate. Find the force exerted by a 4cm diameter water jet directed against a flat plate held normal to the jet, if the jet is discharging 60 litres of water per second.	CO2	7 Marks
	b)	Derive an expression for impact of jet of liquid on an inclined plate moving in the direction of the jet of liquid. A jet of water 120mm in diameter and moving with a velocity of 25 m/s strikes normally on a flat plate. Determine the force exerted on the plate and the work done when the plate is stationary, the plate is moving with a velocity of 8 m/s in the direction of the jet, and the plate is moving with a velocity of 8 m/s towards the jet.	CO2	7 Marks

(OR)

10	a)	Derive an expression for impact of jet on a fixed curved plate. A jet of water 5 cm in diameter and moving with a velocity of 15 m/s impinges on a series of vanes moving with a velocity of 5 m/s. Determine force on the plates. Work done per second and Efficiency of the jet.	CO2	7 Marks
	b)	Obtain an expression for force exerted by the jet of water on a inclined plane which is at rest. Prove that the maximum efficiency is 50% when a jet of liquid strikes of plates fixed to the periphery of a wheel.	CO2	7 Marks

CODE No.:16BT30103 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

MECHANICS OF SOLIDS

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 A compound bar consist of a central steel strip 25 mm wide and 6.4 mm thick placed between two strips of brass each 25 mm wide and 't' mm thick. The strips are firmly fixed together to form a compound bar of rectangular section 20 mm wide and (2t + 6.4) mm thick. Determine CO5 14 Marks

i) The thickness of the brass strips which will make the apparent modulus of elasticity of compound bar 1.57×10^5 N/mm^2 and

ii) The maximum axial pull the bar can then carry if the stress is not to exceed 157 N/mm^2, in either the brass or steel.

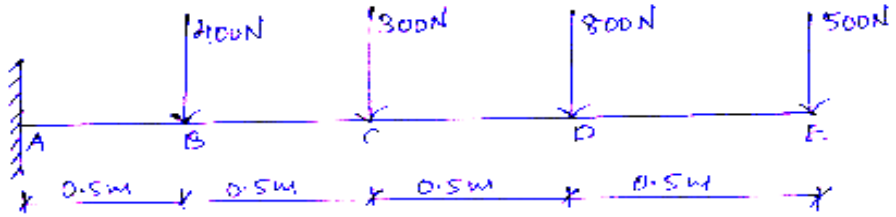
Take the values of E for steel and brass as 2.07×10^5 N/mm^2 and 1.14×10^5 N/mm^2 respectively.

(OR)

2 Define resilience. Derive the maximum stress intensity on a member of length 'l' and uniform cross sectional area 'A' when a load of magnitude 'P' is applied gradually and suddenly on the member and identify the difference in these two cases. CO1 14 Marks

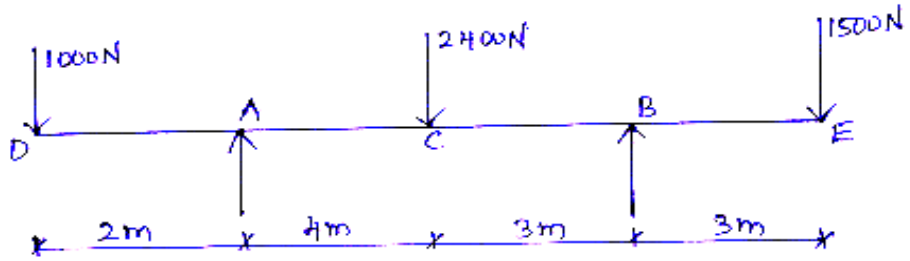
UNIT-II

3 Determine the maximum shear force and bending moment of a Cantilever beam shown in the figure and draw SFD and BMD. CO2 14 Marks



(OR)

4 Determine the maximum shear force and bending moment of a Cantilever beam shown in the figure and draw SFD and BMD. CO2 14 Marks



UNIT-III

5 a) Derive the maximum shear stress intensity for a solid circular section. CO1 10 Marks

b) A cast iron cantilever of length 2.5m fails when a load of 3kN applied at the free end. Determine the stress at failure if the section of the cantilever is of 40mm x 60mm. CO2 4 Marks

(OR)

6		A load of 75 kN is carried by a column of Cast iron. The external and internal diameters are 200mm and 18 mm respectively, if the eccentricity of the load is 35mm, find: i) The maximum and minimum stress intensities. ii) Upto what eccentricity there is no tensile stress in the column.	CO2	14 Marks

UNIT-IV

7	a)	A solid shaft of 200mm diameter has the same cross section area as that of the hollow shaft of the same material with inside diameter of 150mm. Find the ratio of the power transmitted by the two shafts at the same speed.	CO6	7 Marks
	b)	A solid shaft is 100mm in diameter. It transmits 110 kW at 200 r.p.m, find the maximum intensity of shear stress induced and the angle of twist for a length of 6m. C=$8x10^4$ N/mm^2.	CO1	7 Marks
		(OR)		
8	a)	A composite spring has two closed coiled springs connected in series; one spring has 12 coils of a mean diameter of 25mm and wire diameter 2.5mm. Find the wire diameter of the other spring, if it has 15 coils of mean diameter 40 mm. The stiffness of the composite spring is 1.5 kN/m. Determine the greatest load that can be carried by the composite spring and the corresponding extension if maximum stress is 250 MN/m^2. Take C= 80 GN/m^2.	CO4	7 Marks
	b)	A helical spring B is placed inside the coil of a second helical spring A, having the same number of coils and free axial length and of same material. The two springs are compressed by an axial load of 210 N which is shared between them. The mean coil diameters of A and B are 90mm and 60mm and the wire diameters are 12mm and 7mm respectively. Calculate the load taken and the maximum stress in each spring.	CO2	7 Marks

UNIT-V

9		A cylindrical shell 4m long which is closed at the ends has an internal diameter of 1m and a wall thickness of 15mm. Calculate the circumferential and the longitudinal stresses induced and also the change in dimension of the shell if it is subjected to an internal pressure of 1.5MN/m^2.	CO5	14 Marks
		(OR)		
10		The external diameter of steel collar is 240mm and internal diameter is decreased by 0.15mm when shrunk on to a solid steel shaft of 150mm diameter. Find : i) Radial pressure between the collar and the shaft. ii) Circumferential stress at the inner surface of the tube. iii) Reduction in diameter of the shaft. Take: E= 205 GN/m^2, and μ= 0.304.	CO6	14 Marks

❀ ❀ ❀

CODE No.:16BT30104 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

SURVEYING
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) What are the sources of errors in chaining? What precautions would guard against them? CO6 6 Marks

b) The length of a Survey line was measured with a 20m chain and was found to be equal to 1200m. As a check the length was again measured with a 25m chain and was found to be 1212m. On comparing the 20m chain with the test gauge, it was found to be 1 decimeter too long. Find the actual length of the 25m chain used. CO2 8 Marks

(OR)

2 a) What are offsets? What are the types of offsets and method of taking offsets? CO1 10 Marks

b) The following perpendicular offsets were taken from a chain line to a hedge CO2 4 Marks

Chainage (m)	0	15	30	45	60	70	80	100	120	140
Offsets (m)	7.6	8.5	10.7	12.8	10.6	9.5	8.3	7.9	6.4	4.4

Calculate the area between the survey line, the hedge and the end offsets:
i) Trapezoidal rule. ii) Simpson's rule.

UNIT-II

3 a) State the advantages and disadvantages of plane table survey. CO1 6 Marks

b) The following staff readings were observed successively with a level. The instrument having been moved after second, fifth and eighth readings. 0.675, 1.230, 0.750, 2.565, 2.225, 1.935, 1.835, 3.220, 3.115, 2.875. The first staff reading was taken with a staff held on a bench mark of reduced level +100.00. Collect and enter the readings in the level book form and identify the reduced levels of all the points. CO4 8 Marks

(OR)

4 Explain the tracing paper method of solving the Three Point problem. What is the practical utility of the solution to Three Point problem in the field? CO1 14 Marks

UNIT-III

5 A closed traverse ABCDEA was run in the counter clockwise direction, and the following data were obtained. CO3 14 Marks

Line	Length (m)	Included angle
AB	186	Angle A = $118^0\ 20^1$
BC	164	Angle B = $82^0\ 10^1$
CD	303	Angle C = $130^0\ 00^1$
DE	162	Angle D = $73^0\ 44^1$
EA	240	Angle E = $128^0\ 36^1$

The bearing of AB was $24^0\ 30^1$. Determine the closing error, adjust it, and give the corrected consecutive coordinates.

(OR)

6	a)	Explain the procedure to measure a horizontal angle by repetition method using a theodolite.	CO1	6 Marks
	b)	Explain the temporary adjustments of Vernier transit theodolite with three screw head.	CO6	8 Marks

UNIT-IV

7		Explain the procedure to set out simple circular curve by Rankines method.	CO1	14 Marks

(OR)

8	a)	What are the elements of a simple circular curves?	CO1	6 Marks
	b)	Two straights of a road intersect at a chainage of 2550.5m having an angle of intersection of 110°. Find the various elements of a simple circular curve of 4° to be introduced between the straights.	CO3	8 Marks

UNIT-V

9	a)	What is Total Station? Illustrate its uses.	CO5	6 Marks
	b)	Explain working principles of EDM by phase difference method.	CO1	8 Marks

(OR)

10	a)	Write short notes on electronic theodolite.	CO5	6 Marks
	b)	Describe briefly the advantages of electronic theodolite.	CO1	8 Marks

CODE No.: 16BT30201 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

DC MACHINES
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Illustrate various methods of excitation of DC machines with neat circuit diagrams and deduce the relationships between generated **emf** and terminal voltage.	CO1	7 Marks
	b)	A short compound wound DC generator supplies a load current of 150 A at 230 V. Calculate the **emf** generated, if the resistance of armature, series field and shunt field windings are 0.15Ω, 0.1Ω and 100Ω respectively. Assume the brush drop 1 Volt per brush.	CO4	7 Marks

(OR)

2	a)	Differentiate separately and self-excited DC generators.	CO1	3 Marks
	b)	Derive the condition for maximum efficiency of DC generator.	CO2	4 Marks
	c)	A short-shunt DC compound generator supplies 200A at 100V. The resistance of armature, series filed and shunt field windings are 0.04, 0.03 and 60Ω respectively. Find the **emf** generated. Also find the **emf** generated if same machine is connected as a long-shunt machine.	CO4	7 Marks

UNIT-II

3	a)	Derive the expressions for demagnetizing and cross-magnetizing ampere turns per pole in a DC machine with neat sketch.	CO2	8 Marks
	b)	A 6-pole, 148 A DC shunt generator has 480 conductors and is wave-wound. Its field current is 2A. Find the demagnetizing and cross-magnetizing ampere turns per pole at full load if (i) brushes are on GNA and (ii) brushes are shifted from GNA by 50 electrical degrees.	CO4	6 Marks

(OR)

4	a)	Discuss in detail the detrimental effects of armature reaction in DC machines.	CO1	7 Marks
	b)	With relevant illustrations explain the role of compensating winding in a DC machine.	CO1	7 Marks

UNIT-III

5 The magnetization curve of a DC shunt generator at 1500 r.p.m is as follows. CO1 14 Marks

I_f (A)	0	0.4	0.8	1.2	1.6	2.0	2.4	2.8	3.0
E_g (V)	6	60	120	172.5	202.5	221	231	237	240

For this generator, determine:

i) No-load **emf** for a total shunt field resistance of 100 Ω
ii) The critical field resistance at 1500 r.p.m and
iii) The magnetization curve at 1200 r.p.m and there from the open-circuit voltage for a field resistance of 100 Ω.

(OR)

6	a)	Parallel operation of DC series generators is not stable. Justify.	CO1	6 Marks
	b)	A DC series generator having an external characteristics which is a straight line through zero to 50 V at 200 A connected as a booster between station bus bar and a feeder of 0.3 Ω resistance. Calculate the voltage difference between the station bus bar and the far end of the feeder at a current of (i) 1200 A and (ii) 50 A	CO4	8 Marks

UNIT-IV

7	a)	Drive the expression for torque developed by a DC motor from fundamentals.	CO2	5 Marks
	b)	Select and describe the suitable speed control technique for DC shunt motor which is used to control the speed above rated value.	CO5	4 Marks
	c)	A shunt motor operating on 230 V takes an armature current of 6 A at no-load and runs at 1200 r.p.m. Take Ra = 0.25 Ω. Find the speed and the electromagnetic torque when the armature takes 36 A with the same flux.	CO4	5 Marks

(OR)

8	a)	DC shunt motor is suitable to drive agricultural pump set. Justify.	CO5	6 Marks
	b)	A 220 V shunt motor has an armature resistance of 0.5 Ω. The armature current at starting must not exceed 40 A. Design a 3-point starter with 6 sections and also calculate the values of the resistor steps to be used in this starter.	CO3	8 Marks

UNIT-V

9		A test on two coupled similar tramway motors, with their fields connected in series, gave the following results when one machine acted as a motor and the other as a generator. **Motor :** Armature current = 56 A; Armature voltage = 590 V; Voltage drop across field winding = 40 V **Generator :** Armature current = 44 A; Armature voltage = 400 V; Field voltage drop = 40 V; Resistance of each armature = 0.3 Ω Compute the efficiency of the motor and generator at this load.	CO4	14 Marks

(OR)

10	a)	Mention the advantages and disadvantages of no-load test.	CO1	3 Marks
	b)	Explain running down test for finding stray losses of DC machine.	CO1	5 Marks
	c)	In a retardation test on a separately-excited motor, the induced **emf** in the armature falls from 220 V to 190 V in 30 seconds on disconnecting the armature from the supply. The same fall takes place in 20 seconds if, immediately after disconnection, armature is connected to a resistance which takes 10 A (average) during this fall. Find stray losses of the motor.	CO4	6 Marks

CODE No.: 16BT30202 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

ELECTROMAGNETIC FIELDS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the terms electric field intensity and electric flux density with necessary mathematical relations.	CO1	7 Marks
	b)	Find the total charge in a volume defined by six planes for which $1 \le x \le 2$, $2 \le y \le 3$ and $3 \le z \le 4$, if $\overline{D} = 4x\overline{a}_x + 3y^2\overline{a}_y + 2z^3\overline{a}_z \ C/m^3$.	CO3	7 Marks

(OR)

2	a)	Define potential gradient and obtain a relation between electric field intensity and potential.	CO1	7 Marks
	b)	Find the electric field intensity at the point (1, –2, 1) m given the potential $V = 3x^2y + 2yz^2 + 2xyz$.	CO3	7 Marks

UNIT-II

3	a)	Derive the expression for energy stored in a capacitor.	CO2	7 Marks
	b)	A capacitor consists of square shape metal plates of each 80cm side placed parallel and 3mm apart. The space between the plates is filled with a dielectric having a relative permittivity of 3. A potential difference of 300V is maintained between the plates. Calculate i) The capacitance. ii) Charge on the capacitor. iii) The electric flux density. iv) Energy stored in the capacitor.	CO3	7 Marks

(OR)

4	a)	Derive the expression for the relaxation time and show that the relaxation time is short for good conductors.	CO2	7 Marks
	b)	An electric dipole located at the origin in free space has a moment $\overline{p} = (4\overline{a}_x + 3\overline{a}_y + 3\overline{a}_z)nCm$. Determine i) Potential, V at point $Q(1, 2, 3)$. ii) Electric field intensity at $Q(4, 20^0, 0^0)$.	CO3	7 Marks

UNIT-III

5	a)	Define magnetic field intensity and magnetic flux density. Obtain the relation between them.	CO1	7 Marks
	b)	Derive the expression for magnetic field intensity. i) At the centre. ii) On the axis of circular conductor carrying 'I' amperes of current.	CO2	7 Marks

(OR)

6	a)	Explain how laws of electromagnetics can be applied in MRI machine.	CO5	7 Marks
	b)	A Toroid has 'N' turns and carries current of 'I' amperes. Determine magnetic field strength inside and outside the toroid.	CO5	7 Marks

UNIT-IV

7	a)	Define the terms dipole moment and magnetization and establish a relation between them.	CO1	7 Marks
	b)	Describe about the boundary conditions pertaining to the magnetic materials.	CO1	7 Marks

(OR)

8	a)	Derive the expression for force due to: i) A charged particle in magnetic field. ii) Differential current element.	CO2	7 Marks
	b)	If a point charge of 3 coulombs moves with a velocity of $\vec{u} = 7\overrightarrow{a_x} + 4\overrightarrow{a_y} - 6\overrightarrow{a_z}$ *m/s*, find the force exerted on the charge. i) If the electric field intensity is $\vec{E} = 12\overrightarrow{a_x} + 4\overrightarrow{a_y} - 6\overrightarrow{a_z}$ *V/m*. ii) If the flux density is $\vec{B} = 6\overrightarrow{a_x} + 5\overrightarrow{a_y} + 6\overrightarrow{a_z} wb/m^2$.	CO3	7 Marks

UNIT-V

9	a)	Write the Maxwell's equations in both point form and integral forms for free space and good conductor.	CO1	7 Marks
	b)	A parallel plate capacitor with plate area of $5cm^2$ and plate separation of 3mm has a voltage $50\sin 10^3 t$ Volts applied to its plate. Calculate displacement current density. Assume $\boldsymbol{\varepsilon = 2\varepsilon_0}$.	CO3	7 Marks
		(OR)		
10	a)	Given $\vec{B} = (0.5\overrightarrow{a_x} + 0.6\overrightarrow{a_y} - 0.3\overrightarrow{a_z})\cos(500t)$ Tesla and a filamentary loop with its corners at (2, 3, 0)*m*, (2, -3, 0)*m*, (-2, -3, 0)*m* and (-2, 3, 0)*m*. Find the emf developed in the loop.	CO3	7 Marks
	b)	Find the displacement current density within a parallel plate Capacitor where $\boldsymbol{\varepsilon = 100\varepsilon_0}$, $\boldsymbol{a = 0.01m^2}$, $\boldsymbol{d = 0.05mm}$ and the capacitor Voltage is $100\sin 200\pi t$ volts.	CO3	7 Marks

❀ ❀ ❀

CODE No.: 16BT30203 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

SIGNALS, SYSTEMS AND NETWORKS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

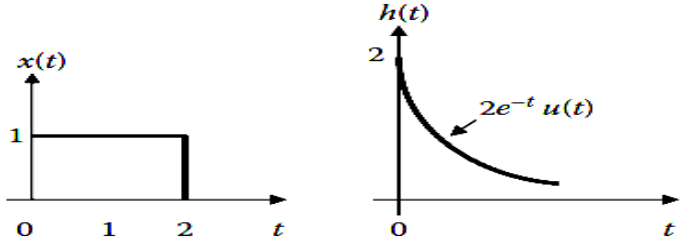
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain power and energy signal and enumerate the necessary conditions for the signal to be a power or energy signal.	CO1	7 Marks
	b)	Determine the total response of the system described by: $\frac{d^2y(t)}{dt^2} + \frac{dy(t)}{dt} + 0.21y(t) = \frac{dx(t)}{dt} + x(t); where x(t) = 0.2e^{-0.5t}u(t)$ With the initial conditions $y'(0) = -1; y(0) = 0.3$.	CO4	7 Marks

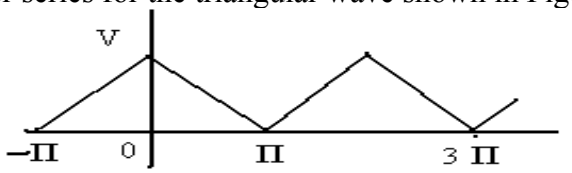
(OR)

2	a)	Define convolution of two continuous time signals.	CO1	6 Marks
	b)	Find the convolution of the two signals $x(t)$ and $h(t)$ in Figure.	CO4	8 Marks



UNIT-II

3	a)	Find the response of a system described by $\frac{dy(t)}{dt} + 2y(t) = x(t);$ using the Fourier transform. Where the input is defined as $x(t) = e^{-t}u(t)$.	CO5	7 Marks
	b)	Find the Fourier series for the triangular wave shown in Figure.	CO4	7 Marks

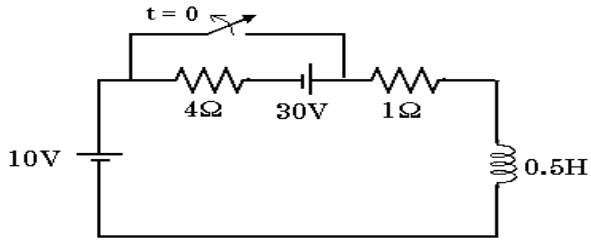


(OR)

4	a)	Find the Laplace transform of the following signals: $f(t) = (2t + 4)\,u(t)$ and $f(t) = (4 + 3e^{-2t})\,u(t)$.	CO5	7 Marks
	b)	A circuit has a transfer function $H(s) = \frac{s+4}{(s+1)(s+2)^2}$, determine the impulse response.	CO4	7 Marks

UNIT-III

5	a)	Explain the transient properties of a capacitor for DC and AC excitations.	CO1	6 Marks
	b)	In the circuit shown below, the switch is initially in closed position for a long time and opened at time t = 0. Find the current i(t)for t>0.	CO4	8 Marks

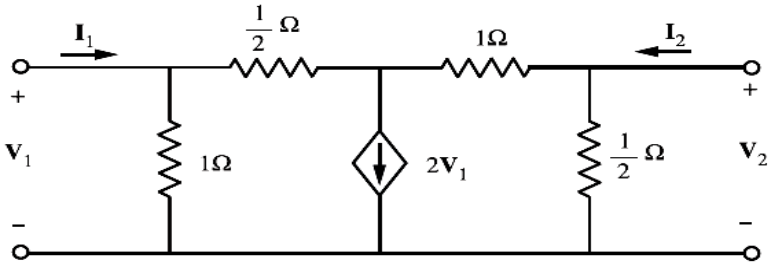


(OR)

6	a)	A DC voltage of 20V is applied at t=0 in a R-L circuit where R=5Ohmsand L=10H. Find the Time constant and the maximum value of stored energy during the transient.	CO4	7 Marks
	b)	A series RL circuit with R = 100 Ω and L = 10 mH has a Sinusoidal excitation V (t) = *250Sin500t.* Find the total current using differential equation method assuming that the capacitor is initially uncharged.	CO4	7 Marks

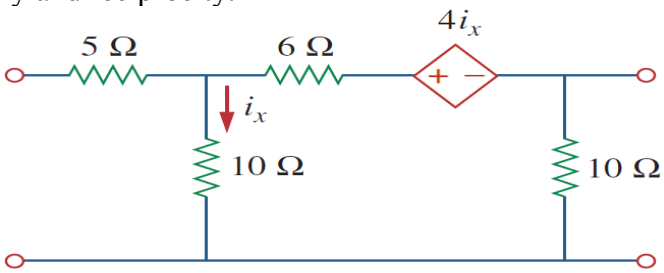
UNIT-IV

7	a)	Express hybrid parameters in terms of admittance parameters for a generalized network.	CO1	7 Marks
	b)	Find the y parameters for the two-port network shown in Figure. Invistigate the netwok for symmetry and reciprocity.	CO4	7 Marks



(OR)

8	a)	State the necessary conditions for a network function to be a driving point function.	CO1	6 Marks
	b)	Find the hybridparameters of the network in Figure. Invistigate the netwok for symmetry and reciprocity.	CO4	8 Marks



UNIT-V

9	a)	Analyze the nature of characteristic impedance in pass band and stop bands with relevant equations.	CO2	6 Marks
	b)	In a signal processing application, it is required to allow only the frequencies ranging between 12 kHz to 16 kHz which is connected to an load impedance of 600 Ω. Justify a suitable proto type filter circuit with proper components and their specifications.	CO6	8 Marks

(OR)

10	a)	Derive the design equations for a High pass T-section filter.	CO2	6 Marks
	b)	Design a constant *k* filter to eliminate band of frequencies lying between 2000Hz and 6000Hz with a design impedance of 600 Ω. Also determine attenuation and phase shift 1 kHz and 4 kHz.	CO3	8 Marks

CODE No.: 16BT30241 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

ELECTRICAL TECHNOLOGY

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Describe the constructional details of DC machine.	CO1	10 Marks
	b)	A 4-pole wave connected DC generator having 60 slots on its armature with 6 conductors per slot, run at 750 r.p.m and generates an open circuit voltage of 230V. Find the useful flux per pole.	CO4	4 Marks
		(OR)		
2	a)	Derive the e.m.f equation of DC generator.	CO2	7 Marks
	b)	Explain the principle of operation of a DC generator.	CO1	7 Marks

UNIT-II

3	a)	List the applications of transformer.	CO6	4 Marks
	b)	Why Transformer is rated in kVA?	CO1	3 Marks
	c)	The primary and secondary windings of a 50 kVA, 6600/220V transformer have resistance of 7.8Ω and 0.0085Ω respectively. The transformer draws no-load current of 0.328A at p.f. of 0.3 lagging. Calculate the efficiency at full load, if the load operates at a p.f. of 0.8 lagging.	CO4	7 Marks
		(OR)		
4	a)	Identify a suitable test to obtain copper losses in a single phase transformer and explain the procedure and calculations in detail with a neat sketch.	CO5	7 Marks
	b)	A 40 kVA transformer has iron loss of 450 W and full load copper loss of 850 W. If the power factor of load is 0.8 lagging, calculate: i) Efficiency at full load. ii) The load at which maximum efficiency occurs. iii) The maximum efficiency.	CO4	7 Marks

UNIT-III

5	a)	Derive expressions of phase and line quantities in delta connected network.	CO2	7 Marks
	b)	A balanced star connected load is supplied from symmetrical three phase, 400V system. The current in phase is 30 A and lags behind phase voltage by 30^0. Find: i) The impedance in each phase. ii) The total power.	CO4	7 Marks
		(OR)		
6	a)	Prove that two wattmeters are enough to measure the total power of a three phase unbalanced system with a neat phasor diagram.	CO2	7 Marks
	b)	Three equal impedances each having a resistance and reactance of 25Ω and 40Ω respectively connected in delta to 400V, three phase, 50Hz supply system. Calculate: i) The line current. ii) Power factor. iii) Power consumed by the circuit.	CO4	7 Marks

UNIT-IV

7	a)	Explain the constructional features of an alternator.	CO1	7 Marks
	b)	A 12-pole, 3 phase alternator is coupled to an engine running at 500 r.p.m. The generator supplies an induction motor having a full load speed of 1440 r.p.m. Find the percentage slip and number of poles of this induction motor.	CO4	7 Marks

(OR)

8	a)	Discuss the constructional features of salient pole type alternator.	CO1	3 Marks
	b)	List out the applications of three phase induction motors.	CO6	4 Marks
	c)	An alternator on open-circuit generates 360V at 60Hz when the field current is 3.6A. Neglecting saturation, determine the open-circuit e.m.f when the frequency is 40Hz and the field current is 2.4 A.	CO4	7 Marks

UNIT-V

9	a)	Discuss about the double field revolving theory in single phase induction motor.	CO1	7 Marks
	b)	Why the starting torque of a capacitor start induction motor is better than that of a resistance start motor? Explain.	CO2	7 Marks

(OR)

10	a)	Explain the constructional details of permanent magnet stepper motor.	CO1	7 Marks
	b)	Explain the working of variable reluctance stepper motor and mention its applications.	CO1	7 Marks

CODE No.: 16BT30302 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

KINEMATICS OF MACHINERY
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Explain Grashof's criterion and describe any two inversions of 4 bar chain with suitable sketches.	CO1	14 Marks

(OR)

2	a)	Classify and explain the types of Kinematic pairs	CO1	10 Marks
	b)	What is Grubler's criterion?	CO1	4 Marks

UNIT-II

3		In a slider crank mechanism, the crank OB is 30mm and the connecting rod BC is 120mm long. The crank rotates at 300 r.p.m clockwise and makes 60^0 from IDC. Find i) The velocity of piston C. ii) Angular velocity of connecting rod BC.	CO2	14 Marks

(OR)

4		In a four bar mechanism PQRS, PS is fixed link of length 120mm. Crank PQ is 45mm rotates at 200 r.p.m and an acceleration of 150 rad/sec^2 at an instant when crank makes an angle 45^0 to the horizontal. Both are clockwise in nature. The link QR is 90mm and link RS is 60mm. Find the acceleration of Q and R.	CO2	14 Marks

UNIT-III

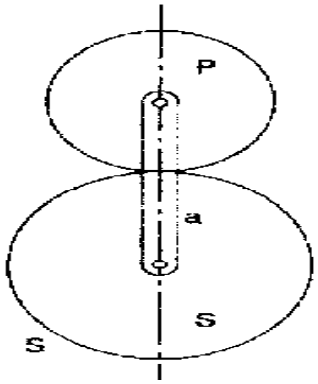
5		Sketch and explain any one type of exact straight line motion mechanism.	CO1	14 Marks

(OR)

6		Derive the condition for correct steering mechanism. Sketch and show the two main steering gears and discuss their relative advantages.	CO1	14 Marks

UNIT-IV

7		An epi-cyclic gear train consists of an arm 'a' and two gears P and S having 30 teeth and 50 teeth respectively. The arm rotates about the centre of the gear S at a speed of 120 r.p.m clock wise. Determine the speed of gear P for the following conditions: i) If gear S is fixed. ii) The gear S rotates at 180 r.p.m counter clockwise instead of being fixed.	CO4	14 Marks



(OR)

8	a)	Find an expression for the length of the path of contact between two mating spur gears.	CO3	6 Marks
	b)	Two mating involute spur gears have 28 and 45 teeth and a standard addendum of one module. Find the length of path of contact and length of arc of contact in terms of module when pressure angle is 20^0.	CO3	8 Marks

UNIT-V

9		A cam with 40 mm minimum radius is rotating clockwise at uniform speed of 1200 r.p.m. It has to operate a knife edge follower as defined below: i) Follower has to move outward through 30mm during 90^0 . of cam rotation with uniform velocity. ii) Dwell for the next 30^0. iii) Follower is to return to its starting position with SHM during next 120^0. iv) Follower is to dwell for remaining period. Draw the cam profile taking the line of action of the follower passing through the center of the cam. Determine the maximum velocity and acceleration of the follower during the return stroke.	CO5	14 Marks

(OR)

10		From the following data draw the cam profile in which the following moves with SHM during ascent and uniformly accelerated and decelerated motion during descent. The diameter of the roller follower is 30mm and lift is 40mm. Angle of ascent = 48^0, angle of descent= 60^0, angle of dwell between ascent and descent = 42^0, The least radius of the cam is 50mm and the distance between line of action of the follower and axis of cam = 20mm. If the cam rotates at 360 r.p.m CCW, find the maximum velocity and acceleration of the follower during ascent and descent.	CO6	14 Marks

CODE No.: 16BT30303 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

MANUFACTURING TECHNOLOGY
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Write types of pattern allowances and sketch any two of them.	CO1	7 Marks
	b)	Explain the design considerations are needed to be followed in Gating system.	CO3	7 Marks
		(OR)		
2	a)	What are the specific advantages of match plate patterns? Explain how they are used for making mould.	CO5	7 Marks
	b)	Give various tests available for testing Moulding sand and explain permeability testing procedure with neat sketch.	CO2	7 Marks
		UNIT-II		
3	a)	What are the functions of gating and risering?	CO3	7 Marks
	b)	Describe the shell moulding process.	CO4	7 Marks
		(OR)		
4	a)	List out various casting defects and explain any one with neat sketch.	CO2	7 Marks
	b)	Write short notes on cleaning and finishing of castings.	CO5	7 Marks
		UNIT-III		
5	a)	Describe the principle of rolling. Write the various kinds of rolling mills along with their applications.	CO5	7 Marks
	b)	What is deep drawing operation? Explain with a neat sketch.	CO1	7 Marks
		(OR)		
6	a)	Briefly explain compound dies used in sheet metal operations.	CO4	7 Marks
	b)	With a neat sketch, explain the explosive forming.	CO5	7 Marks
		UNIT-IV		
7	a)	Sketch and explain the construction and working of resistance spot welding with its advantages and limitations.	CO5	7 Marks
	b)	List the non-destructive tests applied in welding and its advantages.	CO5	7 Marks
		(OR)		
8	a)	List out the welding defects and explain any two of it.	CO2	7 Marks
	b)	Discuss about Brazing with neat sketch.	CO4	7 Marks
		UNIT-V		
9	a)	Describe the working principle of blow molding process.	CO1	7 Marks
	b)	Describe different types of plastics with applications of each type.	CO1	7 Marks
		(OR)		
10	a)	Explain the principle of injection moulding process.	CO4	7 Marks
	b)	What are the additives to be mixed in processing plastics and explain the purpose of each?	CO5	7 Marks

❀ ❀ ❀

CODE No.: 16BT30304 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

STRENGTH OF MATERIALS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Write a short note on strain energy.	CO1	5 Marks
	b)	A rectangular block 350mm long, 100mm wide and 80mm thick is subjected to axial load as follows. 50kN tensile in the direction of length, 100kN compression in the direction of thickness and 60kN tensile in the direction of breadth. Determine the change in volume, Bulk modulus, modulus of rigidity. Take E=2 x 10^5 N/mm^2 and Poisson's ratio 0.25.	CO2	9 Marks

(OR)

2	a)	Draw the stress strain curve for brittle materials and explain the salient points on it.	CO6	6 Marks
	b)	Derive a relation for change in length of a uniformly varying circular bar subjected to an axial load 'P'.	CO1	8 Marks

UNIT-II

3		Draw the shear force and bending moment diagram for the overhanging beam carrying uniformly distributed load of 2kN/m over the entire length and a point load of 2kN as shown in Fig 1. Locate the point of contraflexure, if any.	CO6	14 Marks

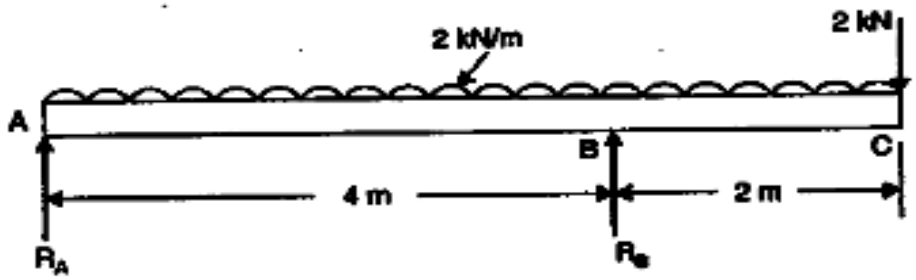


Fig.1

(OR)

4	a)	Draw the shear force and bending moment diagram for a cantilever beam of length 'L' carrying a uniformly distributed load of W kN/m over the entire span representing maximum values.	CO2	6 Marks
	b)	Draw the shear force and bending moment diagram for a cantilever simply supported beam loaded as shown in fig 2.	CO6	8 Marks

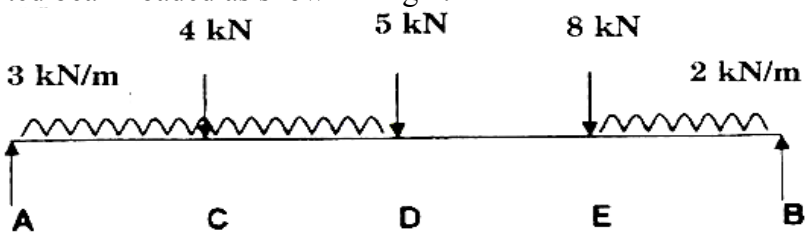


Fig.2

UNIT-III

5		The internal and external diameter of a hollow shaft is in the ration of 2:3. The hollow shaft is to transmit a 400 kW power at 120 r.p.m. The maximum expected toque is 15% greater than the mean value. If the shear stress is not to exceed 50 MPa, Fins section of the shaft which would satisfy the shear stress and twist conditions. Take G = 0.85 x 10^5 MPa.	CO3	14 Marks

(OR)

6	a)	Define 'simple bending' or 'pure bending'. List the assumptions made in the theory of simple bending.	CO1	4 Marks
	b)	A cast iron beam is of T-section of flange 100mm x 20mm and web 20mm x 80mm. The beam is simply supported on a span of 8m. The beam carries a uniformly distributed load of 1.5kN/m length over the entire span. Determine the maximum tensile and maximum compressive stresses.	CO3	10 Marks

UNIT-IV

7		A beam of length 6m is simply supported at its ends and carries two point loads of 48kN at a distance of 1m and 3m respectively from left end support. Find the deflection under each load, the maximum deflection and the point at which it occurs. Take E=2 x 10^5 MPa and I=85 x 10^6 mm^4.	CO5	14 Marks

(OR)

8		A beam of uniform rectangular section 200mm wide and 300mm deep is simply supported at its ends. It carries a uniformly distributed load of 9kN/m run over the entire span of 5m. If the value of E for the beam material is 1 x 10^4 N/mm^2, find: i) The slope at the supports. ii) Maximum deflection.	CO5	14 Marks

UNIT-V

9		A cylindrical shell 1m diameter and 3m length is subjected to an internal pressure of 2MPa. Calculate the maximum thickness if the stress should not exceed 50MPa. Find the change in diameter and volume of shell. Assume Poisson's ratio of 0.3 and Young's modulus of 200kN/mm^2.	CO3	14 Marks

(OR)

10	a)	Show that in thin cylindrical shells subjected to internal fluid pressure, the circumferential stress is twice the longitudinal stress.	CO2	4 Marks
	b)	Determine the maximum and minimum hoop stress across the section of a pipe of 400mm internal diameter and 100mm thick, when the pipe contains a fluid at a pressure of 8 N/mm^2.	CO4	10 Marks

CODE No.: 16BT30305 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

THERMODYNAMICS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What is meant by point and path function? Explain with one example each.	CO1	6 Marks
	b)	Define the following: i) Equilibrium and its types. ii) Define property, state, path and process of a system. iii) State Zeroth law of Thermodynamics. iv) Various thermodynamic processes.	CO1	8 Marks
		(OR)		
2	a)	What is meant by quasi static process and explain it with the neat sketch.	CO1	6 Marks
	b)	A fluid is confined in a cylinder by a spring loaded frictionless piston so that the pressure in the fluids is a linear function of the volume (p=a+bV). The internal energy of the fluid is given by the following equation U=34+3.15pV where U is in kJ, p is in kPa and V in cubic meter. If the fluid changes from an initial state of 170kPa, 0.03cubic meter to a final state of 400kPa , 0.06cubic meter, with no work other than that done on the piston, find the direction and magnitude of the work and heat transfer.	CO2	8 Marks

UNIT-II

3		Derive the steady flow energy equation with all the assumptions made and give the equations when it is applied to i) Boiler, ii) Condenser ii) Nozzle, iv)Turbine, v)Compressor	CO1	14 Marks
		(OR)		
4	a)	State the First Law of Thermodynamics and prove that for a non-flow process, it leads to the energy equation $Q = \Delta U + W$.	CO1	4 Marks
	b)	A reversible heat engine operating between reservoirs at 900K and 300K drives a reversible refrigerator operating between reservoirs at 300K and 250K. The heat engine receives 1800kJ heat from 900K reservoir. The net output from the combined engine refrigerator is 360kJ. Find the heat transferred to the refrigerator and the net heat rejected to the reservoir at 300K.	CO2	10 Marks

UNIT-III

5	a)	Discuss the concept of entropy and importance of T-s diagram.	CO3	4 Marks
	b)	An insulated 0.75 kg copper calorimeter can containing 0.2 kg water is in equilibrium at a temperature of 20°C. An experimenter now places 0.05 kg of ice at 0°C in the calorimeter and encloses the latter with a heat insulating shield. i) When all the ice has melted and equilibrium has been reached, what will be the temperature of water and the can? The specific heat of copper is 0.418 kJ/kg K and the latent heat of fusion of ice is 333 kJ/kg. ii) Compute the entropy increase of the universe resulting from the process. iii) What will be the minimum work needed by a stirrer to bring back the temperature of water to 20°C?	CO3	10 Marks

(OR)

6	a)	Derive expressions for entropy changes for a closed system in the following cases : i) Heating a gas at constant volume. ii) Heating a gas at constant pressure.	CO3	4 Marks
	b)	Air at 20°C and 1.05 bar occupies 0.025m³. The air is heated at constant volume until the pressure is 4.5 bar, and then cooled at constant pressure back to original temperature. Calculate : i) The net heat flow from the air. ii) The net entropy change. Sketch the process on T-s diagram	CO3	10 Marks

UNIT-IV

7	a)	Draw the phase change process for pure substance or steam formation and explain	CO1	4 Marks
	b)	A closed vessel of 0.2 cubic meter contains steam at 1 Mpa and temperature of 250 deg C. If the vessel is cooled so that pressure falls to 350kPa. Determine the final temperature, heat transfer and change in entropy during the process.	CO4	10 Marks

(OR)

8	a)	Write the following: i) Mole fraction and Mass fraction. ii) Gravimetric Analysis and Volumetric Analysis.	CO3	6 Marks
	b)	A vessel having a volume of 0.6 m³ contains 3.0 kg of liquid water and water vapour mixture in equilibrium at a pressure of 0.5 MPa. Calculate : i) Mass and volume of liquid. ii) Mass and volume of vapour.	CO4	8 Marks

UNIT-V

9	a)	Derive the expression to find the efficiency of air standard dual cycle with the help of p-v and t-s diagram.	CO4	4 Marks
	b)	An I.C. engine operating on the dual cycle (limited pressure cycle) the temperature of the working fluid (air) at the beginning of compression is 27°C. The ratio of the maximum and minimum pressures of the cycle is 70 and compression ratio is 15. The amounts of heat added at constant volume and at constant pressure are equal. Compute the air standard thermal efficiency of the cycle. State three main reasons why the actual thermal efficiency is different from the theoretical value. Take γ for air = 1.4.	CO5	10 Marks

(OR)

10	a)	Write the assumption in air standard cycles.	CO1	4 Marks
	b)	An engine with 200mm cylinder diameter and 300mm stroke works on theoretical Diesel cycle. The initial pressure and temperature of air used are 1 bar and 27°C. The cut-off is 8% of the stroke. Determine : i) Pressures and temperatures at all salient points. ii) Theoretical air standard efficiency. iii) Mean effective pressure. iv) Power of the engine if the working cycles per minute are 380. Assume that compression ratio is 15 and working fluid is air. Consider all conditions to be ideal.	CO5	10 Marks

CODE No.: 16BT30401 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

ELECTRONIC CIRCUIT ANALYSIS AND DESIGN
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	List types of coupling schemes used in multistage amplifiers.	CO2	7 Marks
	b)	Apply cascading technique to construct a Direct coupled amplifier.	CO6	7 Marks
		(OR)		
2	a)	List the classification of BJT amplifiers.	CO2	7 Marks
	b)	Apply cascading concept to get large voltage gain and explain with block diagram.	CO6	7 Marks

UNIT-II

3	a)	Discuss Low and High frequency analysis of an Amplifier.	CO3	7 Marks
	b)	Apply Short circuit concept in a CE amplifier to derive Current gain equation.	CO6	7 Marks
		(OR)		
4	a)	Derive the expressions for hybrid Π conductances g_{ce}, $g_{bb'}$ and g_m of a transistor.	CO3	7 Marks
	b)	For a given CE amplifier with β=100, I_c=5mA, V_{ce}=10V, h_{ie}=800, h_{oe}=10^{-4} , r_e= 10^{-4}. Take f_T=50MHz and C_{ob}=3pF. Compute g_m and $g_{b'e}$.	CO4	7 Marks

UNIT-III

5	a)	Draw the RC phase shift oscillator circuit with BJT and explain its operation.	CO1	7 Marks
	b)	Select a Trans-conductance amplifier and prove its input and output impedances are very large compared to CE amplifier.	CO5	7 Marks
		(OR)		
6	a)	Select a Trans-Resistance amplifier and prove its input and output impedances are very large compared to CE amplifier.	CO5	7 Marks
	b)	Draw the Hartley oscillator with BJT, explain its operation and derive an expression for frequency of oscillations.	CO1	7 Marks

UNIT-IV

7	a)	Prove Class B power amplifier efficiency is 78.5%.	CO3	8 Marks
	b)	Write short notes on distortion occur in power amplifiers	CO1	6 Marks
		(OR)		
8	a)	A push pull amplifier utilizes a transformer whose primary has a total of 160 turns and whose secondary has 40 turns. It must be capable of delivering 40W to an 8 Ω load under maximum power conditions. What is the minimum possible value of V_{cc}?	CO4	7 Marks
	b)	Explain Class A series fed power amplifier with neat circuit diagram.	CO1	7 Marks

UNIT-V

9	a)	Design a single tuned amplifier for the following specifications. Centre frequency of 500 KHz and a Band width of 10KHz. Assume the transistor parameters g_m = 0.04S, h_{fe} = 100, $c_{b'e}$ = 1000pF, $C_{b'c}$ = 100pF. The bias network and input resistance are adjusted such that R_i = 4KΩ and R_L= 510Ω.	CO3	7 Marks
	b)	A class C amplifier has a base bias voltage of -5V and V_{cc} = 30 V. It is determined that a peak input voltage of 9.8V at 1MHz is required to derive the transistor to its saturation current of 1.8 A.	CO4	7 Marks
		(OR)		
10	a)	Write short notes on stability of Tuned Amplifiers.	CO1	7 Marks
	b)	Derive the expressions for Bandwidth and Q-factor of single tuned, capacitive coupled amplifiers. List the assumptions made for the derivation.	CO4	7 Marks

❁ ❁ ❁

CODE No.: 16BT30402 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

SIGNALS AND SYSTEMS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Bring out the relation between: i) Signum and step function. ii) Sinusoidal and exponential functions based on their properties.	CO2	7 Marks
	b)	Given a signal $x(t)$ $= t \quad 0 < t < 2$ $= 2 \quad t > 2\ t > 2$ $= 0 \quad$ elsewhere Plot the following signals x(2t), x(-t), x(t/2), 7x(-2t+3)	CO4	7 Marks

(OR)

2	a)	List out the properties of an LTI system.	CO2	6 Marks
	b)	What is the importance of convolution? Find the response of a system for the given sequences x(n)={1,0,-1,2,1} and h(n)={1,2,-1,2}.	CO4	8 Marks

UNIT-II

3	a)	What is the relationship between cosine and trigonometric representation of Fourier series?	CO1	6 Marks
	b)	Determine exponential Fourier series representation for the output of full wave rectifier with T=1sec.	CO3	8 Marks

(OR)

4	a)	What are the difference between Fourier series and Fourier transform?	CO1	4 Marks
	b)	Find the Fourier transform of the following. i) $x(t) = A \sin (2\pi fct) U(t)$. ii) $x(t) = A \text{ rect}(t / T) \cos (2\pi fct)$.	CO2	10 Marks

UNIT-III

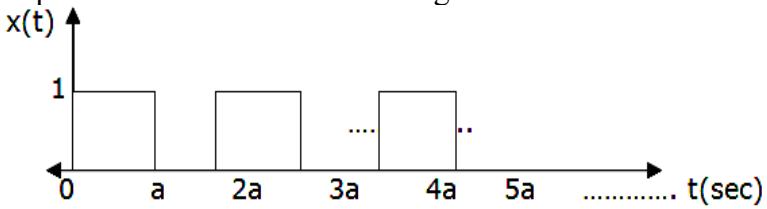
5	a)	A filter has an input $x(t)=e^{-2t}u(t)$ and transfer function, $H(W)=1/(1+jw)$. Find ESD of the output.	CO3	8 Marks
	b)	Discuss about the properties of convolution.	CO1	6 Marks

(OR)

6	a)	Examine how convolution and correlation of a signal are related in the context of signal processing.	CO3	7 Marks
	b)	State and prove Parseval's theorem.	CO1	7 Marks

UNIT-IV

7	a)	find the Laplace transform of the following waveform	CO4	9 Marks



	b)	State and prove the time shifting and time integration property of Laplace transform	CO1	5 Marks

(OR)

8	a)	Obtain the Laplace Transform of a gate function and define ROC and with their conditions.	CO4	8 Marks
	b)	State and explain ROC Property of Laplace Transform if x(t) is two sided signal.	CO1	6 Marks

UNIT-V

9	a)	For the anlog signal x(t)= 3cos100πt which is to be transmitted into free space i) Determine minimum sampling rate to avoid alaising. ii) Suppose that the signal is sampled at a rate fs=200Hz, what is the discrete time signal obtained after sampling ? iii) Suppose the signal is sampled at a rate fs=75hz,what is the discrete time signal obtained after smapling ? iv) What is the frequency **0<f<fs/2** of a sinusoid that yeilds samples identical to those obtained in (iii) above compare them with the standard transmission values in frequency band?	CO5	10 Marks
	b)	Examine the conditions on pole location for stability.	CO2	4 Marks

(OR)

10	a)	The final value of a system whose input $\mathbf{x(t)=(2+e^{-3t})u(t)}$ is obviously x(α)=2. Show that the final value can be found with final value theorem	CO5	8 Marks
	b)	Obtain the relationship among the Fourier Transform, Laplace Transform and Z-Transform.	CO2	6 Marks

CODE No.: 16BT30403 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

SWITCHING THEORY AND LOGIC DESIGN

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Determine the error bit location for the received information $(0100011)_2$using odd parity.	CO6	6 Marks
	b)	Express the Gray code equivalent for the binary numbers. i) $(110010101)_2$ (ii) $(101111001)_2$ iii) $(111010111)_2$ (iv) $(111111011)_2$.	CO4	8 Marks

(OR)

2	a)	Determine the error bit location for the received information $(0100011)_2$ using even parity.	CO6	6 Marks
	b)	Simplify the following Boolean function to minimum number of literals and convert them from Standard SOP to Standard POS and SPOS to SSOP respectively (i) F(A, B, C)= Σ (0, 2, 4, 6, 7, 9, 10, 12, 14), (ii) F(A, B, C) = π (1, 3, 4, 5, 7, 8, 10, 11, 15)	CO4	8 Marks

UNIT-II

3	a)	Simplify the Boolean function using K-map in SOP forms. F=∑m(0, 1, 2, 4, 7, 8, 12, 14, 15, 16, 17, 18, 20, 24, 28, 30, 31).	CO2	7 Marks
	b)	Minimize the criterion the following using K-map. F(A, B, C, D).= Σm (0, 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 13).	CO3	7 Marks

(OR)

4	a)	Minimize the following expression using tabular method. Y(w,x,y,z)=∑m(1,2,3,5,9,12,14,15)+ ∑d(4,8,11)	CO3	7 Marks
	b)	Simplify the following Boolean function using tabulation method. F(A,B,C,D)=Σm(3,4,5,7,8,9,12,13,14)	CO2	7 Marks

UNIT-III

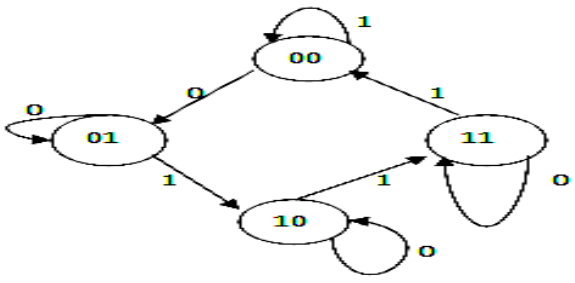
5	a)	Prepare 5-to-32 decoder using one 2-to-4 and four 3-to-8 decoders.	CO3	8 Marks
	b)	Mention its application along with the serial Transfer in 4-bit shift registers.	CO1	6 Marks

(OR)

6	a)	Construct a full adder using a suitable multiplexer.	CO3	7 Marks
	b)	Explain 4-line to 16-line decoder using 3-line to 8-line decoders.	CO1	7 Marks

UNIT-IV

7	a)	Describe race-around problem in JK Flip-flop. Explain how it is eliminated in Master slave JK Flip –Flop.	CO4	7 Marks
	b)	Design a Sequential circuit using JK Flip flop from the following state diagram	CO6	7 Marks



(OR)

8	a)	Convert SR Flip-Flop to D Flip-Flop.	CO2	7 Marks
	b)	Design a synchronous counter for 4—6—7—3—1—4 using JK flip-flop.	CO3	7 Marks

UNIT-V

9	a)	Realize the following functions using a 8 x 3 PROM $F_1=\Sigma m(0,4,7)$, $F_2=\Sigma m(1,3,6)$, $F_3=\Sigma m(1,2,4,6)$.	CO5	7 Marks
	b)	Design a combinational using a PROM. The circuit accepts 3-bit binary number and generates its equivalent gray code.	CO3	7 Marks

(OR)

10	a)	Derive the PAL programming table for the combinational circuit that squares a 3 bit number.	CO5	7 Marks
	b)	Explain in detail the different types of ROMS.	CO1	7 Marks

CODE No.: 16BT30441 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

ANALOG ELECTRONIC CIRCUITS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Discuss CE short circuit current gain with relevant equations.	CO3	8 Marks
	b)	Define f_β f_T and f_α and state the relation between f_β and f_T.	CO1	6 Marks

OR)

2	a)	Derive the expressions for hybrid Π conductance g_{ce}, $g_{bb'}$ and gm of a transistor.	CO3	8 Marks
	b)	What is the use of hybrid parameters in small signal analysis?	CO1	6 Marks

UNIT-II

3	a)	What is feedback amplifies? Classify types of feedback amplifiers.	CO1	8 Marks
	b)	Implement Voltage-Shunt feedback concept for a CE amplifier and show $R_{if} = \frac{R_i}{1 + R_i\beta}$.	CO6	6 Marks

(OR)

4	a)	State and explain the Barkhausen's criterion for Oscillations.	CO1	6 Marks
	b)	Implement Audio frequency oscillator by using conventional passive components like R and C and derive its frequency of oscillations.	CO6	8 Marks

UNIT-III

5	a)	What are the advantages and disadvantages of a transformer coupled Class-A power amplifier?	CO1	7 Marks
	b)	Select a power amplifier to get an efficiency of 25%.explain it.	CO5	7 Marks

(OR)

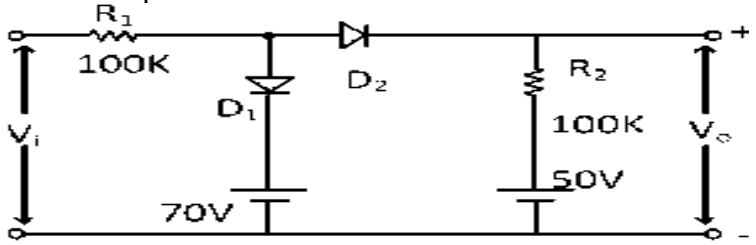
6	a)	Select an appropriate technique to get Minimum distortion in power amplifiers, compromising with efficiency.	CO5	7 Marks
	b)	Explain the operation of a Class-A power amplifier and derive the expression for maximum efficiency.	CO1	7 Marks

UNIT-IV

7	a)	Evaluate upper 3-dB and Lower 3-dB frequencies for 1KHZ Square wave output from an amplifier with Rise time t_r=250ns and tilt=10%.	CO4	7 Marks
	b)	Discuss how positive peak clamper is different from negative peak clamper.	CO1	7 Marks

(OR)

8	a)	The input voltage of the two level clippers is varying linearly from 0 to 100v. Draw the output waveform and transfer characteristics.	CO4	7 Marks



	b)	Briefly explain about clamping circuit theorem and write its necessary condition.	CO1	7 Marks

UNIT-V

9	a)	List the applications of astable multivibrator.	CO2	7 Marks
	b)	Apply appropriate technique to convert voltage to frequency, using two transistors.	CO5	7 Marks

(OR)

10	a)	Apply appropriate technique to convert any signal to square signal, using two transistors and deduct necessary expressions.	CO5	8 Marks
	b)	List the applications of Bi-stable multi-vibrator.	CO2	6 Marks

CODE No.: 16BT30501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

COMPUTER ORGANIZATION

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Draw the flow chart for Booth's Multiplication. Show the steps for (+5) x (–3) using Booth's Multiplication Process.	CO1	7 Marks
	b)	Design a 4-bit binary incrementer circuit using four Half-Adder circuits.	CO3	7 Marks
		(OR)		
2	a)	Perform the following arithmetic operations in binary using 2's complement representation. Consider 8-bits for representing binary numbers. i) 6 + 13. ii) – 6 + 13. iii) 6 – 13. iv) – 6 –13.	CO5	7 Marks
	b)	What is register transfer logic language? Explain few RTL statements for branching with their actual functioning.	CO1	7 Marks

UNIT-II

3	a)	Differentiate Hardwired control with Micro-programmed control.	CO2	4 Marks
	b)	Suppose a machine encodes instructions in 32 bits according to the following format. Also, suppose the encoding must accommodate 164 op-codes, and 50 registers. i) What is the minimum number of bits required to represent the op-code field? ii) What is the minimum number of bits required to represent each of the register fields? iii) What is the greatest number of bits that are left for the immediate field?	CO4	10 Marks
		(OR)		
4	a)	Describe briefly about various addressing modes.	CO1	7 Marks
	b)	What are the phases of an Instruction Cycle? Draw the flow chart for initial configuration of an Instruction Cycle.	CO1	7 Marks

UNIT-III

5	a)	A DMA module is transferring the characters to memory using cycle stealing from a device transmitting at 9600 bps. The processor is fetching instructions at the rate of 1 MIPS. By how much will the processor be slowed down due to DMA activity?	CO4	7 Marks
	b)	Explain about peripheral devices and components in details.	CO1	7 Marks
		(OR)		
6	a)	It is necessary to transfer 256 words from a magnetic disk to a memory section starting from address 1230. The transfer is by means of DMA. i) Give the initial values that the CPU must transfer to the DMA Controller. ii) Give the step-by-step account of the actions taken during the input of the first 2 words.	CO4	7 Marks
	b)	Explain program interrupt and interrupt cycle.	CO1	7 Marks

UNIT-IV

7	a)	Compare and contrast various Read Only Memories (ROM).	CO2	7 Marks
	b)	A computer uses RAM chips of 1024 x 1 capacity.	CO3	7 Marks
		i) How many chips are needed and how should their address lines be connected to provide a memory capacity of 1024 bytes.		
		ii) How many chips are needed to provide a memory capacity of 16K Bytes.		
		iii) Design the logic circuit.		

(OR)

8	a)	Distinguish between synchronous and asynchronous DRAM.	CO2	7 Marks
	b)	Consider a machine with a byte addressable main memory of 2^{16} bytes and block size of 8 bytes. Assume that a direct mapped cache consisting of 32 lines is used with this machine.	CO4, CO5	7 Marks
		i) How is a 16-bit memory address divided into tag, line number, and byte number?		
		ii) Into what line would bytes with each of the following addresses be stored?		
		0001 0001 0001 1011		
		1100 0011 0011 0100		
		1101 0000 0001 1101		
		1010 1010 1010 1010		
		iii) Suppose the byte with address 0001 1010 0001 1010 is stored in the cache. What are the addresses of the other bytes stored along with it?		
		iv) How many total bytes of memory can be stored in the cache?		
		v) Why the tag is also stored in the cache?		

UNIT-V

9	a)	Consider 2 processors P_0 and P_1. Consider memory module with 8 words. Design a Binary Tree Multistage Switching Network to connect processors with memory using 2 x 2 switches.	CO3	7 Marks
	b)	A weather forecasting computation requires 250 billion floating-point operations. The problem is processed in a supercomputer that can perform 100 megaflops. How long will it take to do these calculations?	CO6	7 Marks

(OR)

10	a)	Explain the Serial Inter-processor Arbitration with a neat sketch.	CO1	7 Marks
	b)	It is necessary to design a pipeline for a fixed-point multiplier that multiplies two 8-bit binary integers. Each segment consists of a number of AND gates and a binary adder similar to an array multiplier.	CO4	7 Marks
		i) How many AND gates are there in each segment and what size of adder is needed?		
		ii) How many segments are there in the pipeline?		
		iii) If the propagation delay in each segment is 30ns, what is the average time that it takes to multiply two fixed-point numbers in the pipeline?		

CODE No.: 16BT30502 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

DATA STRUCTURES

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1		Define Single Linked List. How to create a single linked list and display the list in reverse order?	CO1	14 Marks
		(OR)		
2	a)	List the advantages of linked list over arrays.	CO1	7 Marks
	b)	Define Doubly linked list. With a neat diagram, show how an element is added and removed from front end of the list.	CO1	7 Marks
		UNIT-II		
3	a)	Define Stack. Write a procedure to implement stack operations using Linked Lists.	CO1	10 Marks
	b)	List the applications of Stack.	CO1	4 Marks
		(OR)		
4	a)	Define queue. Explain the operations of Queue using linked list with examples.	CO1	9 Marks
	b)	List the applications of Stack.	CO1	5 Marks
		UNIT-III		
5	a)	Give an algorithm for finding maximum element in binary tree.	CO3	7 Marks
	b)	Construct binary tree and identify the post-order from given in-order and preorder traversals. In-order : D B E A F C Pre-order: A B D E C F	CO3	7 Marks
		(OR)		
6		In a binary tree, how do you compute the number of leaf nodes? Explain the algorithm with suitable example.	CO3	14 Marks
		UNIT-IV		
7	a)	Define a graph and write about different types of graphs.	CO1	7 Marks
	b)	Explain in detail different ways of representing graphs.	CO1	7 Marks
		(OR)		
8		Describe in detail about depth first traversal of a graph with suitable example.	CO1	14 Marks
		UNIT-V		
9		Indicate whether you use an Array, Linked List or Hash Table to store data in each of the following cases. Justify your answer. i) A list of employee records need to be stored in a manner that is easy to find max or min in the list. ii) A data set contains many records with duplicate keys. Only thing needed is to keep the list in sorted order. iii) A library needs to maintain books by their ISBN number. Only thing important is finding them as soon as possible. iv) A data set needs to be maintained in order to find the median of the set quickly.	CO6	14 Marks
		(OR)		
10		Compare the following Open addressing methods. i) Linear Probing. ii) Quadratic Probing. iii) Double Hashing.	CO2	14 Marks

❀ ❀ ❀

CODE No.: 16BT30503 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

PYTHON PROGRAMMING

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Write in detail about Literals in Python.	CO1	9 Marks
	b)	Define an identifier, write an identifier rules.	CO1	5 Marks
		(OR)		
2	a)	Write a python script to perform basic arithmetic operations on two values.	CO5	8 Marks
	b)	Evaluate fallowing expressions according to operator precedence i) 4+8*2/2**2. ii) 2*3.5+1//2*3/2.	CO2	6 Marks

UNIT-II

3	a)	Explain while statement in python with example.	CO2	7 Marks
	b)	Write a python script to calculate sum of individual digits of a given number using while.	CO5	7 Marks
		(OR)		
4	a)	Explain the difference between the lists and tuples in python.	CO2	7 Marks
	b)	Write a python script to create a list and add n number of user-defined values to the list and display the same on to the console screen.	CO5	7 Marks

UNIT-III

5	a)	List out various String Methods used in Python.	CO1	7 Marks
	b)	Write a program segment that opens and reads a text file and displays how many lines of text are in the file.	CO3	7 Marks
		(OR)		
6		Determine how many digits a positive integer has by repeatedly dividing by 10 (without keeping the remainder) until the number is less than 10, consisting of only 1 digit. We add 1 to this value for each time we divided by 10. Here is the recursive algorithm: i) If n < 10 return 1. ii) Otherwise, return 1 + the number of digits in n/10 (ignoring the fractional part). Implement this recursive algorithm in Python and test it using a main function that calls this with the values 15, 105, and 15105. (HINT: Remember that if n is an integer, n/10 will be an integer without the fractional part.)	CO5	14 Marks

UNIT-IV

7	a)	Explain the fundamental features of turtle graphics.	CO1	7 Marks
	b)	Explain the fundamental concept of object oriented programming.	CO1	7 Marks
		(OR)		
8		Develop a simple program for bouncing ball using multiple turtles.	CO4	14 Marks

UNIT-V

9		How to reuse a GUI component with class? And explain about Attaching and Extending class components.	CO2	14 Marks
		(OR)		
10		Write a python script to develop a window by adding buttons and callbacks using tkinter and explain the procedure.	CO5	14 Marks

❀ ❀ ❀

CODE No.: 16BT31002 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

SENSORS AND TRANSDUCERS
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Define the term 'Units', 'Absolute Units', 'Fundamental Units' and 'Derived Units'. Cite suitable examples to support the need to follow ethical standards for measuring instruments.	CO6	14 Marks
		(OR)		
2		Differentiate between the deflection and null type of instruments giving suitable examples. Discuss about the selection of a transducer based on their accuracy, sensitivity and suitability for dynamic measurements.	CO4	14 Marks

UNIT-II

3	a)	Apply the different standard inputs for studying the dynamic response of a system. Define and sketch them.	CO2	7 Marks
	b)	An RC circuit consists of a capacitor of 1μF in series with a resistor of 5KΩ.A dc voltage of 50V is suddenly applied across the circuit. Calculate the value of the voltage after i) 5ms and ii) 25ms.	CO3	7 Marks
		(OR)		
4		Derive the transfer function of a thermal system when the heat input rate is suddenly increased from its steady conditions. Discuss the assumptions made.	CO2	14 Marks

UNIT-III

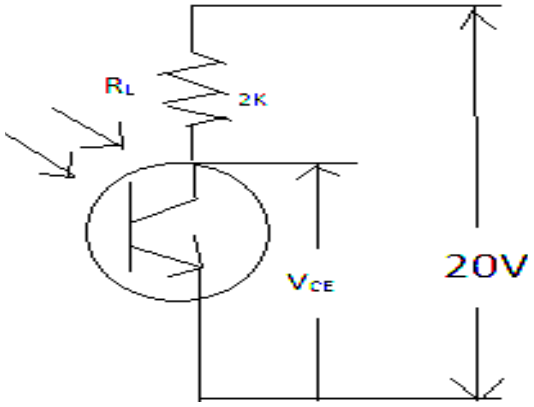
5		Describe the constructional details of a resistance potential divider and derive the expressions for its output voltage when connected across a meter of finite impedance.	CO1	14 Marks
		(OR)		
6		Explain with diagrams, the bonded and unbounded types of strain gauges. For bonded strain gauges, describe the materials used for base, and adhesive materials and also the materials used for leads.	CO1	14 Marks

UNIT-IV

7		Illustrate the process of chemical analysis of liquids in industries which use the principle of electrochemical sensing.	CO5	14 Marks
		(OR)		
8		Describe the construction, principle of working and applications of Hall Effect transducers.	CO1	14 Marks

UNIT-V

9	a)	Explain the principle of working, constructional details and applications of photo transistors.	CO1	7 Marks
	b)	A photo-transistor of circuit shown in figure with the characteristics has a supply voltage of 20V and a collector load resistance of 2KΩ. Determine the output voltage when the illumination level is: i) Zero. ii) 200 w/m² and iii) 400 w/m².	CO3	7 Marks



(OR)

10		Describe the basics of SMART (or) Intelligent sensors.	CO1	14 Marks

❀ ❀ ❀

CODE No.: 16BT31201 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

DISCRETE MATHEMATICAL STRUCTURES

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Find the truth table for the following: i) $(p \vee q) \wedge r$. ii) $(p \vee \sim q) \Rightarrow r$. iii) $(p \downarrow q) \wedge (p \downarrow r)$.	CO1	7 Marks
	b)	$((p \vee \sim q) \wedge (\sim p \vee \sim q)) \vee q$. Is a tautology or not? Justify.	CO1	7 Marks
		(OR)		
2	a)	Identify and explain the converse, inverse and contra positive of the following conditional statement. *"If the flood destroy my house or the fires destroy my house, then my insurance company will pay me".*	CO3	7 Marks
	b)	Write the Negation of the following statement: $\exists x \in R\ x > 3 \Rightarrow x^2 > 9$	CO1	7 Marks

UNIT-II

3	a)	Determine the value of $f^{-1}g(x)$ and $hf\,(g\,f^{-1})\,(hf(x))$ for the functions f, g and h: $R \rightarrow R$ be defined by (R is the set of real numbers, such that $f(x)=x+2$, $g(x) = (1+x^2)^{-1}$ and $h(x)=3$.	CO4	6 Marks
	b)	Examine the functions f and g both of which are from $N \rightarrow N$ to N given by $f(x, y) = x + y$ and $g(x, y) = xy$ are onto but not one-one.	CO2	8 Marks
		(OR)		
4	a)	Define lattice. Also, illustrate properties of lattices.	CO1	6 Marks
	b)	Determine that (S, /) is a lattice, where S=(1,2,3,6) and / is for divisibility prove that this is a distributive lattice.	CO4	8 Marks

UNIT-III

5	a)	Examine whether given set 'S,' S={0,1,2,3,4,5} can be semi group under binary operation Θ5 or not?	CO2	7 Marks
	b)	State and prove Lagrange's theorem.	CO1	7 Marks
		(OR)		
6	a)	Define Algebraic structure. List its properties.	CO1	6 Marks
	b)	Justify whether the set of positive integers N is a monoid with respect to the binary operation * defined as a*b=lcm(a,b), for all a,b belongs to N.	CO5	8 Marks

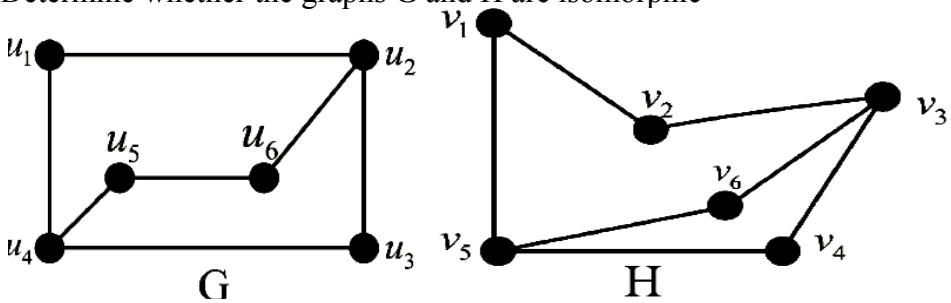
UNIT-IV

7	a)	In a Survey of 500 Television viewers of a sports channel Produced the following information: 285 watch cricket, 195 watch hockey, 115 watch football, 45 watch cricket and football, 70 watch cricket and hockey, 50 watch hockey and foot ball and 50 do not watch any of the three kinds of games. Determine: i) How many viewers in the survey watch all three kinds of games? ii) How many viewers watch exactly one of the sports ?	CO4	5 Marks
	b)	In How many ways can 6 men and 6 women be seated in a row? (i) if any person may sit next to any other. (ii) if men and women must occupy alternative seats.	CO4	4 Marks
	c)	Identify the Coefficient of X^{27} in the expansion of $(X^4+X^5+X^6+\text{-------})^5$.	CO3	5 Marks
		(OR)		

8	a)	Solve the Recurrence Relation $\mathbf{U_n+5U_{n-1}+5U_{n-2}=0,\ n>=0}$, where the initial conditions are $\mathbf{U_0=0}$ and $\mathbf{U_1=2\sqrt{5}}$.	CO4	7 Marks
	b)	If $\mathbf{a_n}$ is a solution of the recurrence relation $\mathbf{a_{n+1}=Ka_n}$ for $\mathbf{n>=0}$ and $\mathbf{a_3=153/49}$ and $\mathbf{a_5=1377/2401}$, what is K?	CO2	7 Marks

UNIT-V

9	a)	Determine whether the graphs G and H are isomorphic	CO2	7 Marks



	b)	Discuss Euler Circuit and Hamilton graph with an example.	CO5	7 Marks

(OR)

10	a)	Analyze Depth first Search algorithm with an example.	CO4	7 Marks
	b)	Define MST. Explain Kruskal's algorithm with an example.	CO3	7 Marks

❀ ❀ ❀

CODE No.: 16BT31501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

OPERATING SYSTEMS

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	State and explain different operating system services.	CO1	7 Marks
	b)	Differentiate between sequential and batch processing.	CO1	7 Marks
		(OR)		
2	a)	What is meant by CPU Scheduling? Explain different scheduling algorithms with examples.	CO1	7 Marks
	b)	Write about Bootstrap program.	CO1	7 Marks

UNIT-II

3	a)	Illustrate peterson's solution to critical section problem.	CO2	7 Marks
	b)	Describe the mutual exclusion implementation with TestAndSet().	CO2	7 Marks
		(OR)		
4	a)	Mention some classical problems of synchronization. Explain any two of them in detail.	CO2	7 Marks
	b)	Elucidate different methods used to recover from deadlock.	CO2	7 Marks

UNIT-III

5	a)	Discuss paging with an example.	CO2	7 Marks
	b)	Consider the following page reference string 1, 2, 3, 5, 2, 3, 5, 7, 2, 3, 8, 6, 4, 3, 2, 2, 3, 6 Assuming there are three memory frames, how many page faults would occur in case of i) LRU ii) Optimal algorithm. Note that initially all frames are empty.	CO2	7 Marks
		(OR)		
6	a)	Write about the performance of demand paging.	CO2	7 Marks
	b)	What is Belady's Anomaly? Explain with an example.	CO2	7 Marks

UNIT-IV

7	a)	Explain with the help of necessary diagrams the file system and directory implementation.	CO3	7 Marks
	b)	Compare contiguous and linked allocation methods for disk space.	CO4	7 Marks
		(OR)		
8		With an illustrative example, distinguish between SSTF, FCFS, SCAN, C-SCAN, LOOK, C-LOOK disk scheduling algorithms.	CO1	14 Marks

UNIT-V

9	a)	Explain the goals and principles of protection.	CO5	7 Marks
	b)	What are access matrices? Explain its implementation.	CO5	7 Marks
		(OR)		
10		Write a short note on (i) Domain of protection (ii) Access Matrix.	CO5	14 Marks

❀ ❀ ❀

CODE No.: 16BT41202 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

JAVA PROGRAMMING
[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What is byte code? What are instance variables?	CO1	7 Marks
	b)	List categories of operators supported by JAVA.	CO2	7 Marks
		(OR)		
2	a)	What is a class? Explain the syntax for declaring a class with an example.	CO1	4 Marks
	b)	Why does JAVA not support goto statements? What is the alternative way of defining goto statement behavior in Java?	CO1	5 Marks
	c)	Explain in detail about constructor overloading with an example.	CO1	5 Marks

UNIT-II

3	a)	Create an abstract class ***Accounts*** with the following details: Data members: i) Balance ii) AccountNumber iii) AccountHoldersName iv) Address Methods: i) Withdrawl() – abstract ii) Deposit()- abstract iii) Display() to show the balance of the account number Create a subclass of this class SavingsAccount and add the following details: Data members: i) RateofInterest Methods: i) calculateAmount() ii) display() t display rate of interest with new balance and full account holder details Create another subclass of the Account class, i.e. CurrentAccount with the following Data members: i) overdraftLimit Method: i) display() to show overdraft limit along with the full account holder details Create objects of these two classes and call their methods. Use appropriate constructors.	CO6	7 Marks
	b)	Design an interface to implement Stack ADT	CO3	7 Marks
		(OR)		
4	a)	How can we access an interface from another interface?	CO1	7 Marks
	b)	What is a package? Explain it with an example and also write how to import packages.	CO1	7 Marks

UNIT-III

5	a)	What are the Exception types? What is a finally block? When and how is it used? Give a suitable example.	CO1	7 Marks
	b)	Design a java program showing the actions form three threads. Use runnable interface to create the threads. Make sure that the main thread always executs last.	CO3	7 Marks

(OR)

6	a)	Create a user-defined exception named checkArgument to check the number of arguments passed through command line. If the number of arguments is less than five, throw the checkArgument exception, else print the addition of all the five numbers.	CO4	7 Marks
	b)	What is multitasking? Is multi threading a form of multitasking?	CO1	7 Marks

UNIT-IV

7		Design a Java applet with the following components Add four labels with Text only, image only, image and text with text displayed at top center, image only at right position. Add four buttons to the Applet - Buttonl with text "Try Me", Button2 with text in the right position. Button3 with the corn image and text in the left position and Button4 with grapes image. Whenever a button is clicked, display a message about the selection in a text field. Make this text field non-editable, so that user cannot change its content. Add keyboard mnemonic to button 3 so that the button can be selected by pressing Alt + C in the keyboard. Add a tooltip to button4, so that it will be displayed when mouse hovers over the button.	CO5	14 Marks

(OR)

8		Design a java program to perform the following using linked list. i) Remove a node form the list. ii) Insert a node at the end of the list. iii) Insert a node anywhere in the existing list. iv) Remove a node anywhere in the existing list.	CO3	14 Marks

UNIT-V

9	a)	What are servlets? What are the three methods that are central to the life cycle of a servlet?	CO1	7 Marks
	b)	Design a servlet which displays current system date and time.	CO3	7 Marks

(OR)

10	a)	Design a java program to implement Mouse and keyboard events.	CO1	12 Marks
	b)	What are the tasks of a servlet?	CO1	2 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations February – 2021

PROBABILITY DISTRIBUTIONS AND STATISTICAL METHODS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Define continuous random variable and probability density function. CO1 4 Marks

b) If the probability density function of a random variable is given by CO4 10 Marks

$F(x) = x$ for $0 < x < 1$

$= 2 - x$ for $1 \le x \le 2$

$= 0$ elsewhere

Find the probabilities that this random variable will take on value

i) Between 0.2 and 0.8 ii) Between 0.6 and 1.2

iii) Greater than 1.8 iv) Between 0.4 and 1.6.

(OR)

2 a) Find k so that the following can serve as the probability density function CO4 7 Marks

$f(x) = kxe^{-4x^2}$ for $x < 0$

$= 0$ for $x \le 0$

b) A random variable X has the following probability function: CO4 7 Marks

X	0	1	2	3	4	5	6	7
P(X)	0	k	2k	2k	3k	k^2	$2k^2$	$7k^2+k$

i) Find k

ii) Evaluate $P(X < 6)$, $P(X \ge 6)$, $P(3 < X \le 6)$

UNIT-II

3 a) The sum and product of the mean and variance of a Binomial distribution are 25/3 and 50/3 respectively, find $P(X \ge 1)$. CO4, CO5 7 Marks

b) The mean and standard deviation of the marks obtained by 1000 students in an examination are respectively 34.4 and 16.5. Assuming the normality of the distribution, find the approximate number of students expected to obtain marks between 30 and 60. CO4 7 Marks

(OR)

4 a) If the probability of a bad reaction from a certain injection is 0.001, determine the chance that out of 2000 individuals more than two will get a bad reaction. CO4 7 Marks

b) If 20% of the memory chips made in a certain plant are defective, what are the probabilities that in a lot of 100 randomly chosen for inspection CO4 7 Marks

i) at most 15 will be defective.

ii) at least 10 will be defective.

UNIT-III

5 Construct the Mean and Range charts from the following data and comment on the process. CO2, CO3 14 Marks

Sample No.	1	2	3	4	5	6	7	8	9	10
Sample Mean	12.8	13.1	13.5	12.9	13.2	14.1	12.1	15.5	13.9	14.2
Sample Range	2.1	3.1	3.9	2.1	1.9	3.0	2.5	2.8	2.5	2.0

(OR)

6 a) Find the regression lines to the given data: CO1, CO2 7 Marks

X	16	21	26	23	28	24	17	22	21
Y	33	38	50	39	52	47	35	43	41

b) Find the rank correlation coefficient to the given data: CO1, CO2 7 Marks

X	68	64	75	50	64	80	75	40	55	64
Y	62	58	68	45	81	60	68	48	50	70

UNIT-IV

7 a) In 64 randomly selected hours of production, the mean and standard deviation of the number of acceptable pieces produced by automatic stamping machine are 1038 and 146 respectively. Does this enable us to reject the null hypothesis $\mu=1000$? Justify your answer. CO1, CO4 7 Marks

b) A manufacturer of bulbs claims that only 2% of his bulbs are defective. A random sample of 400 bulbs from his factory shows that 13 of them are defective. On the evidence of this sample, can we accept the manufacturer's claim? Justify your answer. CO2 7 Marks

(OR)

8 a) The means of two large samples of sizes 1000 and 2000 are 67.5 and 68 respectively. Test the equality of means of the two populations each with standard deviation 2.5. CO1, CO4 7 Marks

b) A machine put out 16 imperfect articles in a sample of 500. After the machine is overhauled, it puts out 3 imperfect articles in a batch of 100. Has the machine improved or not ? Justify your answer. CO2 7 Marks

UNIT-V

9 a) The mean weight loss of n=16 grinding balls after certain length of time in a mill slurry is 34.2 grams with a standard deviation of 0.68 grams. Construct a 99% confidence interval for the true mean loss of such grinding balls. CO4 7 Marks

b) The following random samples are measurements of heat producing capacity in millions of calories per ton of specimens of coal from two mines. Use 0.01 level of significance to test, whether the difference between the means of these two samples is significant? CO4 7 Marks

Mine 1	8260	8130	8350	8070	8340	------
Mine 2	7950	7890	7900	8140	7920	7840

(OR)

10 1072 college students were classified according to their intelligence and Economic conditions. Test whether intelligence is independent of Economic condition at 1% level of significance. CO4 14 Marks

Economic condition	Intelligence			
	Excellent	Good	Mediocre	Dull
Good	48	199	181	82
Not good	81	185	190	106

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations February - 2021

SPECIAL FUNCTIONS AND COMPLEX ANALYSIS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Prove that $\Gamma\left(\frac{1}{2}\right) = \sqrt{\pi}$.	CO1	7 Marks
	b)	Prove that $\frac{\beta(m+1,n)}{m} = \frac{\beta(m,n+1)}{n} = \frac{\beta(m,n)}{m+n}$.	CO4	7 Marks
		(OR)		
2	a)	Prove that $J_{-\frac{1}{2}}(x) = \sqrt{\frac{2}{\pi x}}\cos x$.	CO4	7 Marks
	b)	Express $J_4(x)$ in terms of $J_0(x)$ and $J_1(x)$.	CO4	7 Marks

UNIT-II

3		Define continuity of f(z) at origin. Prove that the function defined by $f(z) = \frac{x^3(1+i) - y^3(1-i)}{x^2+y^2}(z \neq 0), f(0) = 0$ is continuous and the Cauchy Riemann equations are satisfied at the origin yet $f'(0)$ does not exist.	CO1 CO4	14 Marks
		(OR)		
4	a)	Show that polar form of Cauchy Riemann equations are $\frac{\partial u}{\partial r} = \frac{1}{r}\frac{\partial v}{\partial \theta}, \frac{\partial v}{\partial r} = -\frac{1}{r}\frac{\partial u}{\partial \theta}$. Hence deduce that $\frac{\partial^2 u}{\partial r^2} + \frac{1}{r}\frac{\partial u}{\partial r} + \frac{1}{r^2}\frac{\partial^2 u}{\partial \theta^2} = 0$.	CO1 CO4	7 Marks
	b)	If *f(z)* is ananalytic function of *z*, Prove that $\left(\frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2}\right)\left|Rf(z)\right|^2 = 2\left|f'(z)\right|^2$.	CO2	7 Marks

UNIT-III

5	a)	State and prove Cauchy's Integral formula.	CO4	7 Marks
	b)	Construct a series of positive and negative powers of $(z+1)$ for the $f(z) = \frac{7z-2}{(z+1)z(z-2)}$.	CO3	7 Marks
		(OR)		
6	a)	Evaluate $\oint_C \frac{\log z}{(z-1)^3}dz$ where C is $\left|z-1\right| = \frac{1}{2}$ using Cauchy's integral formula.	CO3 CO4	7 Marks
	b)	Construct Laurent's series about $z = 1$ for $f(z) = \frac{e^{2z}}{(z-1)^3}$. Analyze the series and identify the region of convergence	CO2 CO3	7 Marks

UNIT-IV

7	Define the singularity of a function. Determine the poles of the function $f(z) = \frac{z^3}{(z-1)^4(z-2)(z-3)}$ and the residue at each pole, Hence evaluate $\oint_C f(z)dz$, where C is the circle $\|z\| = 2.5$.	CO1 CO4	14 Marks
	(OR)		
8	Evaluate $\int_{-\infty}^{\infty} \frac{x^2}{(x^2+1)(x^2+4)} dx$ by complex variable technique.	CO5	14 Marks

UNIT-V

9	Find the bilinear transformation which maps the points $z = 1, i, -1$ onto the points $w = i, 0, -i$. Hence find (a) the image of $\|z\| < 1$, (b) the invariant points of this transformation.	CO1 CO4	14 Marks
	(OR)		
10	Discuss the transformation $w = e^z$.	CO3 CO4	14 Marks

CODE No.:16BT3HS02 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations February - 2021

MANAGERIAL ECONOMICS AND PRINCIPLES OF ACCOUNTANCY

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	Discuss the nature of Managerial Economics and its role in Business decision making process.	CO1	14 Marks
	(OR)		
2	What is Law of Demand? State and explain the Law of Diminishing returns.	CO1	14 Marks

UNIT-II

3	What are the three stages of short run production function? Why does it not make any economic sense to produce in stage 1 or stage 2?	CO2	14 Marks
	(OR)		
4	Differentiate between: i) Explicit Cost ***Vs*** Implicit Cost. ii) Fixed Cost ***Vs*** Variable Cost. iii) Marginal Cost ***Vs*** Average Cost.	CO2	14 Marks

UNIT-III

5	Explain the various features of a Perfect Competitive Market. How is Price of a commodity determined under it?	CO1	14 Marks
	(OR)		
6	Discuss the Pricing strategies with suitable examples.	CO2	14 Marks

UNIT-IV

7	What are Accounting Concepts and Conventions? Name them and explain any two accounting concepts in detail.	CO1	14 Marks
	(OR)		
8	Write journal entries for the following transactions in the books of Mr. Prem Kumar. 2016 March 1 Started business with Rs. 4,00,000 in cash. March 3 Bought goods from Prasad Rs.3,27,100. March 6 Sold goods to Hariswaroop Rs.1,29,300. March 9 Cash sales Rs.37,200. March 12 Sold goods to Babulal Rs.63,100. March 15 Paid Prasad on account Rs.1,50,000. March 18 Paid Salary to manager Rs.50,000. March 31 Office rent paid to Land Lord Krishna Rs.40,000.	CO2	14 Marks

UNIT-V

9	Explain the distinction between Manual Accounting and Computerized Accounting. Elaborate the advantages and disadvantages of Computerized Accounting.	CO1	14 Marks
	(OR)		

10 From the following trail balance of Bikram, prepare Trading and Profit & Loss Account for the year ending 31st March 2016 and the Balance Sheet as on that date. CO2 14 Marks

Particulars	Dr. Rs.	Particulars	Cr. Rs.
Electricity	14,000	Interest	16,000
Land	3,56,000	Discounts	6,000
Wages	50,000	Sales	8,00,000
Opening Stock	20,000	Returns	10,000
Rent	24,000	Creditors	60,000
Office expenses	30,000	Capital	3,02,000
Building	4,00,000	Bills payable	15,000
Salaries	90,000		
Power, Gas and Water	30,000		
Returns	20,000		
Furniture	1,15,000		
Debtors	60,000		
Total	**12,09,000**	**Total**	**12,09,000**

Additional information:

i) Closing stock was valued at Rs.50,000.
ii) Provide depreciation @ 5% on buildings and 10% on furniture.
iii) Write off bad debts Rs.2,500.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations February – 2021

CONSTRUCTION PLANNING AND PROJECT MANAGEMENT
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the stages of planning by different agencies.	CO1	7 Marks
	b)	List out the salient features of workmen's compensation act of 1923.	CO8	7 Marks
		(OR)		
2	a)	Describe the labour legislation in India.	CO8	7 Marks
	b)	What are the basic concepts in the development of construction plans?	CO1	7 Marks

UNIT-II

3	a)	Write down the ABC classification of materials.	CO9	7 Marks
	b)	Differentiate resource smoothing and resource leveling.	CO9	7 Marks
		(OR)		
4	a)	Explain about: i) Concreting plant and equipment. ii) Earth compaction equipment. iii) Hoisting equipment.	CO5	7 Marks
	b)	Write a brief note on operation and maintenance of equipment.	CO5	7 Marks

UNIT-III

5	a)	What is bar chart and what are its shortcomings?	CO5	7 Marks
	b)	What is project management? What are the main causes of project failure?	CO1	7 Marks
		(OR)		
6	a)	Discuss the methods of scheduling bringing out their importance in projects.	CO1	7 Marks
	b)	Describe various phases of project management.	CO1	7 Marks

UNIT-IV

7	a)	What are the different types of networks? Write the advantages of network techniques over conventional techniques.	CO1	7 Marks
	b)	The following information applies to particular project. The expected times are given below.	CO3	7 Marks

Activity:	0-1	1-3	1-2	2-3	1-4	3-4	4-5
Duration:	3	16	6	8	10	5	3

Draw the network diagram and locate critical path.

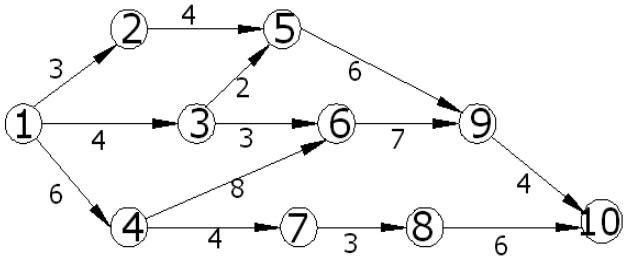
(OR)

8	a)	What is dummy? How and where should a dummy be used?	CO1	6 Marks
	b)	Illustrate Hierarchies in the development of network with an example.	CO4	8 Marks

UNIT-V

9	a)	How do you evaluate the probability of completion time for a project?	CO4	7 Marks
	b)	What do you mean by CPM? What are the time estimates used in CPM and explain their significance?	CO3	7 Marks
		(OR)		

10 a) Determine the Critical path for the network given below. CO2 7 Marks



b) Define "optimistic time estimate", "pessimistic time" and "most likely time estimate". CO2 7 Marks

CODE No.:16BT30102 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations February – 2021

FLUID MECHANICS AND HYDRAULIC MACHINERY

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define the following terms. i) Specific gravity. ii) Surface tension. iii) Pascal's Law.	CO1	6 Marks
	b)	A vertical cylinder of diameter 200mm rotates concentrically inside another cylinder of diameter 202mm. Both the cylinders are 250mm high. The space between the cylinders is filled with a liquid whose viscosity is unknown. Determine the viscosity of the fluid if a torque of 25N-m is required to rotate the inner cylinder at 150 r.p.m.	CO2	8 Marks
		(OR)		
2	a)	What is hydrostatic law? Differentiate gauge and absolute pressures.	CO1	6 Marks
	b)	A circular plane plate of diameter 3m lies in water in such a way that the plane makes an angel of 30^0 with the free water surface. Determine the total pressure and center of pressure when the upper edge is 2m below the free water surface.	CO2	8 Marks

UNIT-II

3	a)	Derive the continuity equation in differential form for three dimensional fluid flows.	CO1	7 Marks
	b)	An inclined pipe line carrying oil of specific gravity 0.85 changes in diameter from 300mm at section 1 to 600mm diameter at section 2 which is 4m at a higher level. If the pressures at section 1 and 2 are 100kN/m^2 and 60kN/m^2 respectively and discharge is 300 litres/sec., determine the loss of head between the two sections and direction of flow.	CO2	7 Marks
		(OR)		
4	a)	Define: i) Stream line. ii) Path line.	CO1	6 Marks
	b)	A swimming pool 12m long and 7m wide holds water to a depth of 2m. If the water is discharged through an opening of area 0.2m^2 at the bottom of the pool, find the time required to empty the tank. Take coefficient of discharge for the opening as 0.6.	CO5	8 Marks

UNIT-III

5	a)	Explain briefly: i) Hydraulic gradient line. ii) Total energy line. iii) Moody's chart.	CO1	6 Marks
	b)	Two reservoirs have difference of water levels of 6m. They are connected by pipe system which consists of a single pipe of 600mm diameter for the first 3000m and then two pipes in parallel, each of 300mm diameter and 3000m in length. Calculate the rate of flow. Assume friction factor as 0.04 for all pipes.	CO2	8 Marks
		(OR)		

6	a)	State Buckingham's π theorem and explain the method for dimensional analysis.	CO1	8 Marks
	b)	In 1:30 model of a spillway, the velocity and discharge are 1.5m/s and 2.0m^3/s. Find the corresponding velocity and discharge in the prototype.	CO4	6 Marks

UNIT-IV

7	a)	What is specific energy? Derive the expressions for critical velocity and critical depth in a rectangular channel.	CO1	7 Marks
	b)	A sluice gate discharges water into horizontal rectangular channel with a velocity of 10m/s and depth of flow of 1m. Determine the post jump depth and loss of head in the jump.	CO2	7 Marks

(OR)

8	a)	Derive the dynamic equation of gradually varied flow.	CO1	7 Marks
	b)	A 6m wide rectangular channel conveys 14m^3/s of water at a depth of 1.2m. Calculate: i) Specific energy of the flowing fluid. ii) Critical depth, critical velocity and minimum specific energy.	CO1	7 Marks

UNIT-V

9	a)	Explain the following: i) Specific speed of a turbine. ii) Net positive suction head of a centrifugal pump. iii) Governing of turbine.	CO1	6 Marks
	b)	Design a Francis turbine runner with the following data: Net head : 68 m Speed of the runner : 750 r.p.m Hydraulic efficiency : 94% Overall efficiency : 85% Flow ratio : 0.15 Breadth ratio : 0.1 Outer diameter of the runner is twice the inner diameter. Also assume 5% of the circumferential area of the runner to be occupied by the thickness of the vanes. Velocity of flow remains constant throughout and flow is radial at exit.	CO3	8 Marks

(OR)

10	a)	Write a short note on: i) Functions of a draft tube. ii) Performance characteristic curves of a turbine.	CO1	6 Marks
	b)	A three stage centrifugal pump has impellers 400mm in diameter and 20mm wide at outlet. The vanes are curved back at the outlet at 45^0 and reduce the circumferential area by 10%. The manometric efficiency is 90% and the overall efficiency is 80%. The pump is running at 1000 r.p.m and delivering 0.05m^3/s. Determine the head generated by the pump and shaft power required to run the pump.	CO2	8 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations February – 2021

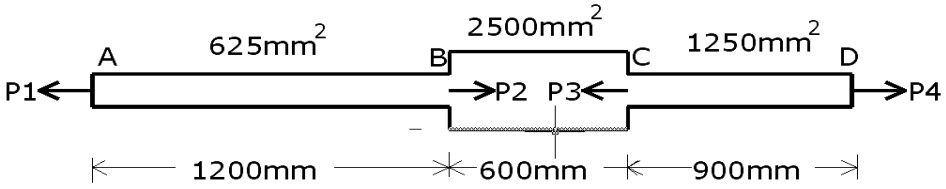
MECHANICS OF SOLIDS
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 A member ABCD is subjected to point loads P1, P2, P3 and P4 as shown in figure. Calculate the force P2 necessary for equilibrium if P1=45kN, P3=450kN and P4=130kN. Determine the total elongation of the member, assuming the modulus of elasticity as $2.1 \times 10^5 N/mm^2$ CO1 14 Marks



(OR)

2 A circular rod of 90mm diameter and 450mm long is subjected to a tensile force of 800kN. Determine the modulus of rigidity, bulk modulus and change in volume if Poisson's ratio = 0.3 and young modulus is $E = 2.1 \times 10^5 N/mm^2$. CO1 14 Marks

UNIT-II

3 A beam AB 5m long is simply supported at A and B. it is loaded with point loads of 20kN, 30kN and 20kN at distances of 1m, 3m and 4m respectively from the support A and a uniformly distributed load at the rate of 20kN/m over length of 2m, the beginning of the U.D.L. being at a distance of 2m from A. draw the bending moment and shear force diagrams. CO2 14 Marks

(OR)

4 a) Explain the relation between bending moment and shear force. CO2 6 Marks

b) A simply supported beam of span L is loaded with distributed load of intensity zero at the ends and **w** per unit length at the centre. Plot the shear force and bending moment diagrams. CO2 8 Marks

UNIT-III

5 Derive the basic bending equation for a beam of elastic material. State clearly the assumptions made in simple theory of bending. CO2 14 Marks

(OR)

6 A beam of triangular cross-section with base **b** and height **h**, is used with the base horizontal. Calculate the intensity of maximum shear stress and plot the variation of shear stress intensity along the section. CO2 14 Marks

UNIT-IV

7 State the assumptions and derive the torsion equation for a solid shaft subjected to a torque T. CO3 14 Marks

(OR)

8 In a hollow circular shaft of outer and inner diameters of 20cm and 10cm respectively, the shear stress is not to exceed $40N/mm^2$. Find the maximum torque which the shaft can safely transmit. CO3 14 Marks

UNIT-V

9	Find the ratio of thickness to internal diameter for a table subjected to internal pressure, when the pressure is $5/8^{th}$ of maximum permissible circumferential stress. Find the increase in internal diameter of such a tube 100mm internal diameter, when the internal pressure is $90N/mm^2$. Take E = 2 x $105N/mm^2$ and Poisson's ratio = 0.286.	CO5	14 Marks

(OR)

10	A cylindrical vessel whose ends are closed by means of rigid plane plates is made of steel plate 3mm thick. The internal length and diameter of vessel are 50cm and 25cm respectively. Determine the longitudinal and circumferential stress in the cylindrical vessel due to internal fluid pressure of 3Mpa. Also calculate increase in length, diameter and volume. Take (1/m = 0.5), E = 200Gpa.	CO4	14 Marks

CODE No.:16BT30104 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC16) Supplementary Examinations February – 2021

SURVEYING
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	With a neat sketch, explain the working principles of optical square and cross staff and give a field usage description of optical square and cross staff.	CO1	14 Marks
	(OR)		
2	A 20-m tape was tested before starting the day's work and found to be 0.02m too short. At the end of the day it was tested again and found to be 0.06m too long. If the total length measured during the day was 1243.5m, find the true length.	CO4	14 Marks

UNIT-II

3	Explain two-point problem and the method of solution for plane table surveying and also explain the likely errors that may occur in plane table surveying.	CO2	14 Marks
	(OR)		
4	Explain the rise and fall method of reduction of levels.	CO2	14 Marks

UNIT-III

5	Explain the step by step procedure to measure the horizontal and vertical angles between two-point with the help of neat sketch.	CO2	14 Marks
	(OR)		
6	Derive the formula for distance and elevation in the tangential method with the help of neat sketch and explain the principle of stadia method.	CO4	14 Marks

UNIT-IV

7	A chain line was divided into eight sections of 12m each. Offsets were taken from the middle of each section to a boundary. The offsets were measured (in meters) as follows from the left end: 5.63, 6.84, 7.23, 6.95, 7.58, 5.97, 5.84 and 4.95. Find the area between the chain line and the boundary.	CO2	14 Marks
	(OR)		
8	Derive the expressions for the elements of compound curve and vertical curve with neat sketches.	CO4	14 Marks

UNIT-V

9	Briefly explain the fundamental quantities measured by total station. How they can be used to find the level and coordinates of observed station.	CO5	14 Marks
	(OR)		
10	Discuss briefly the preparations required for measurement with total station and list various input data to be given for distance measurement with total station.	CO6	14 Marks

❀ ❀ ❀

CODE No.:16BT30201 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations February – 2021

DC MACHINES

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Describe the different methods of excitation of DC generators with suitable diagrams.	CO1	6 Marks
	b)	A 4-pole DC shunt generator with shunt field resistance of 100Ω and armature resistance of 1Ω has 378 wave connected conductors in its armature and the generator is driven at 1000 r.p.m. Calculate the power absorbed by the load.	CO4	8 Marks

(OR)

2	a)	Derive expression for maximum efficiency in DC generators.	CO2	6 Marks
	b)	A 10KW, 250V DC shunt generator has total rotational losses of 600W. Its armature and shunt field resistance are 0.5Ω and 125Ω respectively. Calculate the efficiency at rated load.	CO4	8 Marks

UNIT-II

3	a)	Develop an expression for the demagnetizing and cross magnetizing armature ampere-turns in a DC generator.	CO2	7 Marks
	b)	A 4-pole DC generator has an output of 120A at 400V, the wave connected armature has 980 conductors. The brushes are advanced by 3 degrees from the neutral axis. Find *(i)* AT*d* /pole, *(ii)* AT*c*/pole.	CO4	7 Marks

(OR)

4	a)	With neat diagrams, describe the phenomenon of armature reaction in a dc machine. Discuss its effects.	CO1	7 Marks
	b)	What is meant by reactance voltage and derive expression for reactance voltage.	CO2	7 Marks

UNIT-III

5	a)	Describe critical speed and critical resistance of a DC shunt generator and explain how to obtain these from the OCC curve.	CO1	7 Marks
	b)	Two shunt generators operating in parallel given a total output of 600A. One machine has an armature resistance of 0.2Ω and a generator voltage of 455V and the other an armature resistance of 0.025Ω and a generated voltage of 460V. Calculate the terminal voltage and the Kilowatt output of each machine. Neglect field currents.	CO4	7 Marks

(OR)

6	a)	Describe the parallel operation of two DC shunt generators. Why the generators with drooping characteristics are best suited?	CO1	6 Marks
	b)	A DC series generator having external characteristics which is a straight line through zero to 50V at 200A is connected as a booster between a station bus bar and a seeder of 0.3Ω resistances. Calculate the voltage different between the station bus bar and the far end the seeder at a current of (i) 200A and (ii) 50A.	CO4	8 Marks

UNIT-IV

7	a)	Derive the Torque Equation of DC motor.	CO2	6 Marks
	b)	A 6-pole DC shunt motor has a wave-connected armature with 87 slots, each slot containing six conductors. The flux per pole is 30mWb and the armature has a resistance of 0·10Ω. Calculate the speed when the motor is connected to a 250 V supply and taking an armature current of 80 A.	CO4	8 Marks

(OR)

8	a)	Draw and describe the mechanical characteristics of DC series and shunt motor.	CO1	6 Marks
	b)	A 230V, DC shunt motor, takes an armature current at 3.33A at rated voltage and at a no load speed of 1000 r.p.m. The resistances of the armature circuit and field circuit are 0.3Ω and 160Ω respectively. The line current at full load and rated voltage is 40A. Calculate at full load, the speed and the developed torque in case the armature reaction weakens the no load flux by 4%.	CO4	8 Marks

UNIT-V

9	a)	Describe Field Test for obtaining the efficiency of two similar DC series machines.	CO1	6 Marks
	b)	In a retardation test on a DC motor with its field normally excited, the speed fell from 1525 r.p.m to 1475 r.p.m in 25sec. With an average load of 1KW supplied by the armature. The same speed drop occurred in 20sec. Find out the moment of inertia of rotating parts in Kg m^2.	CO4	8 Marks

(OR)

10	a)	List the merits and demerits of Swinburne's test	CO1	4 Marks
	b)	The HOPKINSON'S test on two similar shunt machines give the following full data line voltage is 110volts, line current is 48amps, motor armature current is 230amps, field currents are 3amps and 3.5amps. Armature resistance of each is 0.035Ω. Calculate the efficiency of each machine assuming a brush contact drop of 1 volt per brush.	CO4	10 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations February – 2021

ELECTROMAGNETIC FIELDS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain Electric Field Intensity, Electric Flux Density and the relation between them.	CO1	5 Marks
	b)	A 2μC point charge is located at A(4,3,5) in free space. Find E_ρ, E_ϕ and E_z at P(8,12,2).	CO3	5 Marks
	c)	Calculate the work done in moving a 4C charge from B (1, 0, 0) to A(0, 2, 0) along the path y=2-2x, z=0 in the field E= : (i) 5 a_x V/m. (ii) 5x a_x V/m.	CO3	4 Marks
		(OR)		
2	a)	A circular disk of radius 'a' is uniformly charged with σ C/m^2. The disk lies on the z=0 plane with its axis along the z-axis. i) Show that at point *(0,0,h)*, $\vec{E} = \frac{\sigma}{2\varepsilon}\left\{1 - \frac{h}{\left[h^2 + a^2\right]^{1/2}}\right\}\vec{a}_z$. ii) From this, derive the $\vec{E}$ field due to an infinite sheet of charge on the *z=0* plane.	CO2	10 Marks
	b)	Derive the expression for potential Gradient.	CO2	4 Marks

UNIT-II

3	a)	Derive the expression for energy density in a static electric field.	CO1	4 Marks
	b)	Show that the tangential components are equal at the dielectric-dielectric interface. Also explore the analysis to derive relation between tangential components for insulated conductor.	CO4	10 Marks
		(OR)		
4	a)	Derive the expression for electric field and potential for the dipole.	CO1	7 Marks
	b)	Apply solution of Laplace's equation to derive the expression for capacitance of a coaxial cable.	CO4	7 Marks

UNIT-III

5	a)	Derive expression for H at any point in cylindrical system due to a filamentary conductor carrying a current I on z axis from **$-\infty < z < \infty$.**	CO5	6 Marks
	b)	Define magnetic field intensity and magnetic flux density. Give the relation between them.	CO2	5 Marks
	c)	Mention the significance of permeability.	CO2	3 Marks
		(OR)		
6	a)	Find the magnetic field intensity at a point on the axis, 5m from the centre of a circular coil of area $100cm^2$ and carrying a current of 50A.	CO3	8 Marks
	b)	Derive ∇ X H = J. Justify this equation is valid for static magnetic fields.	CO4	6 Marks

UNIT-IV

7	a)	Derive the expression for force and Torque on a closed loop carrying current in the magnetic field.	CO5	7 Marks
	b)	Derive the expressions for statically induced and dynamically induced EMF in case of electromagnetic fields	CO4	7 Marks
		(OR)		

8	a)	Evaluate the forces per unit length on two long, straight, parallel conductors if each carries a current of 10.0A in the same direction and the separation distance is 0.20m.	CO3	6 Marks
	b)	In a double layered perfect dielectric insulated current carrying cable, identify the changes in magnetic field parameters between the dielectrics.	CO4	8 Marks

UNIT-V

9	a)	State and explain Faradays laws of electromagnetic induction.	CO4	7 Marks
	b)	Explain inconsistency of Ampere's law.	CO4	7 Marks

(OR)

10	a)	Write Maxwell's equations for time varying EM fields in both differential and integral form.	CO2	8 Marks
	b)	A parallel plate capacitor with plate area of $10cm^2$ and plate separation of 6mm has a voltage $50\sin(10^3t)$ volts required to its plates. Determine the displacement current, assuming $\boldsymbol{\varepsilon} = 2\,\boldsymbol{\varepsilon_0}$	CO3	6 Marks

CODE No.:16BT30203 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations February – 2021

SIGNALS, SYSTEMS AND NETWORKS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

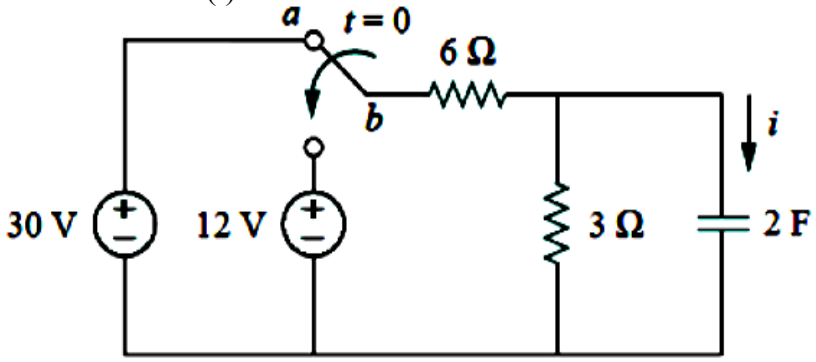
1	a)	Write about elementary continuous time signals in detail.	CO1	7 Marks
	b)	Determine whether the following systems are linear or not $dy(t)/dt + 3ty(t) = t2\,x(t)$ and $y(n) = 2x(n) + 1/x(n-1)$.	CO2	7 Marks
		(OR)		
2	a)	Find the impulse response of causal LTI systems described by the following differential equation. $\frac{d^2y(t)}{dt^2} + 5\frac{d\,y(t)}{dt} + 6y(t) = \frac{d^3x(t)}{dt^3} + 2\frac{d^2x(t)}{dt^2} + 3x(t)$.	CO4	7 Marks
	b)	Distinguish between the following. i. Continuous time signal and discrete time signal. ii. Unit step and Unit Ramp functions. iii. Periodic and Aperiodic Signals.	CO2	7 Marks

UNIT-II

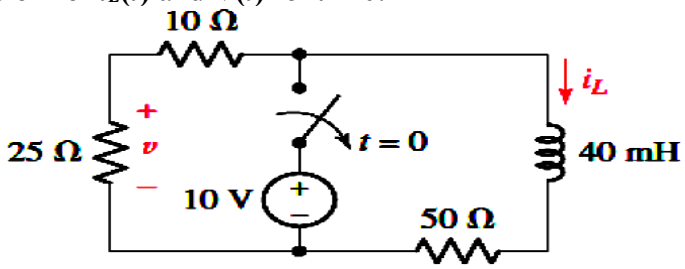
3	a)	Find the Laplace Transform and ROC of the signal $(t) = e - a(t) + e - btu(t)$	CO2	7 Marks
	b)	Distinguish between Fourier series Analysis and Fourier Transforms.	CO2	7 Marks
		(OR)		
4	a)	Determine the Fourier Transform for double exponential pulse whose function is given by (t) = e – 2 | t |. Also draw its magnitude and phase spectra.	CO5	7 Marks
	b)	Determine the initial value and final value of signal x(t) whose Laplace Transform is, $X(s) = \frac{2s+5}{s(s+3)}$.	CO5	7 Marks

UNIT-III

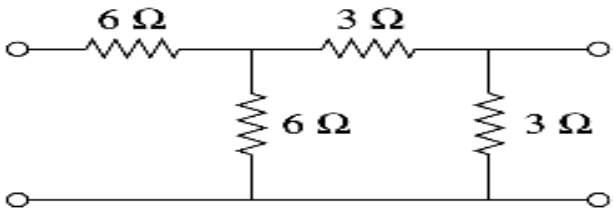
5	a)	The switch has been in position a for long time At t = 0 it moves to position b. Calculate i(t) for t > 0.	CO5	7 Marks



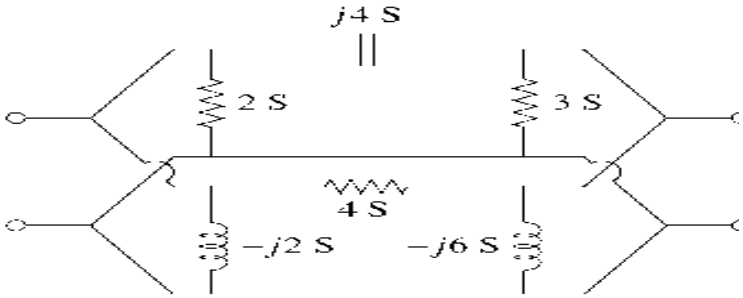
	b)	Derive the expression for the transient response of series R-L-C circuit driven by sinusoidal forcing function.	CO2	7 Marks
		(OR)		

6	a)	The switch is closed for longer time. At t equal to 0 it is opened. Obtain the expression for $i_L(t)$ and $v(t)$ for $t > 0$.	CO4	7 Marks
				
	b)	Derive the expressions for natural and transient response of a series RL circuit excited by a DC voltage source and plot the responses as a function of line.	CO2	7 Marks

UNIT-IV

7	a)	Calculate the Y parameters for the two port network shown below.	CO4	7 Marks
				
	b)	Explain in detail about series and parallel connetion of 2 two port networks.	CO1	7 Marks

(OR)

8	a)	Find the Y parameters of the figure given below.	CO4	7 Marks
				
	b)	Convert z parameter into the h parameters.	CO2	7 Marks

UNIT-V

9	a)	Explain in detail constant K- Low pass filter and constant K- High pass filter.	CO2	7 Marks
	b)	Design m- derived LPF with a cut off frequency of 2K Hz and frequency of attenuation 2100Hz. Give design impedance is 400Ω.	CO3	7 Marks

(OR)

10	a)	Explain in detail m-derived T – Section and m-derived π – Section filter.	CO1	7 Marks
	b)	Design a constant K HPF for a cutoff frequency of 2KHz. Given R_o = 500Ω.	CO3	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC16) Supplementary Examinations February – 2021

ELECTRICAL TECHNOLOGY

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Derive EMF equation of a DC generator.	CO2	7 Marks
	b)	A 1500KW, 550V, 16 pole separately excited DC generator runs at 1500 r.p.m. What must be the useful flux/pole if there are 2500 conductors in the armature is lap connected? The full load armature copper loss is given as 25KW.	CO4	7 Marks
		(OR)		
2	a)	Explain how a Swinburne's test is conducted on DC shunt machine.	CO5	7 Marks
	b)	A 240 V, 4 pole wave connected shunt motor gives 1119 KW when running at 1000 r.p.m and drawing an armature current of 50A. The shunt field resistance is 240Ω. The armature has 540 conductors. Armature resistance is 0.1Ω. Find i) Gross torque. ii) Shaft torque iii)Useful flux/pole. Take total brush voltage drop as 2V.	CO4	7 Marks

UNIT-II

3	a)	Explain the working of single phase transformer with the help of a phasor diagram.	CO1	7 Marks
	b)	A single phase working at unity pf has an efficiency of 90% at both half-full load and full load of 1 KW. Calculate its efficiency at 70% of full load.	CO4	7 Marks
		(OR)		
4	a)	Discuss with neat sketch the equivalent circuit of transformer on load.	CO2	7 Marks
	b)	The primary and secondary windings of 40KVA, 6600/250V single phase transformer have resistances of 10Ω and 0.02Ω respectively. Total leakage reactance of 35Ω referred to primary winding. Find full load regulation of power factor of 0.8 lag.	CO4	7 Marks

UNIT-III

5	a)	Derive relationship between voltages and currents in 3-phase star connected system.	CO2	7 Marks
	b)	Three coils of resistance 4Ω and reactance 3Ω are connected in delta across 400V, 50Hz supply. Find the current in each phase, line current in each phase, line current, real power and reactive power.	CO4	7 Marks
		(OR)		
6	a)	With the help of a circuit and phasor diagrams, show that the total power in a 3 phase, 3-wire star connected balanced load can be measured with the help of one wattmeter.	CO2	7 Marks
	b)	Discuss the advantages of a poly phase system.	CO1	7 Marks

UNIT-IV

7	a)	Derive an expression for the torque of an induction motor and obtain the condition for maximum torque.	CO2	7 Marks
	b)	A 3 phase induction motor has 2 poles and is connected to 400V, 50Hz supply. Calculate the actual rotor speed and rotor frequency when the slip is 4%.	CO4	7 Marks
		(OR)		

8	a)	Derive the EMF equation of an alternator	CO2	7 Marks
	b)	A 3 phase 10KVA, 400V, 50Hz alternator has per phase armature resistance and synchronous reactance of 0.5Ω and 2.5Ω respectively. Calculate generated emf corresponding to full load at unity power factor.	CO4	7 Marks

UNIT-V

9	a)	Discuss the different starting methods of single phase induction motor.	CO1	7 Marks
	b)	Discuss the applications of single phase induction motor.	CO6	7 Marks

(OR)

10	a)	Why a single phase induction motor is not self starting.	CO2	7 Marks
	b)	Explain about the constructional details of shaded pole motor.	CO1	7 Marks

CODE No.: 16BT30301 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations February – 2021

ENGINEERING METALLURGY
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain L-D process.	CO1	5 Marks
	b)	Explain the advantages of Vacuum Melting and give the description of any one such furnace.	CO2	9 Marks
		(OR)		
2		Explain Cupola furnace with neat sketch and indicate zones in it.	CO1	14 Marks

UNIT-II

3	a)	Discuss the allotropy of Iron.	CO4	4 Marks
	b)	Explains Iron–Carbon equilibrium diagram with a neat sketch.	CO4	10 Marks
		(OR)		
4	a)	What is Gibbs phase rule? Explain with an example.	CO4	6 Marks
	b)	Explain Lever rule with an example.	CO4	8 Marks

UNIT-III

5	a)	What is the purpose of Heat Treatment?	CO3	5 Marks
	b)	Write the differences between Annealing and Normalizing.	CO3	9 Marks
		(OR)		
6		Explain TTT diagram and discuss Bainite Transformation.	CO3	14 Marks

UNIT-IV

7		Explain: i) Carburizing. ii) Nitriding. iii) Cyaniding.	CO3	14 Marks
		(OR)		
8		Explain the TEM with a neat sketch.	CO5	14 Marks

UNIT-V

9		Explain the Production powders with neat sketches.	CO6	14 Marks
		(OR)		
10		What is Powder Metallurgy? Explain the process with a diagram. Mention the advantages of Powder Metallurgy over Stir Casting.	CO6	14 Marks

❀ ❀ ❀

CODE No.: 16BT30302 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations February – 2021

KINEMATICS OF MACHINERY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

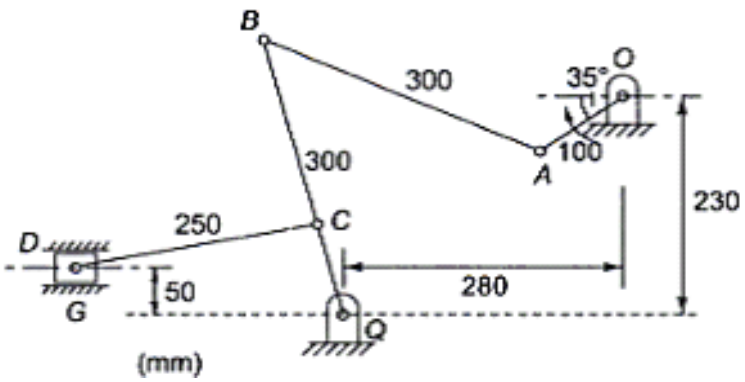
1	a)	What are quick-return mechanisms? Where are they used? Discuss the functioning of any one of them.	CO1	7 Marks
	b)	Distinguish between: i) Mechanism and Machine. ii) Analysis and Synthesis of mechanisms. iii) Kinematics and dynamics.	CO2	7 Marks

(OR)

2	a)	Explain Grubler's criterion for determining degree of freedom for mechanisms. Using Grubler's criterion for plane mechanism, prove that the minimum number of binary links in a constrained mechanism with simple hinges is four.	CO1	7 Marks
	b)	Identify the kinematic chains to which the following mechanisms belong: i) Steam engine mechanism. ii) Beam engine. iii) Whitworth quick return motion mechanism. iv) Elliptical trammels.	CO6	7 Marks

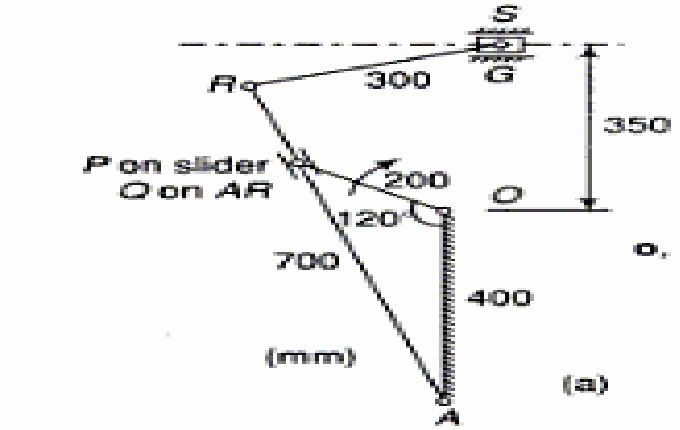
UNIT-II

3		The figure shows a mechanism in which OA=QC=100mm, AB = OB = 300mm and CD=250mm. The crank OA rotates at 150 r.p.m in the clockwise direction. Determine: i) Velocity of the slider at D. ii) Angular velocities of links QB and AB. iii) Rubbing velocity at the pin B which is 40mm in diameter.	CO2	14 Marks



(OR)

4	a)	Discuss the three types of instantaneous centres for a mechanism.	CO2	4 Marks
	b)	Various dimensions of Quick return mechanisms of slotted lever type are given OA=400mm, OP=200mm, AR=700mm, RS=300mm. For the configuration show determine the acceleration of cutting tool at S and angular acceleration of the link RS. The crank RP rotates at 210 r.p.m.	CO2	10 Marks



UNIT-III

5	a)	What are straight line mechanisms? Describe one type of exact straight line motion mechanism with the help of a sketch.	CO2	7 Marks
	b)	Two shafts with an included angle of 160° are connected by a Hooke's joint. The driving shaft runs at a uniform speed of 1500 r.p.m. The driven shaft carries a flywheel of mass 12kg and 100mm radius of gyration. Find the maximum angular acceleration of the driven shaft and the maximum torque required.	CO2	7 Marks

(OR)

6	a)	Describe the Watt's parallel mechanism for straight line motion and derive the condition under which the straight line is traced.	CO2	7 Marks
	b)	The angle between the axes of two shafts connected by Hooke's joint is 18°. Determine the angle turned through by the driving shaft when the velocity ratio is maximum and unity.	CO2	7 Marks

UNIT-IV

7	a)	Sketch two teeth of a gear and show the following. Face, flank, top land, bottom land, addendum, dedendum tooth thickness, space width, face width and circular pitch.	CO4	7 Marks
	b)	How can you deduce the advantages of involutes systems over cycloidal system?	CO4	7 Marks

(OR)

8	a)	What is the difference between a simple gear train and a compound gear train? Explain with the help of sketches.	CO4	7 Marks
	b)	An epicyclic gear consists of a pinion, a wheel of 40 teeth and an annulus with 84 internal teeth concentric with the wheel. The pinion gear with the wheel and the annulus. The arm that carries the axis of the pinion rotates at 100 r.p.m. If the annulus is fixed, find the speed of the wheel. If wheel is fixed, find the speed of annulus.	CO3	7 Marks

UNIT-V

9	a)	Draw the displacement, velocity and acceleration diagrams for a follower when it moves with uniform acceleration and retardation. Derive the expression for velocity and acceleration during outstroke and return stroke of the follower.	CO5	4 Marks
	b)	It is required to set out the profile of a cam with oscillating follower for the following motion : i) Follower to move outward through an angular displacement of 20° during 90° of cam rotation. ii) Follower to dwell for 45° of cam rotation. iii) Follower to return to its original position of zero displacement in 75° of cam rotation. iv) Follower to dwell for the remaining period of the revolution of the cam. The distance between the pivot centre and the follower roller centre is 70 mm and the roller diameter is 20 mm. The minimum radius of the cam corresponds to the starting position of the follower as given in (i). The location of the pivot point is 70 mm to the left and 60 mm above the axis of rotation of the cam. The motion of the follower is to take place with S.H.M. during out stroke and with uniform acceleration and retardation during return stroke.	CO5	10 Marks

(OR)

10		A cam rotating clockwise at a uniform speed of 1000 r.p.m. is required to give a roller follower the motion defined below : i) Follower to move outwards through 50mm during 120° of cam rotation. ii) Follower to dwell for next 60° of cam rotation. ii) Follower to return to its starting position during next 90° of cam rotation, iv) Follower to dwell for the rest of the cam rotation. The minimum radius of the cam is 50mm and the diameter of roller is 10mm. The line of stroke of the follower is off-set by 20mm from the axis of the cam shaft. If the displacement of the follower takes place with uniform and equal acceleration and retardation on both the outward and return strokes, draw profile of the cam and find the maximum velocity and acceleration during out stroke and return stroke.	CO6	14 Marks

CODE No.: 16BT30303 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations February – 2021

MANUFACTURING TECHNOLOGY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	What are the important factors to be considered in casting?	CO1	7 Marks
	b)	State the application of sweep and skeleton pattern.	CO2	7 Marks
		(OR)		
2	a)	Discuss the various elements that comprise the gating system.	CO3	7 Marks
	b)	State the various methods for testing moulding sand.	CO3	7 Marks
		UNIT-II		
3	a)	Distinguish between permanent mould casting and die casting.	CO4	7 Marks
	b)	Describe the procedure of making castings by the investment casting process.	CO3	7 Marks
		(OR)		
4	a)	What are the methods of non-destructive testing used in foundries?	CO4	7 Marks
	b)	Explain casting defects with causes and their remedies.	CO4	7 Marks
		UNIT-III		
5	a)	Sketch and explain various types of rolling mills.	CO5	7 Marks
	b)	Discuss various types of extrusion processes with neat sketches.	CO5	7 Marks
		(OR)		
6	a)	Describe about progressive die and compound die.	CO4	7 Marks
	b)	Explain the explosive forming process with neat sketch.	CO5	7 Marks
		UNIT-IV		
7	a)	With the help of neat sketch, explain the working principle of submerged welding process and mention its applications.	CO1	7 Marks
	b)	With the help of neat sketch, explain the working principle of spot welding process.	CO1	7 Marks
		(OR)		
8	a)	What are the some of the important welding defects? Discuss briefly.	CO4	7 Marks
	b)	Compare the process of soldering and brazing.	CO1	7 Marks
		UNIT-V		
9	a)	What are the different types of plastics? Discuss briefly.	CO1	7 Marks
	b)	With the help of neat sketch, explain the injection moulding process.	CO4	7 Marks
		(OR)		
10	a)	Explain the various steps required to manufacture a plastic bottle using blow moulding process with neat sketch.	CO5	7 Marks
	b)	With the help of neat sketch, explain the process of transfer moulding.	CO5	7 Marks

❀ ❀ ❀

CODE No.: 16BT30304 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations February – 2021

STRENGTH OF MATERIALS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

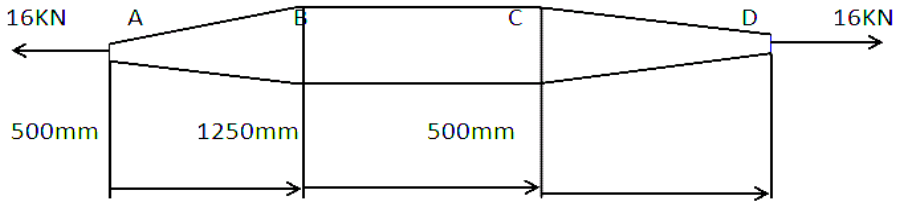
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Draw stress strain diagram for ductile material, marks the salient points and explain each of them in detail.	CO1	6 Marks
	b)	Three steel bars are made with cross sectional shape of circular with diameter 12mm, square of side 12mm and an equilateral triangle of side 12mm. They are subjected to a load of 40KN with length 2.5m and the poisson's ratio of 0.25. Determine the stress and strain in each member. Take E= 2 x 10^5 N/mm^2.	CO2	8 Marks

(OR)

2		Calculate the elongation of a copper bar of solid circular cross section with tapered ends when it is stretched by axial loads of magnitude 16kN (As shown in figure). The length of the end segments is 500mm and the length of the prismatic middle segment is 1250mm. The diameters at cross sections A, B, C and D are 12, 24, 24 and 12mm respectively and the modulus of elasticity is 120GPa.	CO3	14 Marks



UNIT-II

3		Draw the shear force and bending moment diagram for the beam shown in Fig. 1. Locate the point of contraflexure if any. Also find the point of maximum bending moment.	CO6	14 Marks

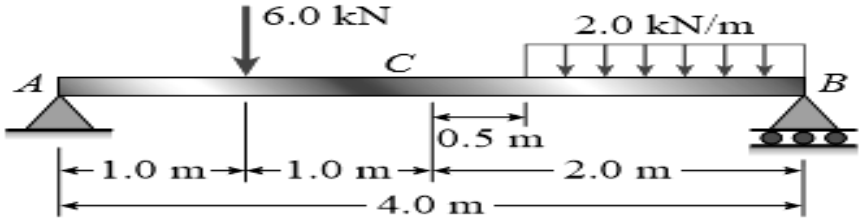


Fig. 1.

(OR)

4		A cantilever of length 6m carries two point loads of 2KN and 3KN at a distance of 1m and 6m from the fixed end respectively. It also carries a uniformly distributed load of 1KN/m over a length of 2m at a distance of 3m from the fixed end. In addition to that beam also carries a clockwise couple of 3KN-m at a distance of 4m from fixed end. Draw the shear force and bending moment diagram.	CO6	14 Marks

UNIT-III

5	a)	Derive torsion equation and define polar section modulus.	CO1	6 Marks
	b)	The steel axle of a large winch on an ocean liner is subjected to a torque of 1.65KN-m. What is the minimum required diameter $\mathbf{d_{min}}$, if the allowable shear stress is 48MPa and the allowable rate of twist is 0.75^0/m. Assume that the shear modulus of elasticity is 80 GPa.	CO2	8 Marks

(OR)

6		A Cast iron beam 20mm x 20mm in section and 100cm long is simply supported at the ends. It carries a point load W at the centre. The maximum stress induced is 120N/mm^2. What uniformly distributed load will break a cantilever of the same material 50mm wide, 100mm deep and 2m long.	CO3	14 Marks

UNIT-IV

7		Calculate the slope at ends and deflection at the middle of simply supported beam of span 'L' subjected to the following loads. i) When a concentrated load 'P' acts at the middle. ii) When a UDL of intensity 'w' per unit run act over entire span.	CO2	14 Marks

(OR)

8		A simply supported beam of 4m length and of uniform rectangular cross section 200mm wide and 350mm deep is loaded with a 50 KN load at its centre of beam. In addition to this it carries a uniformly distributed load of 30KN/m run over its entire length. Calculate i) Maximum slope and maximum deflection. ii) Slope and deflection at 3m from one end. Take E = 210GN/m^2.	CO4	14 Marks

UNIT-V

9		A cylindrical vessel whose ends are closed by means of rigid flange plates is made of steel plate 4mm thick. The length and internal diameter of the vessel are 100cm and 30cm respectively. Determine the longitudinal and hoop stresses in the cylindrical shell due to an internal fluid pressure of 2N/mm^2. Also calculate the increase in length, diameter and volume of the vessel. Take E = 2 x 10^5N/mm^2 and poisson's ratio of 0.3.	CO4	14 Marks

(OR)

10		Determine the maximum and minimum hoop stress across the section of a pipe of 400mm internal diameter and 100mm thick, when the pipe contains a fluid at a pressure of 8N/mm^2. Also sketch the radial pressure distribution and hoop stress distribution across the section.	CO5	14 Marks

CODE No.: 16BT30305 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC16) Supplementary Examinations February – 2021

THERMODYNAMICS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain in detail about Thermodynamic equilibrium.	CO1	6 Marks
	b)	Define Thermodynamic system and discuss different types of Thermodynamic systems with examples.	CO1	8 Marks
		(OR)		
2	a)	Define Thermodynamic definition of work and derive the expression for displacement work and state the conditions under which that equation is valid.	CO1	7 Marks
	b)	A gas undergoes a reversible-non flow process according to the relation P=(-3v+15) where v is the volume in m^3 and P is the pressure in bar. Determine the work done when the volume changes from 3 to $6m^3$.	CO2	7 Marks

UNIT-II

3	a)	State First law of thermodynamics applied to a closed system undergoing a cycle and for a process and deduce mathematical formulation for them.	CO1	7 Marks
	b)	A domestic refrigerator consumes 3.5 kWh of work during a period of its operation during which Its internal energy drops by 5500 kJ. Determine the direction and magnitude of heat interaction in the above period of operation.	CO2	7 Marks
		(OR)		
4	a)	State and prove that Kelvin Planck and Clausius statements are equivalent.	CO1	7 Marks
	b)	Air flows at the rate of 0.5kg/s through an air compressor entering at 7m/s velocity, 100kPa pressure and $0.95m^3/kg$ specific volume and leaving at 5m/s, 700kPa and $0.19m^3/kg$. The internal energy of the air leaving is 90kJ/kg greater than that of air entering. Cooling water in the compressor jacket absorbs heat from the air at the rate of 58 kW. i) Compute the rate of shaft work input to the air in Kw. ii) Find the ratio of inlet pipe diameter to the outlet pipe diameter.	CO3	7 Marks

UNIT-III

5	a)	Define Entropy and prove that Entropy is a property of a system.	CO4	7 Marks
	b)	$0.04m^3$ of nitrogen contained in a cylinder behind a piston is initially at 1.06 bar and 15C. The gas is compressed isothermally and reversibly until the pressure is 4.8 bar. Calculate: i) The change of entropy. ii) The heat flow. iii) The work done. Assume nitrogen to act as a perfect gas. Molecular weight of nitrogen=28.	CO4	7 Marks
		(OR)		
6	a)	Define Availability and Irreversibility.	CO4	4 Marks
	b)	A system at 500 K receives 7200 kJ/min from a source at 1000K. The temperature of atmosphere is 300K. Assuming that the temperature of system and source remains constant during heat transfer, find out: i) The entropy produced during heat transfer. ii) The decrease in available energy after heat transfer.	CO4	10 Marks

UNIT-IV

7	a)	Define the following terms as applied to pure substance steam. i) Sensible heat of water. (ii) Latent heat. iii) Dryness fraction of steam. (iv) Heat of superheat.	CO1	7 Marks
	b)	Find the internal energy and entropy of 1 kg of steam at 10 bar, when the condition of steam is: i) 0.85 dry. ii) Dry and saturated. iii) Superheated with degree of superheat being 50 C.	CO2	7 Marks

(OR)

8	a)	Derive an expression for entropy change of an ideal gas in different forms.	CO1	7 Marks
	b)	Show that for an ideal gas, the slope of the constant volume line on the T-s diagram is more than that of the constant pressure line.	CO4	7 Marks

UNIT-V

9	a)	Derive an expression for thermal efficiency of Diesel cycle.	CO4	7 Marks
	b)	An engine working on the Otto cycle has a clearance of 17% of stroke volume and initial pressure of 0.95 bar and temperature 30C. If the pressure at the end of the constant volume heating is 28 bar. Find: i) Air standard efficiency. ii) Maximum temperature in the cycle. iii) Ideal mean effective pressure.	CO5	7 Marks

(OR)

10	a)	Compare Otto, Diesel and Dual combustion cycles for the same compression ratio and heat rejected.	CO4	7 Marks
	b)	The swept volume of a diesel cycle engine working on dual cycle is $0.0053m^3$ and clearance volume is $0.00035m^3$. The maximum pressure is 65 bar. Fuel injection ends at 5 percent of the stroke. The temperature and pressure at the start of the compression are 80^0C and 0.9 bar. Determine the air standard efficiency of the cycle. Take $\gamma = 1.4$ for air.	CO5	7 Marks

❀ ❀ ❀

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations February – 2021

ELECTRONIC CIRCUIT ANALYSIS AND DESIGN

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

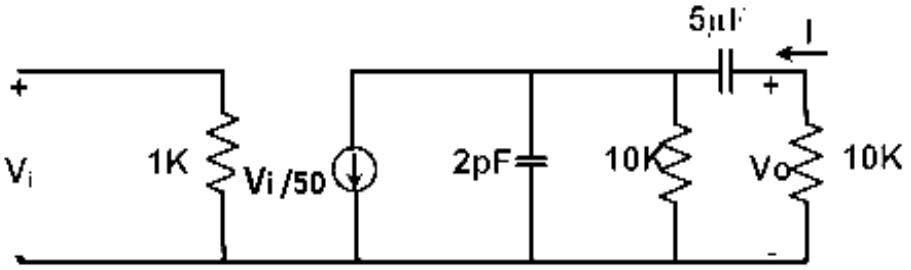
1	a)	Derive the voltage gain, current gain and input impedance expressions for CB amplifier using exact h-parameter model.	CO2	7 Marks
	b)	The h-parameters of the transistor used in CE amplifier are h_{fe} = 50, h_{ie}=1.1 KΩ, h_{re} = 2.5 x 10^{-4}, h_{oe} = 24 μA/V. Find out current gain and voltage gains with and without source resistance, input and output impedances, given that R_L= 10 KΩ and R_S= 1 KΩ.	CO4	7 Marks

(OR)

2	a)	What are the important characteristics of a cascade amplifier? Draw the circuit of CE-CC cascade amplifier and determine an expression for its voltage gain in terms of its circuit parameters.	CO2	7 Marks
	b)	With the help of a neat circuit diagram, analyze the working of a cascode amplifier	CO1	7 Marks

UNIT-II

3	a)	Derive the expression for the hybrid-π parameters $g_m, r_{b'e}, g_{ce}, r_{b'c}, r_{bb'}$ and diffusion capacitance.	CO2	8 Marks
	b)	An amplifier is represented by the following circuit shown, find the mid-band frequency gain. Lower and upper cutoff frequencies	CO4	6 Marks



(OR)

4	a)	Select one amplifier using FET which provides unity voltage gain and explain its behavior with necessary expressions.	CO5	6 Marks
	b)	Derive the expression for CE short circuit current gain and draw its frequency response.	CO2	8 Marks

UNIT-III

5	a)	Describe the following with respect to negative feedback i) Gain sensitivity. ii) Bandwidth extension. iii) Linearizing effect.	CO1	8 Marks
	b)	Apply current series feedback to the common emitter amplifier to increase the input resistance and output resistance.	CO6	6 Marks

(OR)

6	a)	Draw the circuit diagram of Colpitt's oscillator using BJT and derive the expression for frequency of oscillation.	CO2	6 Marks
	b)	Design the range of capacitor in a transistorized Hartley Oscillator the two inductances are 2mH and 20μH while the frequency is to be changed from 950 kHz to 2050 kHz.	CO3	4 Marks
	c)	Design the minimum value of h_{fe} in a transistor Colpitt's oscillator L=100μH, C_1=0.001μF, C_2=0.01μF for providing sustained oscillations.	CO3	4 Marks

UNIT-IV

7	a)	Design a class A power amplifier to obtain power efficiency of 50%	CO3	7 Marks
	b)	A single transistor is operating as an ideal class B amplifier with a 500 load. A **dc** meter in the collector circuit reads 10mA. How much signal power is delivered to the load?	CO4	7 Marks

(OR)

8	a)	What is Harmonic distortion in transistor amplifier circuits? Discuss second harmonic distortion.	CO1	7 Marks
	b)	Explain about heat sinks. Explain the term Thermal Resistance. Give the sketches of heat sinks.	CO1	7 Marks

UNIT-V

9	a)	The bandwidth for single tuned amplifier is 20kHz. Calculate the bandwidth if such three stages are cascaded. Also calculate for four stages.	CO4	4 Marks
	b)	The bandwidth for double tuned amplifier is 20kHz. Calculate the bandwidth if such three stages are cascaded.	CO4	3 Marks
	c)	Explain about Class-C tuned amplifier.	CO1	7 Marks

(OR)

10	a)	Apply your engineering skills to avoid the following problem in double tuned amplifier. "In double tuned amplifier alignment is difficult".	CO6	7 Marks
	b)	Select an appropriate tuned amplifier to obtain high overall gain and illustrate with an example.	CO5	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations February – 2021

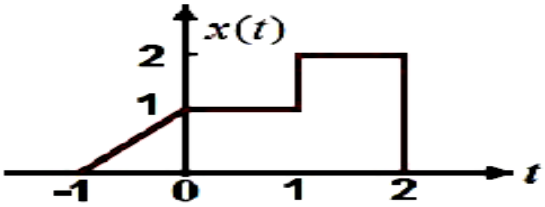
SIGNALS AND SYSTEMS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Illustrate the difference between analog, discrete and digital signals. Draw the graphical representation of : i) $u[-n-2]$. ii) $u[-n+2]$. iii) $u[n]-u[n-10]$.	CO2	7 Marks
	b)	Illustrate whether the following signals are periodic or aperiodic. If the signal is periodic find its fundamental period. i) $x(n) = 3\cos(10n + \pi/6)$ ii) $x(n) = e^{(j\pi n/2)}$.	CO4	7 Marks
		(OR)		
2	a)	A Continuous time signal is shown in figure. Sketch and label each of the following signals. i) $y_1(t) = x(t).\ u(1-t)$ ii) $y_2(t) = x(t)\ \{u(t) - u(t-1)\}$ 	CO2	7 Marks
	b)	Let $x(t) = e^{j2t}$ and $y(t) = e^{j\pi t}$, and consider their sum $z(t) = x(t) + y(t)$, and their product $w(t) = x(t)\,y(t)$. Determine if $z(t)$ and $w(t)$ are periodic, and if so, find their periods.	CO4	7 Marks

UNIT-II

3	a)	Find the Fourier Transform of the signal. $x(t) = x^1(t) * x^2(t)$ where, $x^1(t) = e^{-2t}\,u(t)$ and $x^2(t) = u(t)$.	CO4	7 Marks
	b)	State and prove any three properties of Fourier Series.	CO1	7 Marks
		(OR)		
4	a)	The given rectangular pulse is $x(t) = \begin{cases} 1, & \lvert t\rvert < T_1 \\ 0, & \lvert t\rvert > T_1 \end{cases}$. Find the Fourier transform.	CO3	7 Marks
	b)	What is an LTI system and Impulse response of a system? Explain briefly.	CO1	7 Marks

UNIT-III

5	a)	Differentiate convolution and correlation of signals with examples.	CO1	7 Marks
	b)	An excitation and impulse response of the system are given. Find the responses. $x(t) = u(t)$; $h(t) = 2u(t-1) - 2u(t-4)$	CO2	7 Marks
		(OR)		
6	a)	Explain Parseval's theorem and power density spectrum.	CO1	7 Marks
	b)	Discuss about detection of periodic signals in the presence of noise by correlation.	CO5	7 Marks

UNIT-IV

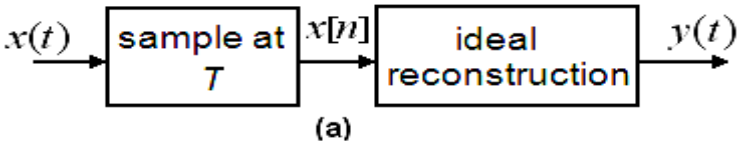
7	a)	A signal has Laplace transform $X(s) = \frac{s+2}{s^2+4s+5}$. Find Laplace transform $Y(s)$ of the signal $y(t) = tx(t)$.	CO4	7 Marks
	b)	For the following transform pair $L[x(t)] = \frac{2s}{s^2-2}$, determine the Laplace transform of $\boldsymbol{x(2t)}$.	CO4	7 Marks

(OR)

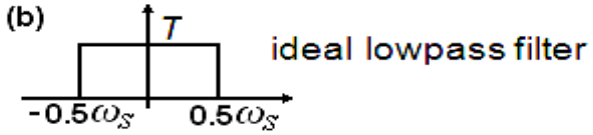
8	a)	Explain properties of ROC in Laplace transform.	CO1	7 Marks
	b)	Find the Laplace transform of $\boldsymbol{x(t) = t^2 e^{-2t} u(t)}$.	CO3	7 Marks

UNIT-V

9	a)	Consider the following sampling and reconstruction configuration: The output $y(t)$ of the ideal reconstruction can be found by sending the sampled signal $x_s(t) = x(t)p(t)$ through an ideal low pass filter shown in figure. Let $x(t) = 2 + \cos(50\pi t)$ and T = 0.01. Determine and sketch $\lvert X_s(\Omega)\rvert$ where $x_s(t) = x(t)p(t)$. Determine if aliasing occurs.	CO5	7 Marks



(a)



	b)	Build the concept of Sampling theorem with neat diagrams.	CO1	7 Marks

(OR)

10	a)	Find the z- transform of the following using ZT properties. i) $\boldsymbol{x[n]=n(1/3)^n u[n]}$ ii) $\boldsymbol{x[n] = (1/4)^{n+1} u[n-2]}$	CO4	7 Marks
	b)	Determine the inverse ZT of the sequence $X[z] = \frac{1-2z^{-1}}{1+\frac{1}{2}z^{-1}}$, if $x(n)$ is: i) Causal sequence. ii) Anti causal sequence.	CO4	7 Marks

❀ ❀ ❀

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations February – 2021

SWITCHING THEORY AND LOGIC DESIGN

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Each of the following arithmetic operations is correct in at least one number system. Determine the bases in each operation: i) 41 / 3 = 13. ii) . $\sqrt{41} = 5$	CO1	6 Marks
	b)	Given the following Boolean function: $F = xy'z + x'y'z + w'xy + wx'y + wxy$ i) Obtain the truth table of the function. ii) Draw the logic diagram using the original Boolean expression.	CO1	8 Marks

(OR)

2	a)	Verify that the following operations are commutative but not associative. i) NAND. ii) NOR.	CO1	6 Marks
	b)	Expand and simplify the expressions using De Morgan's theorem: i) $F(A,B,C) = (A+B)'(ABC)'(A'C)'$. ii) $F(A,B,C) = [(AB+B'C)+(BC'+A'B)]'$.	CO1	8 Marks

UNIT-II

3	a)	Simplify the following Boolean expression and implement with NAND gates F=Σ(0, 1, 2, 4, 5, 7, 11, 15).	CO1	6 Marks
	b)	Convert the given expressions into sum of products and product of sums: i) $(AB+C)B+C'D)$. ii) $x'+x(x+y')(y+z')$.	CO1	8 Marks

(OR)

4	a)	Simplify the following Boolean function using Tabulation method. $F(A, B, C, D) = \Sigma(1, 3, 4, 5, 10, 11, 12, 13, 14,15)$.	CO1	8 Marks
	b)	Find the minimum product-of-sums form for the following function and implement the function using NOR gates only: $F = \Sigma(4, 5, 8, 9, 12, 13) + d(0, 3, 7, 10, 11)$.	CO1	6 Marks

UNIT-III

5	a)	Design the 4-bit BCD adder and illustrate its operation.	CO2	7 Marks
	b)	A combinational circuit is defined by the following functions: $F_1 = x'y' + xyz'; F_2 = x' + y; F_3 = xy + x'y'$ Design the circuit with a decoder and external OR gates.	CO2	7 Marks

(OR)

6	a)	Show that a full-subtractor can be constructed with two half-subtractors and an OR gate.	CO2	7 Marks
	b)	Implement a full adder function using 4 x 1 multiplexers.	CO2	7 Marks

UNIT-IV

7	a)	Illustrate the operation of MSJK flip-flop using NAND gates.	CO2	6 Marks
	b)	Design a synchronous BCD counter with JK flip-flops.	CO5	8 Marks

(OR)

8 a) Reduce the number of states in the following state table and tabulate the reduced state table. CO2 7 Marks

Present State	Next State		Output	
	$x = 0$	$x = 1$	$x = 0$	$x = 1$
a	f	b	0	0
b	d	c	0	0
c	f	e	0	0
d	g	a	1	0
e	d	c	0	0
f	f	b	1	1
g	g	h	0	1
h	g	a	1	0

b) The contents of a serial-in/serial-out shift register are DCBA = 0101, where A is the least significant digit of the register. A serial input 10011 is moved into the shift register from left to right, most significant bit first by five successive clock pulses. Draw time diagrams showing how the outputs of the four flip-flops vary with time during the period of the five clock pulses. CO2 7 Marks

UNIT-V

9 a) Implement the following Boolean function using PAL: CO3 6 Marks

$F_1 = \Sigma m(0, 2, 5, 7, 8, 10, 12, 13)$

b) Design an Excess-3 to BCD code converter using PROM. CO3 8 Marks

(OR)

10 a) Design a BCD-to-seven segment decoder using PLA. CO3 7 Marks

b) Give the logic implementation of a 32 x 4 bit ROM using a decoder. CO3 7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC16) Supplementary Examinations February – 2021

ANALOG ELECTRONIC CIRCUITS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Derive the expressions for A_I, A_V, R_i, and R_o for common emitter amplifier with unbypassed R_E.	CO1	8 Marks
	b)	Draw the high frequency hybrid-π model for a CE transistor and indicate typical values of circuit parameters.	CO1	6 Marks
		(OR)		
2	a)	Compare the three types of coupling methods used in multistage amplifiers.	CO1	6 Marks
	b)	Given the following transistor measurements made at I_C = 5mA, V_{CE} = 10V and at room temperature h_{fe} = 100, h_{ie} = 600Ω, A_{ie} = 10 at 10MHz, Ce = 3pF. Find f_β, f_T, C_e, $r_{b'e}$ and $r_{bb'}$.	CO4	8 Marks

UNIT-II

3	a)	Draw the circuit diagram of current series feedback amplifier and derive the expressions for voltage gain, output impedance and input impedance.	CO3	8 Marks
	b)	An amplifier has an open loop gain of 1000 and a feedback ratio of 0.04. If the open loop gain changes by 10% due to temperature, find the percentage change in gain of the amplifier with feedback.	CO1	6 Marks
		(OR)		
4	a)	Classify various oscillators based on output waveforms, circuit components, operating frequencies and feedback sued.	CO1	8 Marks
	b)	In a RC phase shift oscillator, the feedback network uses R = 6KΩ and C = 1500pF. The transistorized amplifier used, has a collector resistance of 18KΩ. Calculate the frequency of oscillations and minimum value of h_{fe} of the transistor.	CO2	6 Marks

UNIT-III

5	a)	How the even harmonics in push pull amplifier are are eliminated. Using five point method, derive an expression for the total harmonic distortion.	CO2	8 Marks
	b)	A transistor used in audio frequency amplifier, working in class A operation supplies 0.8W to 4KΩ load. The zero signal d.c. collector current is 31mA and the DC collector current with signal is 36mA. Determine the second harmonic distortion.	CO4	6 Marks
		(OR)		
6	a)	With a neat diagram, explain the principle of operation of class B push pull amplifier and obtain the maximum value of overall efficiency.	CO1	6 Marks
	b)	Design a class-B push pull amplifier to deliver 20 Watts to a load of 16Ω. Given $V_{CC} = V_m$ = 40Volts.	CO3	8 Marks

UNIT-IV

7	a)	Explain how a sinusoidal waveform is converted into a square wave using clipper circuit.	CO1	6 Marks
	b)	Sketch the response of the RC high pass circuit excited by an exponential input and derive the expression for output.	CO2	8 Marks
		(OR)		

8	a)	Draw the circuit diagram for a negative and positive voltage clamping circuits. Sketch the input and output waveforms and explain the operation.	CO2	8 Marks
	b)	State and prove the Clamping circuit theorem.	CO1	6 Marks

UNIT-V

9	a)	The fixed biased binary uses npn silicon transistor with $h_{fe} = 20$. Assume that $V_{CE} = 12V$, $V_{bb} = 3V$, $R_c = 1K\Omega$, $R_1 = 10K\Omega$, $R_2 = 20K\Omega$. Find the stable state current and voltages of $V_{CE(sat)} = 0$ and $V_{be(sat)} = 0$.	CO2	8 Marks
	b)	With the help of neat diagram, discuss the different methods of triggering a binary.	CO1	6 Marks

(OR)

10	a)	Draw the circuit diagram of self biased transistor binary and analyze the design.	CO1	8 Marks
	b)	Find the period and output frequency of an astable multivibrator with $R_1 = R_2 = 25K\Omega$ and $C_1 = C_2 = 0.4\mu F$	CO2	6 Marks

CODE No.: 16BT30501 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations February – 2021

COMPUTER ORGANIZATION

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Draw and explain the diagram for 4-bit arithmetic circuit with four full adders circuits with 4-bit adders and four multiplexers for choosing different operations.	CO3	8 Marks
	b)	Show the step by step multiplication process using Both algorithm for given multiplicand (+15) and multiplier (-13).	CO4	6 Marks
		(OR)		
2	a)	Design a digital circuit that performs the four logic operations of Ex-OR, Ex-NOR, NOR and NAND. Use two selection variables. Show the logic diagram for one typical stage.	CO3	6 Marks
	b)	Draw and explain floating addition and subtraction flowchart.	CO1	8 Marks

UNIT-II

3	a)	With a neat diagram, explain the design of control unit with microprogram sequencer.	CO1	6 Marks
	b)	Write a program to evaluate the arithmetic statement X=(A*B) + (C*D) using three/two/one/zero address instructions.	CO5	8 Marks
		(OR)		
4	a)	Draw and explain the flowchart for instruction cycle.	CO1	6 Marks
	b)	List and explain various addressing modes with an example.	CO5	8 Marks

UNIT-III

5	a)	With the help of block diagram, explain the concept of DMA controller.	CO1	5 Marks
	b)	Discuss about the various modes of data transfer with practical example.	CO2	9 Marks
		(OR)		
6	a)	Distinguish between isolated I/O and memory mapped I/O with an example.	CO2	6 Marks
	b)	Demonstrate the role of IOP with neat diagram. Give the steps involved in CPU-IOP communication.	CO4	8 Marks

UNIT-IV

7	a)	Compare SRAM and DRAM in detail.	CO2	7 Marks
	b)	How many memory chips are needed to construct 2M*16 memory system using 512k*8 static memory chips?	CO3	7 Marks
		(OR)		
8	a)	Write short notes on magnetic disk and optical disks	CO6	8 Marks
	b)	How many 128*8 RAM chips are needed to provide a memory capacity of 2048? And how many lines of the address bus must be used to access 2048 bytes of memory? How many of these lines will be common to all chips? How many lines must be decoded for the line select?	CO3	6 Marks

UNIT-V

9	a)	Consider the multiplication of two 40*40 matrices using a vector processor. i) How many product terms are there in each inner product and how many inner products must be evaluated? ii) How many multiply-add operations are needed to calculate the product matrix?	CO6	8 Marks
	b)	Distinguish between Arithmetic pipe line and Instruction pipe line	CO2	6 Marks
		(OR)		
10	a)	Discus the various interconnection structures with neat sketch.	CO1	10 Marks
	b)	Explain the serial arbitration with neat sketch.	CO1	4 Marks

CODE No.: 16BT30502 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations February – 2021

DATA STRUCTURES

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Show how you identify the first and last node in the doubly circular linked list.	CO2	7 Marks
	b)	Write the advantages of using doubly linked list over singly linked list.	CO1	7 Marks
		(OR)		
2	a)	Explain and write a function to find the smallest and largest element of singly linked lists.	CO3	7 Marks
	b)	Construct an algorithm to perform polynomial addition.	CO4	7 Marks

UNIT-II

3		"Suppose we have a data representation for mapping two stacks into a one dimensional array, so that the elements of first stack are stored at odd index values and the elements of other stack are stored at even index values". Write an algorithm to add and delete elements from these stacks.	CO4	14 Marks
		(OR)		
4		Describe the linked implementation of queues with insertion, deletion operation.	CO1	14 Marks

UNIT-III

5		Compose in detail about AVL Tree and explain various rotations of AVL Trees maintaining balance factor while insertion and deletion takes place.	CO3	14 Marks
		(OR)		
6	a)	Explain the steps involved in converting the general tree to a binary tree with an example.	CO1	7 Marks
	b)	Write Explain algorithms for binary tree traversals.	CO1	7 Marks

UNIT-IV

7		Write about: i) Insertion. ii) Deletion operations in B-Trees.	CO2	14 Marks
		(OR)		
8		Explain in detail about the BFS with suitable example and write the BFS algorithm	CO1	14 Marks

UNIT-V

9		Construct step by step, how Merge sort sorts, for the following list of numbers {142, 543, 123, 65, 453, 879,572, 434} and explain in detail.	CO5	14 Marks
		(OR)		
10	a)	Define what is meant by collision resolution in Hashing.	CO1	7 Marks
	b)	Explain in detail any one strategy for dealing with it.	CO1	7 Marks

❀ ❀ ❀

CODE No.: 16BT30503 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations February – 2021

PYTHON PROGRAMMING

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What is Moor's law? Explain.	CO1	5 Marks
	b)	Write a Python program that prompts the user for two floating-point values and display the result of the first number divided by the second with exactly six decimal places displayed.	CO5	9 Marks
		(OR)		
2	a)	Discuss in detail about Python data types.	CO1	10 Marks
	b)	Write about literals in Python.	CO1	4 Marks

UNIT-II

3	a)	Write in detail about control statement in Python	CO2	9 Marks
	b)	Write a Python program to add up all the even numbers between 10 and 100 using while loop.	CO5	5 Marks
		(OR)		
4	a)	Discuss in detail about dictionaries in Python.	CO2	7 Marks
	b)	Write a program in Python to sort the names in a given list.	CO5	7 Marks

UNIT-III

5	a)	Write about passing of arguments to functions with example.	CO2	7 Marks
	b)	What is a text file? Explain the operations of text files in Python.	CO1	7 Marks
		(OR)		
6	a)	Write in detail about string methods in Python.	CO1	7 Marks
	b)	How do you handle exceptions in Python? Explain.	CO2	7 Marks

UNIT-IV

7	a)	Define encapsulation, inheritance and polymorphism with illustrations.	CO1	9 Marks
	b)	Give a set of instructions that gets the default turtle and sets it to an actual turtle shape.	CO4	5 Marks
		(OR)		
8	a)	Write in detail about pen attributes for turtle graphics.	CO1	6 Marks
	b)	Develop a simple program to create a polygon shape and create an interest design with it.	CO4	8 Marks

UNIT-V

9	a)	Briefly explain about tkinter structure.	CO1	7 Marks
	b)	Write in detail about adding buttons with suitable example.	CO2	7 Marks
		(OR)		
10	a)	With suitable example, explain about reusable GUI components with classes.	CO3	7 Marks
	b)	Write a Python script to develop a window by adding check buttons and radio buttons.	CO5	7 Marks

CODE No.: 16BT31002 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations February – 2021

SENSORS AND TRANSDUCERS

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

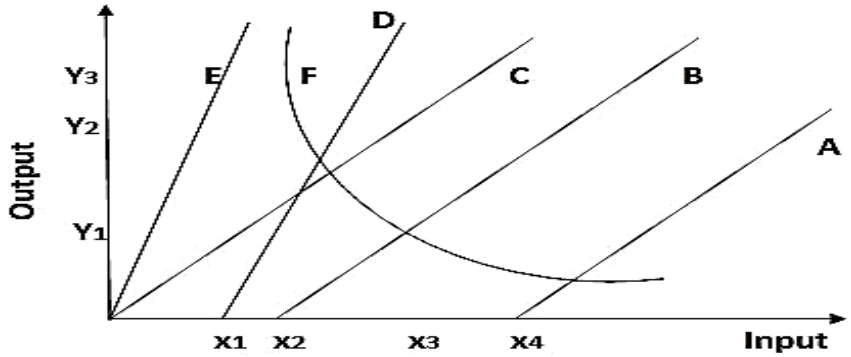
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Illustrate the different types of errors and discuss the causes of errors in measurement and how they can be minimized in detail.	CO6	8 Marks
	b)	Explain the significance of STANDARDS in measurements.	CO1	6 Marks
		(OR)		
2	a)	Why the calibration of instrument is necessary before measurement?	CO6	6 Marks
	b)	Select a suitable example for illustrating the generalized measurement system.	CO1	8 Marks

UNIT-II

3	a)	Classify various transducers and distinguish between active and passive type with any two examples.	CO2	8 Marks
	b)	Choose the best instrument among A, B, C, D, E, F. Comment on each instrument and justify the answer with valid reason.	CO4	6 Marks



(OR)

4	a)	List out any four dynamic characteristics of a measurement system and give their importance in the evaluation of the system.	CO1	7 Marks
	b)	List different types of standard inputs required in the validation process of a dynamic measurement system. Explain.	CO1	7 Marks

UNIT-III

5	a)	How can Resistive potensio meters be used for Linear and angular displacement measurements? Derive the expression for output.	CO3	8 Marks
	b)	Define the Gauge factor and classify the Strain gauges.	CO1	6 Marks
		(OR)		
6	a)	Explain the characteristic behavior of RTD and list out few applications.	CO1	7 Marks
	b)	"HOT WIRE Anemometers are well suitable for the Gas Flow Measurements". Justify mathematically with the neat sketch.	CO3	7 Marks

UNIT-IV

7	a)	Explain the construction and working principle of a LVDT as an inductive transducer. How to detect the magnitude and direction of the displacement of a core?	CO5	8 Marks
	b)	"LVDT " is a Passive Transducer-Justify. Explain the method of using LVDT for the Thickness measurements.	CO5	6 Marks
		(OR)		

8	a)	Differentiate Piezo electric and pyro electric effects and how they are used in various industrial applications.	CO4	7 Marks
	b)	List out the opto electronic transducers and explain any one circuitry operation along with the applications.	CO5	7 Marks

UNIT-V

9	a)	Differentiate Piezo electric and pyro electric effects and how they are used in various industrial applications.	CO3	7 Marks
	b)	List out the opto electronic transducers and explain any one circuitry operation along with the applications.	CO2	7 Marks

(OR)

10	a)	Define Micro Machining. Explain surface and bulk micro machining with neat sketch.	CO1	7 Marks
	b)	What is the function of Bio sensor and list out the biological parameters measured using Bio sensors.	CO1	7 Marks

CODE No.: 16BT31201 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations February – 2021

DISCRETE MATHEMATICAL STRUCTURES

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Show that: $P \vee (\sim P \wedge Q) \Leftrightarrow (P \vee Q)$.	CO1	7 Marks
	b)	Show that $S \vee R$ is tautologically implied by $(P \vee Q) \wedge (P \rightarrow R) \wedge (Q \rightarrow S)$.	CO2	7 Marks
		(OR)		
2	a)	State the converse, opposite and contrapositive for the implication: "If the triangle is equiangular, then it is equilateral"	CO1	7 Marks
	b)	Convert the following English statements to predicate logic notation: i) All Mokeys have tails. ii) No Mokey has a tail. iii) Some Monkeys have tails.	CO1	7 Marks

UNIT-II

3	a)	Show that if R, S are equivalence relations on set A the RUS need not be an equivalance relation	CO1	7 Marks
	b)	Let X={1, 2, 3, 6, 12, 18} and the relation | is x divides y. Draw the Hasse diagram of (X, |).	CO1	7 Marks
		(OR)		
4	a)	Show that the function $f(x) = x^2$ is not bijective function. Can we find its inverse?	CO1	7 Marks
	b)	Define Distributive Lattice. Check whether $(D_{20}, \|)$, where D_{20} is divisors of 20 and | represents the relation divides.	CO1	7 Marks

UNIT-III

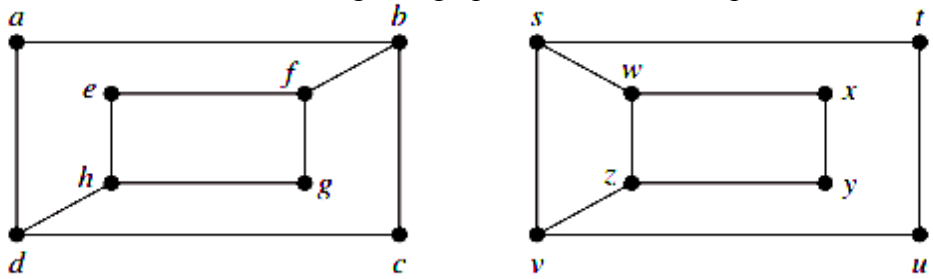
5	a)	Justify whether given set 'S'. S={0, 1, 2, 3, 4, 5} can be semigroup under binary operation $+_5$, i.e additive modulo 5.	CO5	7 Marks
	b)	Define Monoid and Group. Give an example of Monoid which is not an I group.	CO5	7 Marks
		(OR)		
6	a)	Show that in a group (G, .), if $(a.b)^2 = a^2 . b^2 \quad \forall a,b \in G$ then (G, .) is abelian.	CO5	7 Marks
	b)	State and Prove Lagranges theorem.	CO5	7 Marks

UNIT-IV

7	a)	Prove by using Mathematical Induction, $(x-y)$ divides $(x^n - y^n)$, $\forall n \geq 1$.	CO1	7 Marks
	b)	i) How many different license plates are there (allowing repetitions), that involve 1, 2 or 3 letters followed by 1, 2, 3 or 4 digits. ii) Involving 1, 2 or 3 letters and 1, 2, 3 or 4 digits if the letters must occur together.	CO5	7 Marks
		(OR)		
8	a)	Solve the Reccurence Relation $F_n = F_{n-1} + F_{n-2}$, $n \geq 2$ and $F_0 = F_1 = 1$.	CO1	7 Marks
	b)	Solve the Reccurence Relation $a_n - 6a_{n-1} + 8a_{n-2} = n.4^n$.	CO1	7 Marks

UNIT-V

9	a)	State and prove Euler formula on Planar graphs.	CO5	7 Marks
	b)	Check whether the following two graphs G, H are isomorphic.	CO4	7 Marks



G H

(OR)

10	a)	Write the algorithm for Breadth First Search. Explain with an example.	CO4	7 Marks
	b)	State Prims algorithm. Explain Prims algorithm with an example.	CO3	7 Marks

CODE No.: 16BT31501 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC16) Supplementary Examinations February – 2021

OPERATING SYSTEMS

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What is system call? Explain various types of system calls.	CO1	9 Marks
	b)	Describe the elements of process control block.	CO1	5 Marks

(OR)

2	a)	Discuss the simple operating system structure.	CO1	7 Marks
	b)	Explain about single threaded and multi-threaded process models with suitable diagram.	CO1	7 Marks

UNIT-II

3	a)	What is critical section? Discuss the solution of the critical section problem.	CO2	6 Marks
	b)	Consider the table given below for a system, Resource – 3 types A–(10); B–(5); C–(7) i) Find the need matrix and the safety sequence. ii) Is the request from process P1 (0, 1, 2) can be granted immediately	CO2	8 Marks

Process	Allocation			Maximum			Available		
	A	B	C	A	B	C	A	B	C
P0	0	1	0	7	5	3	3	3	2
P1	2	0	0	3	2	2			
P2	3	0	2	9	0	2			
P3	2	1	1	2	2	2			
P4	0	0	2	4	3	3			

(OR)

4	a)	Define Semaphore. Explain the usage and implementation of semaphores.	CO2	7 Marks
	b)	Explain how deadlocks are prevented.	CO2	7 Marks

UNIT-III

5	a)	What is paging? Discuss the paging model of logical and physical memory.	CO2	7 Marks
	b)	What is the cause of thrashing? How thrashing can be eliminated?	CO2	7 Marks

(OR)

6	a)	Describe the hardware requirements to support the segmentation.	CO2	7 Marks
	b)	Illustrate the page replacement algorithms i) LRU ii) Optimal page replacement. Use the reference string 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1 for a memory with three frames.	CO2	7 Marks

UNIT-IV

7	a)	Describe the file system Architecture with diagram.	CO3	7 Marks
	b)	Explain various disk scheduling algorithms with suitable diagrams.	CO4	7 Marks

(OR)

8	a)	Discuss about various File Access methods.	CO3	7 Marks
	b)	Explain about swap space management.	CO4	7 Marks

UNIT-V

9	a)	What are the advantages and disadvantages of supporting memory mapped I/O to device control registers.	CO5	7 Marks
	b)	Explain different schemes for protection.	CO5	7 Marks
		(OR)		
10	a)	Discuss the principles of Protection.	CO5	6 Marks
	b)	What are the similarities and differences between access-matrix facility and the role based access control facility?	CO5	8 Marks

CODE No.: 16BT41202 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations February – 2021

JAVA PROGRMMING

[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	List and explain the Java buzzwords.	CO1	8 Marks
	b)	How "for each" is different from "for" loop? Write a program to calculate average of given 10 numbers using "for each" loop.	CO2	6 Marks
		(OR)		
2	a)	Discuss various control structures available in Java.	CO1	8 Marks
	b)	Why "Java is called platform independent language"? Justify.	CO1	6 Marks
		UNIT-II		
3		What are the advantages of inheritance? Explain various types of inheritances with suitable examples.	CO1	14 Marks
		(OR)		
4	a)	What is an interface? Demonstrate how interfaces can be extended.	CO2	8 Marks
	b)	Discuss the uses of "final" keyword with suitable examples.	CO2	6 Marks
		UNIT-III		
5	a)	Explain the concept of exception handling with suitable example.	CO2	8 Marks
	b)	Write a program to demonstrate user defined exceptions in Java.	CO2	6 Marks
		(OR)		
6	a)	Explain thread synchronization with an example.	CO3	6 Marks
	b)	What is multithreading? How we create multiple threads in Java?	CO3	8 Marks
		UNIT-IV		
7	a)	Discuss PriorityQueue class in Java.	CO4	6 Marks
	b)	Discuss briefly Java AWT controls.	CO4	8 Marks
		(OR)		
8	a)	Define an applet. Explain applet life cycle methods with the help of an example program.	CO4	6 Marks
	b)	Define an Event and explain its role in AWT event handling.	CO4	8 Marks
		UNIT-V		
9	a)	What is the role of event listeners in event handling? List the Java event listeners with suitable example.	CO5	8 Marks
	b)	Discuss briefly adapter classes in Java.	CO5	6 Marks
		(OR)		
10	a)	Write a program to display current web server date and time using GenericServlet with detailed deployment steps.	CO6	8 Marks
	b)	Explain Http Servlet Life–Cycle with neat sketch.	CO6	6 Marks

❀ ❀ ❀

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations February - 2021

LINUX PROGRAMMING

[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Describe the list of the programming languages available for Linux system.	CO1	7 Marks
	b)	Write a simple Linux program to enter the details of the student and display them.	CO3	7 Marks
		(OR)		
2	a)	Describe the characteristics of Unix programs and systems.	CO1	8 Marks
	b)	Write a short notes on the following: i) Text Editors. ii) The C Compiler.	CO1	6 Marks

UNIT-II

3	a)	Illustrate how inputs and outputs of Linux programs can be redirected.	CO5	7 Marks
	b)	Two numbers are entered through the keyboard. Write a shell script to find the value of one number raised to the power of another.	CO3	7 Marks
		(OR)		
4	a)	What is meant by Shell? Describe in detail the Shell environment with a neat sketch.	CO1	7 Marks
	b)	Write a shell script which gets executed the moment the user logs in. It should display the message “good morning”, “good afternoon”, “good evening” based on the time of login.	CO5	7 Marks

UNIT-III

5	a)	Analyze various systems calls for managing the files.	CO2	7 Marks
	b)	Discuss in detail various commands related to the directories with an examples.	CO1	7 Marks
		(OR)		
6	a)	Explain the following Standard I/O library commands: i) fopen. ii) fwrite. iii) fseek. iv) puts.	CO2	8 Marks
	b)	Write a shell script that accepts a file name, starting and ending line numbers as arguments and displays all the lines between the given line numbers.	CO4	6 Marks

UNIT-IV

7	a)	Illustrate the working principle of parent process and child process using fork system call.	CO6	7 Marks
	b)	Define signal and mention the different types of signal sources, illustrate the catching of signal with example.	CO1	7 Marks
		(OR)		
8	a)	Demonstrate the need for Zombie process with an example.	CO1	6 Marks
	b)	Write a program that accepts two small numbers as arguments and then sums the two in a child process. The sum should be returned by the child to the parent as its exit status and the parent should print the sum.	CO5	8 Marks

UNIT-V

9	a)	Define socket. Illustrate socket attributes and the process of creating a socket.	CO1	7 Marks
	b)	Does the FIFO pipe overcome the limitations of normal pipe? Justify your answer.	CO6	7 Marks

(OR)

10	a)	Define pipe. Create a named pipe using mknod with an example	CO4	6 Marks
	b)	Develop a C program to setup a two-way pipe between parent and child processes so that both can send and receive signals.	CO6	8 Marks

CODE No.: 16BT3BS01 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

PROBABILITY DISTRIBUTIONS AND STATISTICAL METHODS

[Civil Engineering; Mechanical Engineering, Computer Science and Engineering; Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) A fair coin is tossed until a head or five tails occurs. Calculate the expected number of tosses of the coin? CO4 7 Marks

b) For the continuous probability function $f(x) = k\,x^2\,e^{-x}$ when $x \geq 0$. Determine (i) k. (ii) Mean of *X*. (iii) Variance of *X*. CO4 7 Marks

(OR)

2 a) For the following probability distribution CO4 7 Marks

X=x	*-3*	*6*	*9*
P(X=x)	*1/6*	*1/2*	*1/3*

Find (i) $E(X)$. (ii) $E(x^2)$. (iii) $E[2x+1)^2]$.

b) If X is a continuous random variable with p.d.f CO4 7 Marks

$$f(x) = \begin{cases} x^2, 0 \leq x \leq 1 \\ 0, \text{ elsewhere} \end{cases}$$

If $P(a \leq x \leq 1) = \frac{19}{81}$, estimate the value of '*a*'.

UNIT-II

3 a) In a large consignment of electric bulbs 10% are defective. A random sample of 20 is taken for inspection. Determine the probability that CO4 6 Marks

i) All are good bulbs.
ii) Almost there are three defective bulbs.
iii) Exactly there are three defective bulbs.

b) If X is normally distributed with mean 6 and S.D 2; CO4 8 Marks

Determine i) $P(0 < X < 12)$. ii) $P(X < 10)$. iii) $p(X \geq 10)$.

(OR)

4 a) In a binomial distribution consisting of 5 independent trials, probabilities of getting 1 and 2 successes are 0.4096 and 0.2048 respectively. Calculate the parameter 'p' of the distribution. CO4 7 Marks

b) Design a Poisson distribution function satisfying the data and also find the expected frequencies: CO3 7 Marks

X	0	1	2	3	4
f	109	65	22	3	1

UNIT-III

5 Price indices of cotton and wool are given below for the 12 months of a year. Write the equations of lines of regression between the indices CO4 14 Marks

X	78	77	85	88	87	82	81	77	76	83	97	93
Y	84	82	82	85	89	90	88	92	83	89	98	99

(OR)

6 a) During an examination of equal length of 10 cloths the following are the number of defects observed. 2, 3, 4, 0, 5, 6, 7, 4, 3, 2. Design a control chart for the number of defects and comment whether the process is under control or not. CO3 8 Marks

b) Define regression lines and regression coefficients. Write the relationship between correlation coefficient and regression coefficients. CO1 6 Marks

UNIT-IV

7 a) In a random sample of 100 packages shipped by air freight 13 had some damage. Construct 95% confidence interval for the true proportion of damage package. CO2 7 Marks

b) In a city A, 20% of a random sample of 900 school boys has a certain slight physical defect. In another city B, 18.5% of a random sample of 1600 school boys had the same defect. Analyze the difference between the proportions is significant at 0.05 level of significance or not. CO2 7 Marks

(OR)

8 a) From the following data on performance of two machines, test whether the means differ significantly from each by taking at 95% level of confidence. CO4 7 Marks

Machine-A : n = 50, mean = 21, SD=5

Machine -B: n = 60, mean = 22, SD=4.

b) In a big city 325 men out of 600 were found to be smokers. Does this information support the conclusion that the majority of the men in this city are smokers? Analyze the given information and conclude. CO2 7 Marks

UNIT-V

9 a) A machinist is expected to make engine parts with axle diameter of 1.75cm. A random sample of 10 parts shows a mean diameter 1.85cm with a S.D of 0.1 cm. on the basis of this sample, Examine that the work of the machinist is inferior or superior and justify your answer. CO2 7 Marks

b) In an investigation on the machine performance, the following results were obtained: CO4 7 Marks

	No. of units inspected	No. of defectives
Machine 1	375	17
Machine 2	450	22

Test whether there is any significance of two machines at $\alpha = 0.05$

(OR)

10 a) The average breaking strength of the steel rods is specified to be 18.5 thousand pounds. A sample of 14 rods was tested. The mean and standard deviation obtained were 17.85 and 1.955 respectively. Analyse whether the experiment is significant or not. Justify your answer. CO2 7 Marks

b) The time taken by workers in performing a job by method I and method II is given below: CO5 7 Marks

Method I	20	16	26	27	23	22	-
Method II	27	33	42	35	32	34	38

Using appropriate statistical technique analyse the data show that the variances of time distribution from population from which these samples are drawn do not differ significantly.

❀ ❀ ❀

CODE No.: 16BT3BS02 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

SPECIAL FUNCTIONS AND COMPLEX ANALYSIS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Express $\int_0^{\frac{\pi}{2}} \sqrt{\cot\theta}\, d\theta$ in terms of gamma function. CO1 CO4 7 Marks

b) Compute (i) $\beta(\frac{3}{2},\frac{1}{2})$ and (ii) $\Gamma(4.5)\,\Gamma(3.5)$. CO4 7 Marks

(OR)

2 a) Derive the relation $\frac{d}{dx}\left[x^n J_n(x)\right] = x^n J_{n-1}(x)$. CO4 7 Marks

b) Prove that $\int J_3(x)\,dx = c - J_2(x) - \frac{2}{x}J_1(x)$. CO4 7 Marks

UNIT-II

3 Test the continuity and Cauchy-Riemann equations at the origin of the function defined by $f(z) = \begin{cases} \frac{x^3(1+i) - y^3(1-i)}{x^2+y^2}, & z \neq 0, \\ 0, & z = 0. \end{cases}$ Also find $f'(0)$, if it exists. CO1 CO4 14 Marks

(OR)

4 a) Show that $U = \frac{1}{2}\log(x^2+y^2)$ harmonic and find its conjugate. CO1 7 Marks

b) In an electric field, the potential function is $\log(x^2+y^2)$, find the flux function and the complex potential function. CO4 7 Marks

UNIT-III

5 a) *Evaluate* $\int_C \frac{\sin^2 z}{(z-\pi/6)^3}dz$, where C is the circle |z|=1.5, using Cauchy's integral formula. CO4 7 Marks

b) Compute $\oint_C \mathrm{Re}\, z^2\, dz$ counterclockwise around the boundary of the square with vertices 0, i, 1+i, 1. CO3 7 Marks

(OR)

6 a) Expand $f(z) = \frac{1}{z^2(z-i)}$ as a Laurent's series about 'i' and hence determine the residue thereat. CO3 7 Marks

b) Integrate counterclockwise around the unit circle $\oint_C \frac{e^z \cos z}{(z-\frac{\pi}{4})^3}dz$. CO2 CO3 7 Marks

UNIT-IV

7	a)	Apply the calculus of residues, evaluate $\int_0^{2\pi} \frac{d\theta}{(5+4\cos\theta)}$.	CO1 CO4	7 Marks
	b)	Define the removable singularity, pole, essential singularity with examples.	CO5	7 Marks

(OR)

8		Find the residue of $f(z) = \frac{z^3}{(z-1)^4(z-2)(z-3)}dz$ at its poles and hence evaluate $\oint_C f(z)dz$, where C is the circle $\|z\| = 2.5$.	CO4	14 Marks

UNIT-V

9	a)	Show that the bilinear transformation $w = (2z+3)/(z-4)$ maps the circle $x^2 + y^2 - 4x = 0$ into the line $4u + 3 = 0$.	CO4	7 Marks
	b)	Obtain the bilinear transformation which maps the points z= ∞, i,0 into the points w = 0, i, ∞ respectively.	CO4	7 Marks

(OR)

10	a)	Determine the region of the w-plane into which the following regions are mapped by the transformation $w = z^2$: (i) first quadrant of Z-plane (ii) region bounded by $x = 1$, $y = 1$, $x + y = 1$.	CO4	7 Marks
	b)	Determine the fixed points of the transformation w= (5z+4)/ (z+5). Is the transformation parabolic? Justify.	CO4	7 Marks

CODE No.:16BT30102 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations January – 2022

FLUID MECHANICS AND HYDRAULIC MACHINERY
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Describe any five significant properties of fluids.	CO1	7 Marks
	b)	A flat plate weighing 0.45 kN has a surface area 0.1 m^2. It slides down an inclined place at 30^0 to the horizontal, at a constant speed of 3 m/sec. If the inclined plane is lubricated with an oil of viscosity 0.1 N-S/m^2, find the thickness of the oil film.	CO2	7 Marks

(OR)

2	a)	Derive an equation for hydrostatic force and centre of pressure for a vertically immersed plane surface.	CO2	7 Marks
	b)	A metallic body is floating at the interface of mercury & water such that 40% of its volume is submerged in mercury and 60% in water. Determine specific gravity of a metallic body.	CO2	7 Marks

UNIT-II

	a)	Derive the continuity equation in three dimensions for steady incompressible fluid flow.	CO1	7 Marks
	b)	Define stream function and velocity potential. Show that following stream function $\psi = 6x - 4y + 7xy + 9$ represents an irrotational flow.	CO2	7 Marks

(OR)

4	a)	Define the Bernoulli's theorem and derive Bernoulli's equation by mentioning the assumptions made.	CO1	7 Marks
	b)	A 45^0 reducing bend is connected in a pipe line, the diameters at the inlet and outlet of the bend being 600 mm and 300 mm respectively, find the force exerted by water on the bend if the intensity of pressure at inlet to bend is 8.829 N/cm^2 and rate of flow of water is 600 liters/sec.	CO2	7 Marks

UNIT-III

5	a)	Explain the terms: i) Pipes in series. ii) Pipes in parallel. iii) Branching pipes.	CO1	7 Marks
	b)	Using Buckingham's theorem, show that the frictional torque 'T' of a disc of diameter 'D' rotating at a speed 'N' in a fluid of viscosity 'μ' and density 'ρ' in a turbulent flow is given by, $T = D^5N^2\rho\ \phi\ [\mu / D^2N\rho]$	CO4	7 Marks

(OR)

6	a)	What are the different laws on which models are designed for dynamic similarity? Where are they used?	CO4	7 Marks
	b)	A horizontal pipe line 40m long is connected to a water tank at one end and discharges freely into the atmosphere at the other end. For the first 25m of its length from the tank, the pipe is 15cm dia., and its dia. is suddenly enlarged to 30cm. The height of water in the tank is 8m above the centre of the pipe. Considering all losses of head which occur. Determine the rate of flow. Take f = 0.04 for both the section of the pipe and draw the HGL and TEL.	CO3	7 Marks

UNIT-IV

7	a)	Show that the length of the sloping side is equal to half of the top width for a most economical trapezoidal channel section.	CO5	7 Marks
	b)	Design a concrete lined channel to carry a discharge of 500 cumecs at a slope of 1 in 4000. The side slopes of the channel may be taken as 1:1. The manning's roughness coefficient for the lining is 0.014. Assume permissible velocity in the section as 2.5 m/s.	CO5	7 Marks

(OR)

8	a)	State and derive the dynamic equation for Gradually Varied Flow.	CO5	7 Marks
	b)	The depth of flow of water at a certain section of a rectangular channel of 2.0m wide is 0.3m. The discharge through the channel is 1.5m^3/s. Determine whether a hydraulic jump will occur, if so, find its height and loss of energy due to hydraulic jump.	CO5	7 Marks

UNIT-V

9	a)	Explain the principle and working of a Centrifugal Pump with a neat sketch.	CO3	7 Marks
	b)	A double jet Pelton turbine has a specific speed of 14 and is required to deliver 1000 kW. The water is supplied through a pipeline from a reservoir whose level is 400m above the nozzle. Assume 5% H for friction loss in the pipe, calculate, i) Speed in r.p.m., ii) Diameter of jet and iii) Mean diameter of bucket circle. Take Cv = 0.98; φ = 0.46; η_o = 85%.	CO3	7 Marks

(OR)

10	a)	Discuss the classification of turbines with examples.	CO1	7 Marks
	b)	A three stage Centrifugal pump has impellers 40 cm in diameter and 2 cm wide at outlet. The vanes are curved back at the outlet at 45^0 and reduce the circumferential area by 10%. The Manometric efficiency is 90% and the Overall efficiency is 80%, determine the head generated by the pump, when running at 1000 r.p.m., delivering 50 lt/sec. What should be the S.H.P.?	CO3	7 Marks

CODE No.:16BT30103 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations January – 2022

MECHANICS OF SOLIDS

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Derive the relation between modulus of elasticity, modulus of rigidity and Bulk modulus.	CO1	14 Marks
		(OR)		
2		A rod is 2m long at a temperature of 10^0C. Find the expansion of the rod, when the temperature is raised to 80^0C. If the expansion is prevented, find the stress induced in the material of the rod. Take E= 2.1 x 10^5N/mm² and α=0.000012 per degree centigrade.	CO2	14 Marks

UNIT-II

3	a)	Explain briefly about the types of : (i) Supports. (ii) Beams. (iii) Loads. (iv) Concept of shear force and bending moment.	CO2	7 Marks
	b)	A cantilever of length 2m carries a uniformly distributed load of 2kN/m length over the whole length and a point load of 3k at the free end. Draw the shear force and bending moment diagrams for the cantilever.	CO2	7 Marks
		(OR)		
4		A beam ABC 11m long is simply supported at A and B and has an overhang BC of 3m. It is loaded with U.D.L. of 4kN/m over the whole length. A concentrated load of 30kN is acting at 6m from A. calculate the reactions. Find the position and value of maximum bending moment and plot the bending moment and shear force diagrams.	CO2	14 Marks

UNIT-III

5		A cantilever of symmetrical I-section of flanges 30mm x 2.5mm and web of 45mm x 2mm, 2.5m long is subjected to a load of 250N at the free end. The load is acting 20^0 to the vertical axis. Determine the resulting bending stress at the top left and top right corners, on the fixed section of the cantilever.	CO4	14 Marks
		(OR)		
6		Prove that the maximum shear stress in a circular section of a beam is 4/3 times the average shear stress.	CO4	14 Marks

UNIT-IV

7	a)	Derive an equation for the deflection of a closely coiled helical spring.	CO3	6 Marks
	b)	Find the maximum permissible axial load for a closely coiled helical spring made out of 10mm square rod with 16 coils of 12cm mean diameter if the maximum shear stress is limited to 300N/mm², calculate also the deflection under load if N=0.84 x 10^5N/mm².	CO4	8 Marks
		(OR)		
8		A close-coiled helical spring is made out 10mm diameter steel rod. The coil consists of 10 complete turns with a mean diameter of 120mm. the spring carries an axial full of 200N. Find the maximum shear stress induced in the section of the rod. If C=80GN/m², find the deflection in the spring, the stiffness and strain energy stored in the spring.	CO5	14 Marks

UNIT-V

9	The internal and external radii of a thick cylinder are 200mm and 300mm respectively. The external pressure on the cylinder is 4N/mm². Find the internal pressure that can be applied if the maximum hoop stress is limited to 15N/mm². Sketch also the distribution of radial pressure and hoop stress across the wall section.	CO6	14 Marks
	(OR)		
10	Find the thickness of metal necessary for a steel cylindrical shell of internal diameter 150mm to withstand an internal pressure of 50N/mm². The maximum hoop stress in the section is not to exceed 150N/mm².	CO6	14 Marks

❀ ❀ ❀

CODE No.:16BT30201 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations January – 2022

DC MACHINES
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain in detail the constructional features of a DC machine.	CO1	8 Marks
	b)	An 8–pole DC shunt generator with 778 wave connected armature conductors and running at 500 r.p.m supplies a load of 12.5Ω resistance at a terminal voltage of 250V.The armature resistance is 0.24Ω and the field resistance is 250Ω. Find the armature current, induced **emf**, flux per pole.	CO4	6 Marks
		(OR)		
2	a)	Explain the principle and operation of DC generator.	CO1	7 Marks
	b)	A shunt generator has a full load current of 196A at 220V. The stray losses are 720W and the shunt field coil resistance is 55Ω. If it has a full load efficiency 88%. Find the armature resistance, current corresponding to the maximum efficiency.	CO4	7 Marks

UNIT-II

3	a)	Briefly explain the concept of interpoles and compensating winding in a DC machine.	CO2	7 Marks
	b)	An 8–pole lap connected DC shunt generator delivers an output of 240A at 500V. The armature has 1408 conductors and 160 commutator segments. If the brushes are given a lead of 4 segments from no load neutral axis, estimate the cross magnetising AT/pole and demagnetising AT/pole.	CO4	7 Marks
		(OR)		
4		Explain the process of commutation, factors effecting ideal commutation; also derive the expression for reactance voltage.	CO1	14 Marks

UNIT-III

5	a)	Briefly explain the internal and external characteristics of DC shunt generator.	CO1	6 Marks
	b)	Two DC shunt generators with **emf's** of 120V, 115V, R_{a1}=0.05Ω and R_{a2}= 0.04Ω, R_{sh1}= 20Ω, R_{sh2}= 25Ω respectively are in parallel supplying a load of 25kW. How do they share a total load?	CO4	8 Marks
		(OR)		
6	a)	Explain the process of parallel operation of two shunt generators.	CO1	7 Marks
	b)	Explain the internal and external characteristics of DC compound generator.	CO1	7 Marks

UNIT-IV

7	a)	With a neat sketch, explain the operation of 3-point starter.	CO3	7 Marks
	b)	Explain the various method of speed control of DC series motors, analyse which method is having better control.	CO5	7 Marks
		(OR)		

8	a)	A 220V DC shunt motor runs at 760 r.p.m and takes a current of 48A. Find the resistance to be added to the field circuit to increase speed to 950 r.p.m and an armature current of 78A. Assume flux is proportional to field current. R_a=0.15Ω, R_{sh}= 240Ω respectively.	CO4	7 Marks
	b)	Explain the principle and operation of DC motor.	CO1	7 Marks

UNIT-V

9	a)	Explain the process of indirect method of testing of a DC shunt machine.	CO1	7 Marks
	b)	Shunt machines loaded for the Hopkinson's test take 15A at 200V from the supply. The motor armature Current is 100A and the shunt currents are 3A and 2.5A. If the armature resistance of each machine is 0.05Ω, calculate the efficiency of each machine for this load condition.	CO4	7 Marks

(OR)

10	a)	Explain the direct method of testing of DC machine; write its advantages and disadvantages.	CO1	7 Marks
	b)	Explain the Hopkinson's method of testing of DC machine.	CO1	7 Marks

CODE No.:16BT30202 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations January – 2022

ELECTROMAGNETIC FIELDS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	A straight line extending along z axis in a cylindrical coordinate system from $-\infty$ *to* ∞. Using Gauss's law, calculate the electric field intensity **E** at any and every point resulting from a uniform line charge density ρ_L.	CO4	7 Marks
	b)	Calculate the work done in moving a 4-C charge from B(1, 0, 0) to A(0, 2, 0) along the path y= $2-2x, z=0$ in the field E= $5x\mathbf{a}_x + 5y\mathbf{a}_y$ V/m.	CO3	7 Marks

(OR)

2	a)	A total charge of 40/3 nC is uniformly distributed in the form of circular disk of radius 2m. Find the potential due to this charge at a point on the axis, 2m from the disc. Compare this potential with that result if all of the charge is at the center of the disk.	CO4	7 Marks
	b)	Find the force on a point charge of 50μC at (0, 0, 5)m due to a charge of 500π μC that is uniformly distributed over the circular disk r $\leq$ 5m, z = 0m.	CO4	7 Marks

UNIT-II

3	a)	Derive an expression for energy density in electrostatic field.	CO1	6 Marks
	b)	Obtain an expression for the field and potential due to a small electric dipole oriented along z-axis.	CO4	8 Marks

(OR)

4	a)	Derive an expression for capacitance of a parallel plate capacitor.	CO1	6 Marks
	b)	Two extensive homogeneous isotropic dielectrics meet on plane z = 0. For z>0, ε_{r1}=4 and for z<0, ε_{r2}=3. A uniform electric field $\mathbf{E}_1$=5$\mathbf{a}_x$-2$\mathbf{a}_y$+3$\mathbf{a}_z$ kV/m exists for z≥0. Find: i) $\mathbf{E}_2$ for z≤0 ii) the angles E_1 and E_2 make with interface.	CO1	8 Marks

UNIT-III

5	a)	State Biot-Savart's law and write down the expressions for magnetic field due to various types of current distributions.	CO1	7 Marks
	b)	A circular loop located on $x^2+y^2=9$, z=0 carries direct current of 10A along $\mathbf{a}_\phi$. Determine **H** at (0, 0, 4) and (0, 0, -4).	CO1	7 Marks

(OR)

6	a)	Find the flux crossing the portion of the plane $\phi=\pi/4$ define by 0.01<r<0.05m and 0<z<2m. A current filament of 2.5A along the z-axis is in the $\mathbf{a}_z$ direction.	CO3	8 Marks
	b)	Explain nonexistence of magnetic monopole. Compare with divergence of **D**.	CO2	6 Marks

UNIT-IV

7	a)	Find the force on the particle of mass $1.7*10^{-27}$ kg and charge $1.6*10^{-19}$ C if it enters a field **B**=5mT with an initial speed of 83.5 km/s. assume $\mathbf{U}_0$and **B** are perpendicular.	CO4	7 Marks
	b)	Derive an expression for torque on a current loop in a magnetic field.	CO1	7 Marks

(OR)

8	a)	What are magnetic boundary conditions? Derive them at interface between two different magnetic materials with neat sketch.	CO1	7 Marks
	b)	Derive an expression for self-inductance of a toroidal coil of N turns and current I.	CO3	7 Marks

UNIT-V

9	a)	Give the importance of displacement current while resolving the inconsistency of Ampere's circuit law for time varying fields.	CO2	7 Marks
	b)	A 30cm by 40cm rectangular loop rotates at 130 rad/s in a magnetic field 0.06Wb/m^2 normal to the axis of rotation. If the loop has 50 turns, determine the induced voltage in the loop.	CO3	7 Marks

(OR)

10	a)	Derive Poynting theorem and Poynting vector.	CO5	8 Marks
	b)	State and explain in detail Faraday's law and Lenz's law.	CO2	6 Marks

CODE No.:16BT30203 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations January – 2022

SIGNALS, SYSTEMS AND NETWORKS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

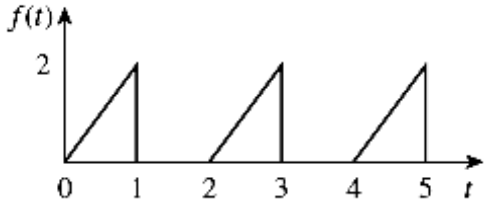
1	a)	Determine whether the given system $y(t) = \sin(5t)x(t)$ is: i) Causal. ii) Time Invariant. iii) Linear.	CO1	7 Marks
	b)	Test whether the following signals are energy signals, power signal or neither i) $x(t) = e^{-at}u(t)$. ii) $x(t) = t\ u(t)$.	CO2	7 Marks

(OR)

2	a)	Show that if the two signals $f_1(t)$ and $f_2(t)$ are orthogonal over an interval t_1 and t_2, then energy of the signal [$f_1(t) + f_2(t)$] is equal to the sum of energies of $f_1(t)$ and $f_2(t)$.	CO4	7 Marks
	b)	Differentiate clearly even and odd signals.	CO2	7 Marks

UNIT-II

3	a)	Calculate the Laplace transform of periodic function.	CO2	7 Marks



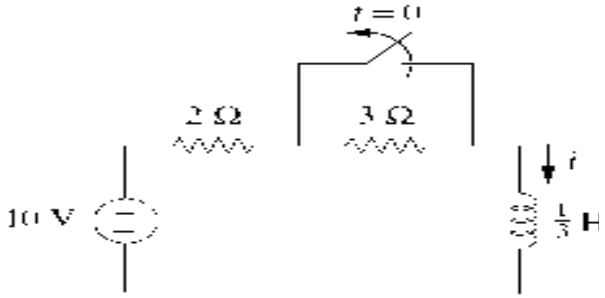
	b)	Compare between Fourier transform and Laplace transform.	CO2	7 Marks

(OR)

4	a)	Find the Fourier transforms of the following function. (i) signum function. (ii) the sinc function sin(t)/t.	CO5	7 Marks
	b)	Calculate the inverse Laplace transform of (i) $\frac{6(s-1)}{s^4-1}$ (ii) $\frac{se^{-\pi s}}{s^2+1}$.	CO5	7 Marks

UNIT-III

5	a)	Find i(t) in the circuit shown for t>0 .Assuming that switch has been closed for long time	CO5	7 Marks

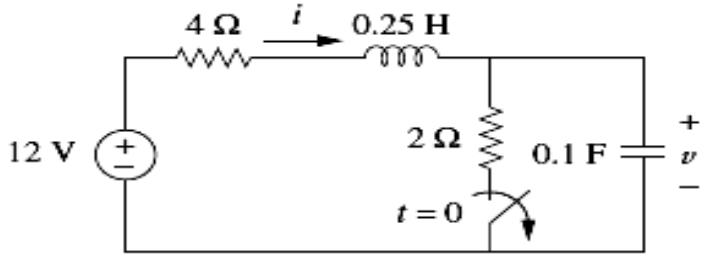


	b)	Derive the expression for the transient response of series R-L-C circuit driven by unit step function.	CO2	7 Marks

(OR)

6 The switch in Figure has been closed for a long time. It is open at t=0. CO4 CO2 14 Marks

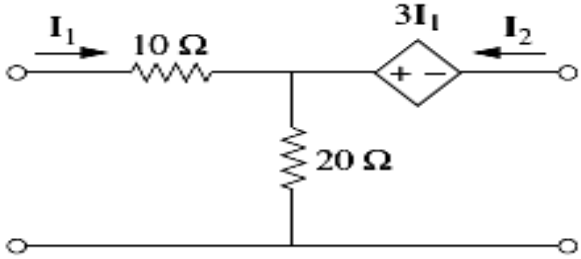
Find $(i)\ i(0^+), v(0^+)$. (ii) $\frac{di(0^+)}{dt}, \frac{dv(0^+)}{dt}$. (iii) $i(\infty), v(\infty)$.



UNIT-IV

7 a) Convert the ABCD parameter into h parameters. CO4 7 Marks

b) Find the transmission parameters of the given two port network CO1 7 Marks

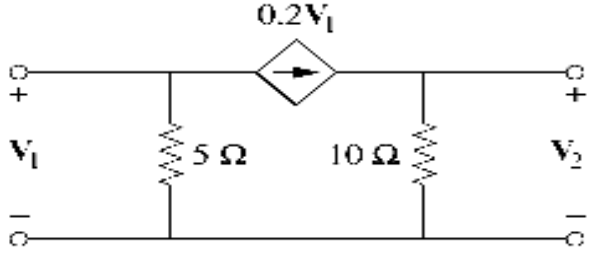


(OR)

8 a) Determine [y] and [T] of a two port network whose z parameters are CO4 7 Marks

$[z] = \begin{bmatrix} 6 & 4 \\ 4 & 6 \end{bmatrix}$.

b) Obtain the admidance parameter eqivalent circuit of the two port networn shown in below. CO2 7 Marks



UNIT-V

9 a) For a given symmetrical T-section attenuator, derive the design values of R_1 and R_2 and draw the network of the attenuator with the design value. CO2 7 Marks

b) Determine the characteristics impedance of a symmetrical π network. CO3 7 Marks

(OR)

10 a) Derive the expression for 'm' in a T network high pass filter. CO1 7 Marks

b) Design a π network of m-derived high pass filter having nominal characteristics impedance RO = 900Ω, cut off frequency fC = 2 kHz and infinite attenuation frequency f∞ = 1.8 kHz. CO3 7 Marks

CODE No.: 16BT30301 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations January – 2022

ENGINEERING METALLURGY
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define Metallurgy and List out the Various ores of Metals.	CO2	7 Marks
	b)	Explain the Zones of Cupola.	CO1	7 Marks
		(OR)		
2		Explain the Melting of steel by using any Two Furnaces and discuss the Pros and Cons of the two processes.	CO1	14 Marks

UNIT-II

3	a)	Discuss the allotropy of Iron.	CO4	4 Marks
	b)	Explains Iron – Carbon Equilibrium Diagram with a neat sketch.	CO4	10 Marks
		(OR)		
4	a)	What are the Necessity of Alloying and Explain Hume Rothery Principles?	CO4	6 Marks
	b)	Explain: (i) Monotectic System. (ii) Peritectic System.	CO4	8 Marks

UNIT-III

5	a)	Explain Annealing process and state few differences between annealing and Normalizing.	CO3	8 Marks
	b)	What is: (i) Austempering (i) Martempering.	CO3	6 Marks
		(OR)		
6		Explain TTT Diagram and Discuss Pearlite Transformation.	CO3	14 Marks

UNIT-IV

7		Explain: (i) Flame Hardening. (ii) Nitriding. (iii) Cyaniding.	CO3	14 Marks
		(OR)		
8	a)	Explain the SEM with a Neat Sketch.	CO5	8 Marks
	b)	Explain the Purpose of XRD in Metallographic Study.	CO5	6 Marks

UNIT-V

9	a)	Explain the Sintering Process.	CO6	8 Marks
	b)	What are the necessity characteristics of powders?	CO6	6 Marks
		(OR)		
10		What is Powder Metallurgy? Explain the advantages disadvantages and applications of Powder Metallurgy over Stir Casting.	CO6	14 Marks

❀ ❀ ❀

CODE No.: 16BT30302 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations January – 2022

KINEMATICS OF MACHINERY
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

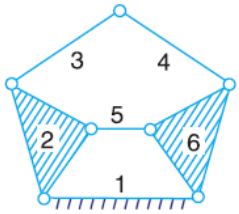
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

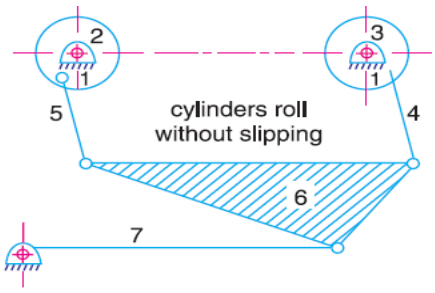
1	a)	Sketch and explain the various inversions of a slider crank chain.	CO1	7 Marks
	b)	Identify the kinematic chains to which the following mechanisms belong: i) Steam engine mechanism. ii) Beam engine. iii) Whitworth quick return motion mechanism. iv) Elliptical trammels.	CO1	7 Marks

(OR)

2	Determine the mobility (degrees of freedom) of the mechanism shown in Fig(a) and (b) using Kutzbach mobility criterion and classify them.	CO2	14 Marks



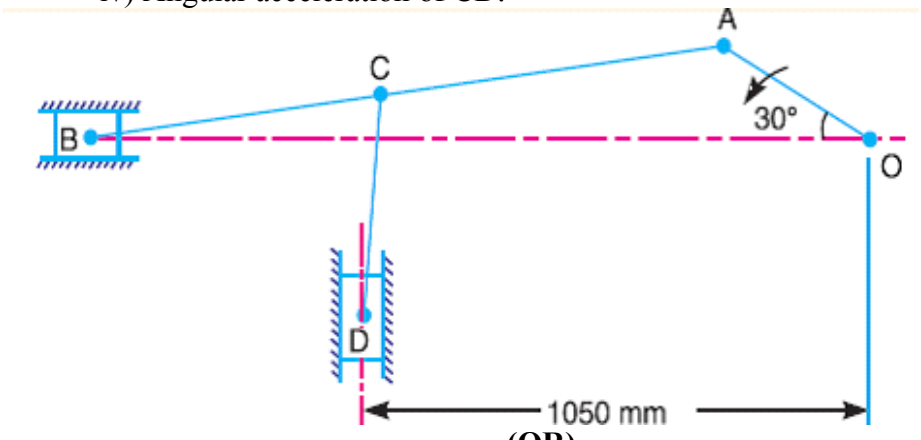
(a)



(b)

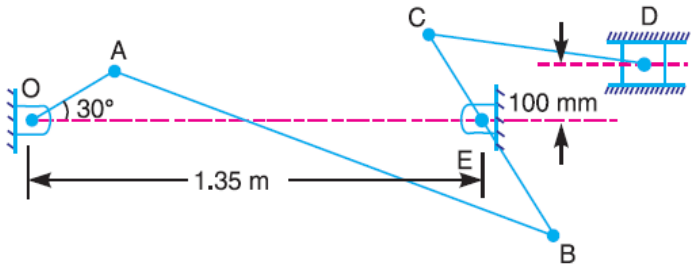
UNIT-II

3	In the mechanism, as shown in fig, the crank OA rotates at 20 r.p.m. anticlockwise and gives motion to the sliding blocks B and D. The dimensions of the various links are OA = 300 mm; AB = 1200 mm; BC= 450 mm and CD = 450 mm. For the given configuration, determine: i) Velocities of sliding at B and D. ii) Angular velocity of CD. iii) Linear acceleration of D. iv) Angular acceleration of CD.	CO2	14 Marks



(OR)

4	a)	What do you understand by the instantaneous centre of rotation (centro) in kinematic of machines? Answer briefly.	CO1	4 Marks
	b)	A mechanism, as shown in fig, has the following dimensions: OA=200mm; AB=1.5m; BC=600mm; CD=500mm and BE=400mm. Locate all the instantaneous centres. If crank OA rotates uniformly at 120 r.p.m. clockwise, find: i) The velocity of B, C and D. ii) The angular velocity of the links AB, BC and CD.	CO2	10 Marks



UNIT-III

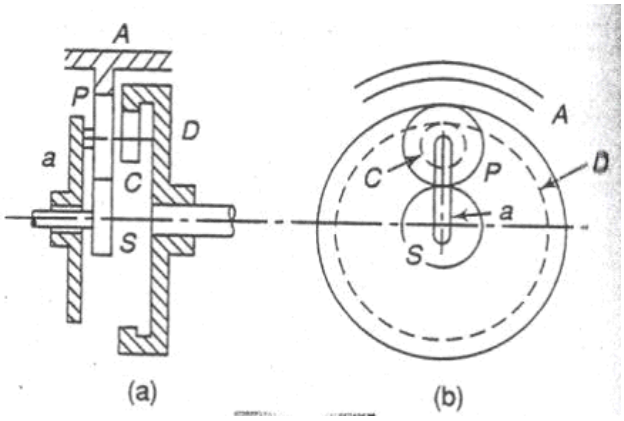
5	a)	What is the condition for correct steering? Sketch and show the two main types of steering gears and discuss their relative advantages.	CO2	7 Marks
	b)	The driving shaft of a Hooke's joint runs at a uniform speed of 240 r.p.m. and the angle α between the shafts is 20°. The driven shaft with attached masses has a mass of 55 kg at a radius of gyration of 150 mm. i) If a steady torque of 200 N-m resists rotation of the driven shaft, find the torque required at the driving shaft, when θ = 45°. ii) At what value of 'α'will the total fluctuation of speed of the driven shaft be limited to 24 r.p.m?	CO2	7 Marks

(OR)

6	a)	Sketch a pantograph, explain its working and show that it can be used to reproduce to an enlarged scale a given figure.	CO2	7 Marks
	b)	Two shafts are connected by a universal joint. The driving shaft rotates at a uniform speed of 1200 r.p.m. Determine the greatest permissible angle between the shaft axes so that the total fluctuation of speed does not exceed 100 r.p.m. Also calculate the maximum and minimum speeds of the driven shaft.	CO2	7 Marks

UNIT-IV

7	a)	What is a reverted gear train? Where is it used?	CO2	7 Marks
	b)	In a reduction gear shown in figure the input S has 24 teeth. P and C constitute a compound planet having 30 and 18 teeth respectively. If all the gears are of the same pitch, find the ratio of the reduction gear. Assume A to be fixed.	CO2	7 Marks



(OR)

8	a)	Define arc of contact and deduce the expression to find its magnitude.	CO2	7 Marks
	b)	A pinion has 24 teeth and drives a gear with 64 teeth. The teeth are of involute type with 20^0 pressure angle. The addendum and the module are 8mm and 10mm respectively. Determine path of contact, arc of contact and the contact ration.	CO2	7 Marks

UNIT-V

9		A cam is to give the following motion to a knife-edged follower: i) Outstroke during 60° of cam rotation. ii) Dwell for the next 30° of cam rotation. iii) Return stroke during next 60° of cam rotation. iv) Dwell for the remaining 210° of cam rotation. The stroke of the follower is 40 mm and the minimum radius of the cam is 50 mm. The follower moves with uniform velocity during both the outstroke and return strokes. Draw the profile of the cam when (a) the axis of the follower passes through the axis of the cam shaft, and (b) the axis of the follower is offset by 20 mm from the axis of the cam shaft.	CO2	14 Marks

(OR)

10		A cam drives a flat reciprocating follower in the following manner: During first 120° rotation of the cam, follower moves outwards through a distance of 20 mm with simple harmonic motion. The follower dwells during next 30° of cam rotation. During next 120° of cam rotation, the follower moves inwards with simple harmonic motion. The follower dwells for the next 90° of cam rotation. The minimum radius of the cam is 25 mm. Draw the profile of the cam.	CO2	14 Marks

CODE No.: 16BT30303 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations January – 2022

MANUFACTURING TECHNOLOGY
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Describe the different types of patterns used in modern foundry.	CO2	7 Marks
	b)	Briefly explain the allowance provided on a pattern.	CO2	7 Marks
		(OR)		
2	a)	Enumerate the various types of moulding machines used in foundry.	CO2	7 Marks
	b)	Define a core. Explain various types of cores used in moulding practice.	CO3	7 Marks
		UNIT-II		
3	a)	With the help of neat sketch, explain the process of investment casting.	CO3	7 Marks
	b)	With the help of neat sketch, explain the Die casting.	CO3	7 Marks
		(OR)		
4	a)	Explain the inspection and testing methods used in foundry.	CO4	7 Marks
	b)	Explain various casting defects.	CO4	7 Marks
		UNIT-III		
5	a)	Distinguish between hot working and cold working.	CO5	7 Marks
	b)	Discuss various types of rolling mills with neat sketch.	CO5	7 Marks
		(OR)		
6	a)	Describe the various types of dies used in sheet metal operations.	CO4	7 Marks
	b)	Explain the Electro-hydraulic forming process with neat sketch.	CO4	7 Marks
		UNIT-IV		
7	a)	Explain the types of gas welding flames and under what conditions they are used.	CO1	7 Marks
	b)	Bring out the difference between TIG and MIG welding.	CO1	7 Marks
		(OR)		
8	a)	With the help of neat sketch, explain the thermit welding process.	CO1	7 Marks
	b)	Sketch the different types of weld defects and mention how they occur.	CO4	7 Marks
		UNIT-V		
9	a)	Describe briefly the principle of blow moulding process.	CO5	8 Marks
	b)	What are the advantages and applications of transfer moulding?	CO4	6 Marks
		(OR)		
10	a)	Describe the principle of calendaring process with the help of neat sketch.	CO5	8 Marks
	b)	Differentiate between direct extrusion and indirect extrusion.	CO4	6 Marks

❀ ❀ ❀

CODE No.: 16BT30304 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations January – 2022

STRENGTH OF MATERIALS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define three Elastic constants and derive the relation between the three elastic constants.	CO1	8 Marks
	b)	A polyethylene bar having diameter d_1= 70mm is placed inside a steel tube having inner diameter d_2 = 70.2mm. The polyethylene bar is then compressed by an axial force P. At what value of the force P the space between polyethylene bar and the steel tube be closed. (For polyethylene, assume E= 1.4 Gpa and Poisson's ratio =0.4.	CO2	6 Marks

(OR)

2		Two vertical rods one of steel and other of copper are each rigidly fixed at the top and 50cm apart. Diameters and lengths of each rod are 2cm and 4m respectively. A cross bar fixed to the rods at the lower ends carries a load of 5000N such that the cross bar remains horizontal even after loading. Find the stress in each rod and the position of the load on the bar. Take E for steel = 2 x 10^5N/mm^2 and E for copper = 1 x 10^5N/mm^2.	CO5	14 Marks

UNIT-II

3		Draw the shear force and bending moment diagram for the beam shown in Fig. 1. Locate the point of contraflexure, if any. Also find the point of maximum bending moment.	CO6	14 Marks

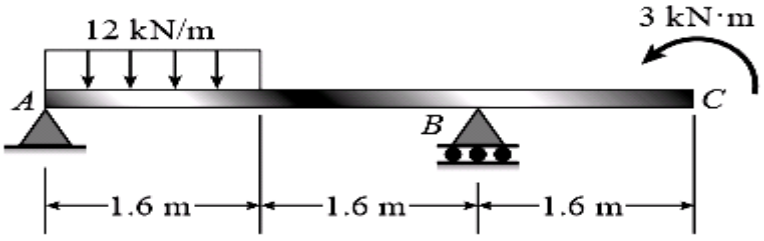


Fig.1

(OR)

4		Draw the shear force and bending moment diagram for the beam shown in Fig. 2	CO6	14 Marks

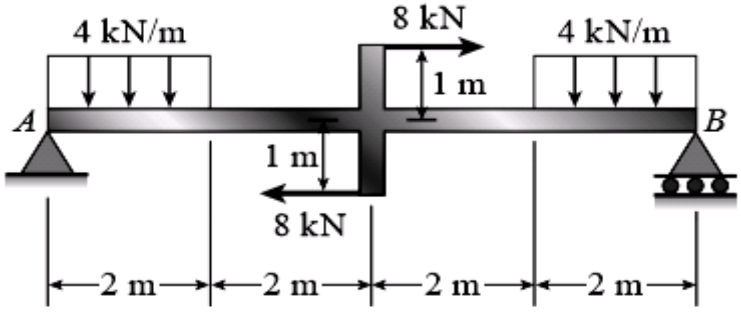


Fig.2

UNIT-III

5	a)	Define torsional rigidity and write the limitations of torsion equation.	CO1	6 Marks
	b)	A copper rod of length L is to be twisted by torques T until the angle of rotation between the ends of rod is 3^0. i) If the length L = 460mm and allowable shear strain in copper is 0.0006 rad, what is the maximum possible diameter of the rod. ii) If the rod diameter is 12.5mm, what is the minimum permissible length of the rod.	CO2	8 Marks

(OR)

6	a)	Define pure bending and write the assumptions in deriving bending equation.	CO1	6 Marks
	a)	A seesaw weighing 45N/m of length is occupied by two children each weighing 400N. The centre of gravity of each child is 2.5m from the fulcrum. The board is 6m long 200mm wide and 40mm thick. What is the maximum bending stress in the board?	CO3	8 Marks

UNIT-IV

7		Calculate the slope at ends and deflection at the middle of over hang beam of length 'L' between supports and over hang on both sides by length L/3 subjected to the following loads. i) When a concentrated load 'P' acts at the ends. ii) When a UDL of intensity 'w' per unit run act over entire span.	CO4	14 Marks

(OR)

8		Anoil pipe of 5m length and of uniform circular cross section 20mm diameter is simply supported at the ends. A man weighs100KN load stands at centre of it. In addition to this it carries oil with full of pipe having density 800 Kg/m^3 run over its entire length. Calculate: i) Maximum slope and maximum deflection of pipe. ii) Slope and deflection at 3m from one end. Take E for pipe = 210 GN/m^2.	CO4	14 Marks

UNIT-V

9		A thin cylindrical vessel is made of steel plate 6mm thick. The length and internal diameter of the vessel are 150cm and 36cm respectively. Determine the longitudinal and circumferential stresses in the cylindrical shell due to an internal fluid pressure of 4N/mm^2. Also calculate the increase in length, diameter and volume of the vessel. Take E = 2 x 10^5N/mm^2 and poisson's ratio of 0.27.	CO3	14 Marks

(OR)

10		Determine the maximum and minimum hoop stress across the section of a pipe of 600mm internal diameter and 150mm thick, when the pipe contains a fluid at a pressure of 10N/mm^2. Also sketch the radial pressure distribution and hoop stress distribution across the section.	CO6	14 Marks

❀ ❀ ❀

CODE No.: 16BT30305 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations January – 2022

THERMODYNAMICS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What is meant by Quasistatic process? Explain such a process in detail with the help of a neat sketch.	CO1	4 Marks
	b)	State Zeroth law of Thermodynamics and explain how it forms the basis for temperature measurement.	CO1	6 Marks
	c)	Discuss about Point functions and Path functions with suitable examples.	CO1	4 Marks

(OR)

2	a)	Prove that for polytropic process heat transfer is given by, $Q = \frac{k-n}{k-1} x W$, Where W is work transfer; k is adiabatic index and n is polytropic index.	CO1	6 Marks
	b)	Air at 1.02 bar, 22^0C, initially occupying a cylinder volume of 0.015 m^3, is compressed reversibly and adiabatically by a piston to a pressure of 6.8 bar. Calculate: i) The final temperature. ii) The final volume. iii) The work done.	CO2	8 Marks

UNIT-II

3	a)	Derive SFEE as applied to a flow process and state the assumptions made in deriving this equation.	CO1	7 Marks
	b)	A stream of gases at 7.5 bar, 750 C and 140 m/s is passed through a turbine of a jet engine. The stream comes out the turbine at 2 bar, 550 C and 280 m/s. The process may be assumed adiabatic. The enthalpies at the entry and exit of the turbine are 950 kJ/kg and 650 kJ/kg of gas respectively. Determine the capacity of the turbine if the gas flow is 300 kg/min.	CO2	7 Marks

(OR)

4	a)	State and prove Carnot's theorem.	CO1	7 Marks
	b)	Using an engine of 30 % thermal efficiency to drive a refrigerator having a COP of 5, what is the heat input into the engine for each MJ removed from the cold body by the refrigerator? If this system is used as a heat pump, how many MJ of heat would be available for heating for each MJ of heat input in the engine?	CO3	7 Marks

UNIT-III

5	a)	State and Prove Clausius Inequality.	CO4	7 Marks
	b)	A mass of 'm' of fluid at temperature T_1 is mixed with an equal mass of same fluid at T_2. Prove that the resultant change of entropy in the universe is $2mc \ln\left(T_1 + \frac{T_2}{2}\right) / (T_1 T_2)^{1/2}$ and prove that it is always positive.	CO4	7 Marks

(OR)

6	a)	How does useful work differ from reversible work? Give the expression for reversible work in a steady flow process under a given environment.	CO4	6 Marks
	b)	Air expands through a turbine from 500 kPa, 520 C to 100 kPa 300 C. During expansion 10 kJ/kg of heat is lost to the surroundings which is at 98 kPa, 20 C. Neglecting the K.E and P.E changes, determine per kg of air i) The decrease in availability. ii) The maximum work. iii) The irreversibility. For air, take C_p = 1.005 kJ/kg K, and the p, v and T relation as TdS=dU + pdV	CO4	8 Marks

UNIT-IV

7	a)	Briefly explain the formation of steam with the help of P-v , T-Q and T-v diagrams.	CO1	6 Marks
	b)	Steam at 10 bar and 300 C is expanded isentropically to 2 bars. Find change in entropy, change in enthalpy, and change in internal energy of steam per kg of steam.	CO2	8 Marks

(OR)

8	a)	What is an Ideal gas? Explain the equation of state applied to perfect gas.	CO1	4 Marks
	b)	A large insulated vessel is divided into two chambers, one containing 5 kg of dry saturated steam at 0.2 MPa and the other 10 kg of steam, 0.8 quality at 0.5 MPa. If the partition between the chambers is removed and the steam is mixed thoroughly and allowed to settle, find the final pressure, steam quality, and entropy change in the process.	CO2	10 Marks

UNIT-V

9	a)	Derive an expression for thermal efficiency of Dual combustion cycle.	CO4	7 Marks
	b)	Two engines are to operate on Otto and Diesel cycles with the following data: Maximum temperature = 1500 K, exhaust temperature = 700 K. ambient conditions = 1bar and 300 K. Compare the compression ratios, maximum pressures and efficiencies of the two engines.	CO5	7 Marks

(OR)

10	a)	Show that the thermal efficiency of Joule cycle depends only on pressure ratio r_p.	CO4	7 Marks
	b)	The following data refers to a Diesel cycle: Compression ratio = 16:1; Heat added = 2500 kJ/kg Lowest pressure in the cycle = 1 bar; Lowest temperature in the cycle = 27° C Determine: i) Mean effective pressure. ii) Salient point temperatures. iii) Thermal efficiency.	CO5	7 Marks

CODE No.:16BT30401 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations January – 2022

ELECTRONIC CIRCUIT ANALYSIS AND DESIGN

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	For a CE amplifier, if a load R_L = 1KΩ is connect and h_{ie} = 1KΩ, $h_{re} = 2x10^{-4}$, h_{oe} = 25μA/V then calculate A_V, A_I, and R_i using exact analysis.	CO2	8 Marks
	b)	Discuss the effect of emitter by pass capacitor on low frequency response of BJT amplifiers.	CO1	6 Marks
		(OR)		
2	a)	Discuss the effects of cascading amplifiers.	CO1	4 Marks
	b)	Draw the circuit of 2-stage RC coupled amplifier and derive the gain at lower cut-off frequency with the help of h-parameter equivalent circuit.	CO2	10 Marks

UNIT-II

3	a)	Derive the expressions for feedback conductance and base spreading resistance of CE amplifier at high frequencies using hybrid-π model.	CO2	8 Marks
	b)	Draw the Emitter Follower circuit diagram and its high frequency equivalent circuit.	CO1	6 Marks
		(OR)		
4	a)	Discuss how capacitive elements affect the high frequency response of a JFET amplifier.	CO2	6 Marks
	b)	Draw the circuit diagram of small signal equivalent circuit at high frequencies of CS amplifier and derive the expressions for voltage gain, input impedance and input capacitance.	CO1	8 Marks

UNIT-III

5	a)	Discuss the effect of negative feedback on the various characteristics of the amplifier.	CO1	6 Marks
	b)	An amplifier has voltage gain with feedback is 100. If the gain without feedback changes by 20% and the gain with feedback should not vary more than 2%. Determine the values of open loop gain A and feedback ratio β.	CO4	8 Marks
		(OR)		
6	a)	In Hartley oscillator, L_2 = 0.4mH, C = 0.004μF. If the frequency of oscillator is 120KHz, find the value of L_1 and the minimum gain required of oscillation.	CO4	6 Marks
	b)	Draw and explain the circuit of the Wien Bridge oscillator. Derive the expressions for its frequency of oscillations and the minimum gain required for the system to oscillate.	CO2	8 Marks

UNIT-IV

7	a)	Draw the circuit of a complementary symmetry push-pull amplifier and explain its operation. Derive an expression for maximum power output.	CO1	10 Marks
	b)	Calculate the effective load resistance looking into the primary of a 10:1 transformer connected to an output load of 32Ω.	CO4	4 Marks
		(OR)		

8	a)	Draw the circuit of series fed class A power amplifier and explain its operation. Derive an expression for conversion efficiency.	CO2	8 Marks
	b)	Explain the classification of power amplifiers based on period of conduction.	CO1	6 Marks

UNIT-V

9	a)	What is a tuned amplifier? Explain the classification of tuned amplifiers.	CO1	6 Marks
	b)	What is the importance of Stagger tuning? Explain briefly about stagger tuned amplifier.	CO1	8 Marks

(OR)

10	a)	Draw the equivalent circuit of inductively coupled single tuned amplifier and derive the expression for voltage gain.	CO2	8 Marks
	b)	Draw the circuit of a Class-C tuned amplifier and explain its operation.	CO1	6 Marks

CODE No.:16BT30402 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

SIGNALS AND SYSTEMS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) The system that follow have input x(t) and output Y(t) determine whether it is: CO1 10 Marks

i) memory less. ii) Stable. iii) Causal.
iv)Linear. v) Time – invariant.

$$y(t) = \int_{-\alpha}^{2t} x(\tau)\,d\tau$$

b) Explain why impulse, unit step, ramp are called singularity functions. CO2 4 Marks

(OR)

2 a) Sketch the following signals CO1 6 Marks

i) $x(t) = \text{sgn}(\sin\frac{\pi}{T}t)$; ii) $x(t) = u\left(\sin\frac{\pi}{T}t\right) - u\left(-\sin\frac{\pi}{T}t\right)$.

b) Suppose that $x(t)=\begin{cases}1, & 0 \le t \le 1\\ 0, & \text{else where}\end{cases}$ and h(t)=x(t/α), where 0< α ≤ 1. CO2 8 Marks

i) Determine and sketch y(t)=x(t) *h(t) using Graphical convolution.

ii) *If* $\frac{d}{dt}y(t)$ Contains only three discontinuities, what is the value of α?

UNIT-II

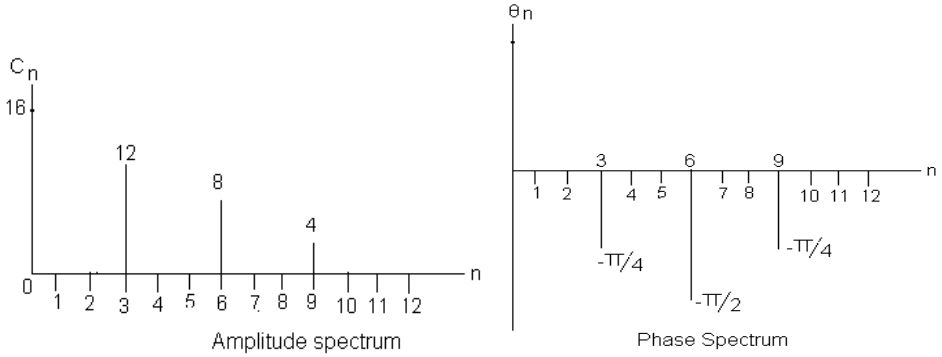
3 a) Show that for half-wave symmetry ic, $x(t)=-x\left(t \pm \frac{T}{2}\right)$; CO4 8 Marks

$a_o = 0$; $a_n=b_n=0$ for n even

$$a_n = \frac{4}{T}\int_0^{T/2} x(t)\cos(n\omega_0 t)\,dt \quad \text{n odd}$$

$$b_n = \frac{4}{T}\int_0^{T/2} x(t)\sin(n\omega_0 t)\,dt \quad \text{n odd}$$

b) The trigonometric Fourier spectra (line spectra) of a certain periodic signal x(t) are shown below. By inspecting these spectra, sketch the corresponding exponential Fourier spectra and verify your results analytically. CO5 6 Marks



(OR)

4	a)	Find the Fourier transform of the following signals using Fourier Transform properties. i) $g(t) = A\,rect\left(\frac{t}{T}\right)\cos(\omega_c t)$; ii) $g(t) = \left(\frac{1}{1+jt}\right)$.	CO5	8 Marks
	b)	Find the total area under the function $x(t) = 10\,\text{sinC}\left(\frac{t+4}{7}\right)$ using Fourier Transform properties.	CO5	6 Marks

UNIT-III

5	a)	State and prove Parseval's Energy theorem.	CO1	8 Marks
	b)	Find and sketch the autocorrelation function $R_{XX}(\tau)$ for $x(t) = e^{-at}\,u(t)$ for, $a > 0$.	CO4	6 Marks
		(OR)		
6	a)	State and prove the auto correlation properties.	CO1	7 Marks
	b)	Show that cross correlation and cross power spectral density forms a Fourier transform pair.	CO4	7 Marks

UNIT-IV

7	a)	A causal and stable LTI system S has the frequency response $H(\omega) = \frac{4+j\omega}{6-\omega^2+5j\omega}$ i) Determine a differential equation relating the input $x(t)$ and output $y(t)$ of S. ii) Determine the impulse response $h(t)$ of S. iii) What is the output of S when the input is $x(t)=e^{-4t}\,u(t)-te^{-4t}\,u(t)$.	CO5	10 Marks
	b)	Use the convolution property of the Laplace transform to determine $y(t)=e^{at}\,u(t) * e^{bt}\,u(t)$.	CO4	4 Marks
		(OR)		
8	a)	Find the inverse Laplace transform of $H(S) = \frac{4S^2+15S+8}{(S+2)^2(S-1)}$ assuming that (i) $h(t)$ is Causal and (ii) The Fourier transform of $h(t)$ exists ic; $h(t)$ is absolutely integrable.	CO4	7 Marks
	b)	Determine the Laplace Transform of the signal $g(t) = \frac{1}{t}\sin(\omega t)\,u(t)$ using unilateral Laplace Transform.	CO5	7 Marks

UNIT-V

9	a)	Determine the Z-transform of the sequence and mention its ROC. i) $g(n) = n\,a^n\,u(n)$; ii) $g(n) = \lvert n\rvert\,a^{\lvert n\rvert}$	CO5	8 Marks
	b)	A signal $x(t) = \cos(200\pi t) + 2\cos(320\pi t)$ is ideally sampled at $f_s = 300$Hz. If the sampled signal is passed through an ideal low-pass filter with a gain $\frac{1}{f_s}$ and cut off frequency of 250Hz, what frequency components will appear in the output?	CO4	6 Marks
		(OR)		
10		Determine the inverse Z-transform of $X(z) = \frac{1}{1-1.5z^{-1}+0.5z^{-2}}$ it i) ROC $\lvert z\rvert > 1$. ii) ROC $\lvert z\rvert < 0.5$. iii) ROC $0.5 < \lvert z\rvert < 1$.	CO5	14 Marks

❀ ❀ ❀

CODE No.:16BT30403 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations January – 2022

SWITCHING THEORY AND LOGIC DESIGN

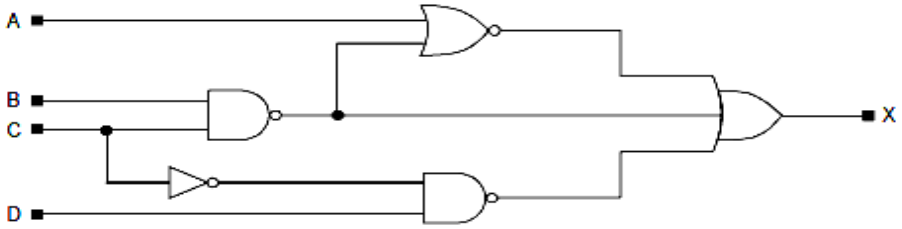
[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Convert the following numbers the three bases indicated. i) Decimal 225 to binary, octal and hexadecimal. ii) Octal 623 to decimal, binary and hexadecimal.	CO1	6 Marks
	b)	Write the logic expression and simplify it as much as possible and draw a logic diagram that implements the simplified expression.	CO1	8 Marks



(OR)

2	a)	Verify that the following operations are commutative and associative. i) *AND* . ii) *EX-OR.*	CO1	6 Marks
	b)	Find the complement of the following expressions: i) $xy' + x'y$. ii) $(AB' + C)D' + E$.	CO1	8 Marks

UNIT-II

3	a)	Simplify the following Boolean functions using K-maps. $F(A, B, C, D, E) = \Sigma(0, 2, 3, 4, 5, 6, 7, 11, 15, 16, 18, 19, 23, 27, 31)$.	CO5	8 Marks
	b)	Find the minimised product-of-sums expression for $F(A, B, C, D) = \Sigma(5, 7, 9, 10, 11) + \Sigma(2, 13, 15)$	CO5	6 Marks

(OR)

4	a)	Minimize using K-maps and realize using NAND gates. $F(A,B,C,D,E) = \Pi(6, 9, 11, 13,1 4, 17, 20, 25, 28, 29, 30)$	CO5	8 Marks
	b)	Realize EX-NOR using minimum number of NOR gates.	CO2	6 Marks

UNIT-III

5	a)	A majority function is generated in a combinational circuit when the output is equal to 1 if the input variables have more 1's than 0's. The output is 0 otherwise. Design a 3 input majority function.	CO3	6 Marks
	b)	Describe the working of a code converter that does binary to gray code conversion. The converter has 3 input lines.	CO2	8 Marks

(OR)

6	a)	Design a combinational circuit with four inputs and four outputs. The output generates the 2's complement of the input binary number.	CO3	8 Marks
	b)	Implement a full subtractor function using 4 x 1 multiplexers.	CO2	6 Marks

UNIT-IV

7	a)	What is a characteristic equation? Obtain the characteristic equations for SR, JK, D and T flip-flops.	CO2	6 Marks
	b)	Construct a BCD ripple counter using JK flip-flops.	CO5	8 Marks

(OR)

8	a)	Illustrate the operation of a 4 bit parallel-in serial-out shift register.	CO1	8 Marks
	b)	Draw the state diagram and state table of SR flip-flop.	CO2	6 Marks

UNIT-V

9	a)	Implement a full adder using PAL.	CO3	7 Marks
	b)	Implement the following two Boolean functions with a PLA: $F_1(A,B,C) = \Sigma m(0, 1, 2, 4)$; $F_2(A, B, C) = \Sigma m(0, 5, 6, 7)$.	CO3	7 Marks
		(OR)		
10	a)	Show how the PLA circuit would be programmed to implement the 3 bit binary to gray conversion?	CO3	8 Marks
	b)	Illustrate about various types of ROM.	CO1	6 Marks

CODE No.:16BT30441 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

ANALOG ELECTRONIC CIRCUITS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Draw the circuit of an emitter follower and derive the expressions for A_I, A_V, R_i, and R_o in terms of CE parameters.	CO2	10 Marks
	b)	An amplifier has three identical noninteracting cascaded stages. Each stage has lower and upper 3-dB frequencies of 25Hz and 120KHz. Calculate the lower and upper 3-dB frequencies of overall cascaded amplifier.	CO1	4 Marks

(OR)

2	a)	Obtain the expression for short circuit current gain of a CE amplifier as a function of frequency.	CO2	8 Marks
	b)	For a BJT amplifier, the following values are known: operating temperature T = 300°K, I_{CQ} = 2mA, $r_{bb'}$ = 100Ω, $r_{b'e}$ = 1000Ω, $r_{b'c}$ =2MΩ, r_{ce} = 80KΩ, $C_{b'e}$ = 200pF, $C_{b'c}$ = 3pF, f_T = 50MHz. Obtain the h parameters if K = 1.381×10^{-23} J/°K and q = 1.6×10^{-19}C.	CO3	6 Marks

UNIT-II

3	a)	Classify the amplifier based on feedback topology and give their block diagrams. How the input and output impedance are affected in each case?	CO1	8 Marks
	b)	An amplifier requires an input signal of 60mV to produce a certain output. With a negative feedback to get the same output, the required input signal is 0.5V. The voltage gain with feedback is 90. Find the open loop gain and feedback factor.	CO3	6 Marks

(OR)

4	a)	In a Hartley oscillator, L_1 = 15mH and C = 50pF. Calculate L_2 for a frequency of 168 KHz. The mutual inductance between L_1 and L_2 is 5μH. Also find the required gain of the transistor to be used for the oscillations.	CO3	6 Marks
	b)	Draw the circuit diagram of Hartley oscillator and explain the principle of operation. Derive an expression for the frequency of oscillations.	CO2	8 Marks

UNIT-III

5	a)	Draw the circuit of transformer coupled class A power amplifier and explain its operation. Derive an expression for conversion efficiency.	CO2	8 Marks
	b)	In a class B power amplifier $V_{CE,min}$ = 2V and V_{CC} = 15V. Find the collector circuit efficiency.	CO3	6 Marks

(OR)

6	a)	Compare the parameters of class A, class B, class AB, class C and class D power amplifiers.	CO1	6 Marks
	b)	Draw the push pull power amplifier circuit. Derive the expression for the output current in push pull amplifier with base current as $I_B = I_{bm}$ Sinωt.	CO2	8 Marks

UNIT-IV

7	a)	Explain in detail how a low pass RC circuits act as an integrator.	CO1	6 Marks
	b)	Derive the relation between rise time and RC time constant of a low pass RC circuit excited by a pulse input signal.	CO2	8 Marks

(OR)

8	a)	Explain the principle of clamping. What is the need for a shunt resistance R in parallel with the diode in the basic clamping circuit?	CO2	8 Marks
	b)	Draw the circuit diagram of a double clipping circuit using diodes to clip at two different reference levels and draw its transfer characteristics and explain its operation.	CO1	6 Marks

UNIT-V

9	a)	What is an astable multivibrator? With the help of neat circuit diagram, explain how the astable multivibrator can be modified as voltage-to-frequency convertor.	CO1	6 Marks
	b)	A Schmitt trigger circuit has the following component values $R_1=R_2=20K\Omega$, $R_{c1} = R_{c2} = 5K\Omega$ and $R_e = 2K\Omega$. The supply voltage is 15V. If npn silicon transistors are used with $h_{fe} = 100$, find the UTP and LTP.	CO4	8 Marks

(OR)

10	a)	Draw the circuit diagram of collector-coupled monostable multivibrator and derive an expression for the gate width.	CO1	6 Marks
	b)	Determine the values of capacitors to be used in an astable multivibrator to provide a train of pulse width 2μs with a repetitive rate of 100KHz, if $R_1 = R_2 = 20K\Omega$	CO2	8 Marks

CODE No.: 16BT30501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations January – 2022

COMPUTER ORGANIZATION

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Why register transfer language is needed and give the examples for some micro operations?	CO2	7 Marks
	b)	Give different symbolic representations that we use in the register transfer micro operations.	CO2	7 Marks
		(OR)		
2	a)	i) Design a block diagram that implements the following statements x+yz: AR ← AR+BR. Where AR and BR are 2 n-bit registers and x,y and z are control variables. Include the logic gates for the control functions. ii) Construct a logic block using 4-bit adder and 2:1 Mux with the following register transfer statements for two 4-bit registers R_1 and R_2. xT: $R_1 \leftarrow R_1+R_2$. x'T:$R_1 \leftarrow R_2$.	CO3	10 Marks
	b)	Summarize the memory transfer related micro operations with relevant examples.	CO3	4 Marks

UNIT-II

3	a)	Paraphrase different types of arithmetic micro operations and mention the applications of logic micro operations.	CO1	7 Marks
	b)	List out different basic computer registers and explain them related to the operation that they perform.	CO1	7 Marks
		(OR)		
4	a)	In the design of basic computer explain the role of flags and common bus system	CO4	7 Marks
	b)	Design the accumulator logic and explain the operations that are going to be performed in this logic	CO4	7 Marks

UNIT-III

5	a)	What are the advantages and disadvantages of hard wired and micro programmed control?	CO1	7 Marks
	b)	Demonstrate the concept of mapping from instruction code to microinstruction address with an example.	CO1	7 Marks
		(OR)		
6	a)	Describe the concept of decoding of micro-operation fields with respect to design of control unit.	CO5	7 Marks
	b)	Compare horizontal microcode with vertical microcode. State the advantage of micro-programmed control unit.	CO5	7 Marks

UNIT-IV

7	a)	Multiply the (-9) with (-13) using Booth's algorithm. Give each step.	CO6	7 Marks
	b)	Explain Addition and Subtraction with Signed-Magnitude Data and also show its Hardware Implementation.	CO6	7 Marks

(OR)

8	a)	Explain the Hardware Algorithm for multiply operation using flowchart.	CO4	7 Marks
	b)	Discuss the Data manipulation Instructions of CPU.	CO4	7 Marks

UNIT-V

9	a)	i) What is polling? Explain in detail. ii) What is daisy chaining? Explain.	CO1	10 Marks
	b)	Explain 4 x 4 FIFO buffer with neat circuit diagram.	CO1	4 Marks

(OR)

10	a)	Describe in words and by means of a block diagram how multiple matched words can be read out from an associative memory.	CO2	7 Marks
	b)	Demonstrate working of 8089 IOP with block diagram.	CO2	7 Marks

CODE No.: 16BT30503 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations January – 2022

PYTHON PROGRAMMING

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Apply the Type Conversion and write a python script to calculate the Temperature by using the type conversion concept.	CO5	7 Marks
	b)	Explain the concept of arithmetic operations and operators in detail.	CO1	4 Marks
	c)	List the Keywords and other identifiers in Python.	CO1	3 Marks
		(OR)		
2	a)	Define Computer Algorithm and Computer Software.	CO1	4 Marks
	b)	Explain the importance of Computational Problem Solving.	CO1	6 Marks
	c)	Write the short note on the Python Programming Language.	CO1	4 Marks
		UNIT-II		
3	a)	Explain in detail the Boolean Expressions (Conditions) with respective examples.	CO1	10 Marks
	b)	Differentiate between Selection Control and Iterative Control.	CO2	4 Marks
		(OR)		
4	a)	What is Set Data Type in Python with an example?	CO2	6 Marks
	b)	Illustrate the 'if' and 'elif' statements with respective examples.	CO2	8 Marks
		UNIT-III		
5	a)	List the various string methods used in Python programming.	CO1	7 Marks
	b)	Explain the recursion with an example.	CO3	4 Marks
	c)	Define the concept of Program Routine.	CO1	3 Marks
		(OR)		
6	a)	Explain the concept of using text files in Python and illustrate with example.	CO3	7 Marks
	b)	What is Exception Handling? Write the syntax for five (05) exception handlings that are handled in Python.	CO2	7 Marks
		UNIT-IV		
7	a)	Explain the Turtle Graphics. Write the steps involved in creating a Turtle Graphics Window.	CO1	7 Marks
	b)	Describe the fundamental concepts of Object Oriented Programming.	CO1	7 Marks
		(OR)		
8		Apply the concept of Inheritance to the real time example and illustrate in Python script for all the Inheritance types.	CO3	14 Marks
		UNIT-V		
9		Write a program in python to develop a window using any three GUI Components you are desired in GUI Programming.	CO5	14 Marks
		(OR)		
10	a)	Write a program with check buttons and Radio buttons to develop in a window using GUI Components.	CO5	8 Marks
	b)	Explore on the concept of Bound method and Callable Class object in GUI Programming.	CO2	6 Marks

❀ ❀ ❀

CODE No.: 16BT31002 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

SENSORS AND TRANSDUCERS

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Describe various elements of generalized measurement system with a neat block diagram.	CO1	7 Marks
	b)	Discuss various types of errors clearly with the help of examples.	CO1	7 Marks
		(OR)		
2		Explain in detail about resistance, current and inductance standards.	CO6	14 Marks

UNIT-II

3	a)	Define the terms: i) Accuracy. ii) Threshold. iii) Hysteresis. iv) Fidelity.	CO1	8 Marks
	b)	A 41/2 digit voltmeter is used for voltage measurement. Find its resolution. How would 12.75V be displayed on 10V range?	CO3	6 Marks
		(OR)		
4		Derive the equations for time response of a second order under damped system when subjected to unit step input. Also compare overdamped, underdamped and critically damped systems.	CO1	14 Marks

UNIT-III

5	a)	Distinguish between bonded and unbonded strain gauges.	CO1	9 Marks
	b)	A thermistor has β=3140K and the resistance at 27^0C is 1050Ω. The thermistor is used for temperature measurement and resistance measured is as 2330Ω. Find the measured temperature.	CO3	5 Marks
		(OR)		
6		Explain how by using a differential arrangement, a capacitive transducer which works on the principle of variation of capacitance with displacement between two plates, the response can be made linear.	CO2	14 Marks

UNIT-IV

7	a)	Identify the passive transducer which works on mutual inductance for measurement of linear displacement. Explain its working with a neat sketch and draw its characteristics indicating residual voltage.	CO4	7 Marks
	b)	Apply the principle of Hall Effect for the measurement of magnetic flux density.	CO5	7 Marks
		(OR)		
8	a)	Define pyroelectric effect. Discuss any one application of pyroelectric sensor.	CO5	7 Marks
	b)	Describe the working principle of electrochemical sensors with necessary sketches.	CO1	7 Marks

UNIT-V

9	a)	Explain with a sketch the working of an encoder that gives 4–bit digital output proportional to linear displacement.	CO1	8 Marks
	b)	Distinguish between intrinsic and extrinsic fiber optic sensors.	CO1	6 Marks
		(OR)		
10	a)	What is a smart sensor? Explain the configuration of a smart sensor with a neat sketch. List out its advantages.	CO1	7 Marks
	b)	Discuss in detail about the fabrication technique used for micro sensors.	CO1	7 Marks

❀ ❀ ❀

CODE No.: 16BT31201 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations January – 2022

DISCRETE MATHEMATICAL STRUCTURES

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Find the Truth Table for the following: i) {(p^q)V(~p^r)} v (q^r) ii) [(pVq) ^ (~r)] ↔ (q→r)	CO1	7 Marks
	b)	[(P →Q) ^ (R →S) ^ (PVR)] → (QVS) is a Tautology or not? Justify.	CO5	7 Marks
		(OR)		
2	a)	Identify whether the following arguments are valid or invalid: r → s p → q r V p ——— s V q	CO3	7 Marks
	b)	Identify and explain the converse, inverse and contrapositive of the following conditional statement "if the flood destroy my house or the fires destroy my house, then my insurance company will pay me".	CO1	7 Marks

UNIT-II

3	a)	Prove R is an equivalence relation. Let N be the set of natural numbers, that is, N = {1,2,3……..}. Define a relation R in N as follows: R = {(x,y)| x,y ϵ N and x + y is even}.	CO4	7 Marks
	b)	Decide whether each of the relations on { 0, 1, 2 } is reflexive, symmetric, transitive or a combination of these and which are equivalence relations.	CO2	7 Marks
		(OR)		
4	a)	Give some examples of inverse function and composition function.	CO1	7 Marks
	b)	Prove that weather it is lattice or not [$_{D12}$:/]	CO4	7 Marks

UNIT-III

5	a)	State and prove Lagrange's Theorem.	CO2	7 Marks
	b)	Differentiate Homomorphism and Isomorphism with an example.	CO1	7 Marks
		(OR)		
6	a)	If **a** and **b** are the elements of a group(G,*) Show that $(a*b)^{-1} = b^{-1}*a^{-1}$	CO1	7 Marks
	b)	Define Algebraic Structure. List its properties.	CO5	7 Marks

UNIT-IV

7	a)	i) How many different license plates are there that involve 1, 2 (or) 3 letters followed by 1, 2, 3 or 4 digits.	CO4	4 Marks
		ii) Each user on a computer system has a password, which is six to eight characters long, where each character is an uppercase letter or a digit. Each password must contain at least one digit. How many possible passwords are there?	CO4	3 Marks
	b)	Prove that for all Integers $n \geq 4$, $3^n > n^3$. Solve by using Mathematical Induction.	CO4	7 Marks
		(OR)		

8 a) Solve the Recurrence Relation CO4 7 Marks

$a_n-9a_{n-1}+27a_{n-2}-27a_{n-3} = 0$ for $n \geq 3$, where the initial conditions are $a_0=1$, $a_1=2$, $a_2=3$

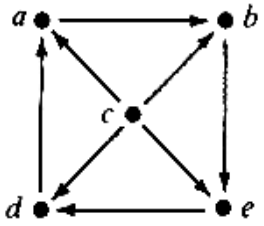
b) i) Find the Coefficient of X^{16} in $(1+X^4+X^8)^{10}$. CO2 7 Marks

ii) Find the Coefficient of X^9 in $(1+x^3+x^8)^{10}$.

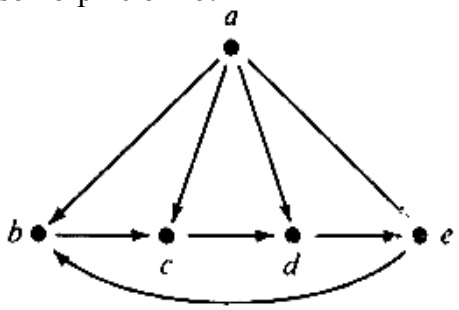
UNIT-V

9 a) Differentiate Eluers Path and Hamiltonian Path with an example. CO2 7 Marks

b) Determine whether Two Graphs are Isomorphic or not CO5 7 Marks



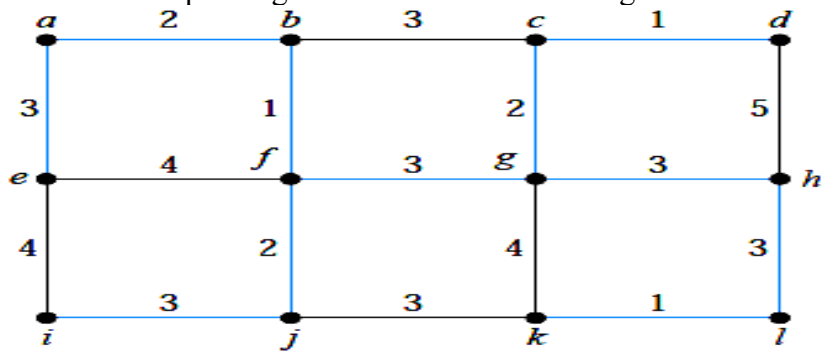
(a)



(b)

(OR)

10 a) Find the Minimal Spanning Tree for the Kruskal's Algorithm CO4 7 Marks



b) Explain the following with an examples. CO3 7 Marks

i) Bipartite Graph.

ii) Four Colour Problem.

iii) Planar Graph.

CODE No.: 16BT31501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

OPERATING SYSTEMS

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain briefly about the services of the operating system that are provided to the user's program.	CO1	5 Marks
	b)	What is IPC? Explain in detail about Inter process communication models.	CO1	9 Marks
		(OR)		
2	a)	Explain the Time-shared Operating system.	CO1	7 Marks
	b)	Compute Average waiting time, Turn around Times for the given scheduling algorithm **s** using gantt chart. i) FCFS. ii) SJF (Pre-emptive).	CO6	7 Marks

Process	Arrival time	Burst time
P1	0	7
P2	2	4
P3	4	1
P4	5	4

UNIT-II

3	a)	Explain perterson's solution to the critical section problem.	CO2	7 Marks
	b)	What is a deadlock? Discuss in detail about Deadlock Recovery.	CO3	7 Marks
		(OR)		
4	a)	What is bounded buffer problem? Give the solution using semaphores.	CO2	7 Marks
	b)	What are the necessary conditions for deadlock? Explain in detail.	CO2	7 Marks

UNIT-III

5	a)	Discuss the hierarchical paging structure.	CO2	7 Marks
	b)	What is demand paging? Discuss the hardware support required to support for demand paging.	CO2	7 Marks
		(OR)		
6	a)	Explain swapping of two processes using a disk as a backing store.	CO2	7 Marks
	b)	Describe operating system fetch policy for virtual memory.	CO2	7 Marks

UNIT-IV

7	a)	Explain in detail about the file attributes and it's operations.	CO3	6 Marks
	b)	Compare SCAN and C-SCAN disk scheduling algorithms with an example.	CO1	8 Marks
		(OR)		
8	a)	Discuss the indexed file allocation method with an example.	CO3	7 Marks
	b)	Explain file free space management approaches.	CO4	7 Marks

UNIT-V

9	a)	Explain in detail about kernel I/O subsystem.	CO5	7 Marks
	b)	What are the main goals of protection?	CO5	7 Marks
		(OR)		
10	a)	Explain the performance aspects of I/O hardware and software.	CO5	7 Marks
	b)	Discuss about revocation of access rights.	CO5	7 Marks

❀ ❀ ❀

CODE No.: 16BT50502 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations January – 2022

LINUX PROGRAMMING

[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What is Unix? Explain characteristics of typical Unix programs and systems.	CO1	7 Marks
	b)	Write the steps in creating and running a C program that prints out "Hello SreeVidyaNikethan" in a Unix/Linux environment.	CO2	7 Marks
		(OR)		
2	a)	What is GNU project and Free Software Foundation?	CO1	8 Marks
	b)	List out the major software from the GNU project distributed under the GPL.	CO1	6 Marks

UNIT-II

3	a)	What is a shell in Linux environment? Explain.	CO2	7 Marks
	b)	Describe the purpose of using shell programming.	CO1	7 Marks
		(OR)		
4	a)	How pipes can be used to connect two processes in Linux? Give examples.	CO3	6 Marks
	b)	Explain variables in shell programming. How they differ from other programming environments?	CO3	8 Marks

UNIT-III

5	a)	Outline the directory structure in Linux file system.	CO5	6 Marks
	b)	What is a system call in Linux? List and explain low level system calls to access device drivers.	CO5	8 Marks
		(OR)		
6	a)	What is difference between system calls and function calls? Why function calls are efficient? Explain.	CO4	7 Marks
	b)	Explain file permissions. What are factors that affect file permissions?	CO4	7 Marks

UNIT-IV

7	a)	What is a process? Describe Linux process structure.	CO1	8 Marks
	b)	How to start a new process using system library functions? Explain.	CO1	6 Marks
		(OR)		
8	a)	What is the difference between a process and thread? What is the purpose of using threads?	CO6	7 Marks
	b)	Illustrate the process of duplicating a process and its purpose.	CO6	7 Marks

UNIT-V

9	a)	What are named pipes? How to create and use named pipes?	CO5	8 Marks
	b)	How to implement simple client/server using FIFO for process synchronization and bidirectional data flow.	CO5	6 Marks
		(OR)		
10	a)	What is a socket? Explain socket connections between server process and client process using examples.	CO1	7 Marks
	b)	How to create a socket? Explain using an example.	CO4	7 Marks

❀ ❀ ❀

CODE No.: 16BT3BS01 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC16) Supplementary Examinations July – 2022

PROBABILITY DISTRIBUTIONS AND STATISTICAL METHODS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science Systems Engineering]

Max. Marks: 70

Time: 3 hours

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Define random variable, Discrete distribution function, variance of discrete distribution function, cumulative distribution function of continuous random variable. CO1 7 Marks

b) For continuous random variable whose p.d.f. is given by CO4 7 Marks

$$f(x) = \begin{cases} k(1-x^2) \text{ for } 0 < x < 1 \\ 0 \quad \text{otherwise} \end{cases},$$

Find (i) K (ii) mean (iii) Variance (iv) $P(1 < X < 2)$.

(OR)

2 a) For the random variable X has the following probability function CO5 7 Marks

X	4	5	6	8
P(X)	0.1	0.3	0.4	0.2

Determine (i) Expectation (ii) standard deviation.

b) A continuous random variable X has the distribution function CO4 7 Marks

$$F(x) = \begin{cases} 0 \quad \text{for } x \le 3 \\ 1 - \frac{9}{x^2} \text{ for } x > 3 \end{cases}, \text{ find } (i) \text{ P } (X < 8) \ (ii) \text{ P } (5 < X < 7).$$

UNIT-II

3 a) The mean and variance of binomial distribution are 4 and $\frac{4}{3}$ respectively. Find P($X \ge 1$). CO4, CO5 7 Marks

b) In a normal distribution 31% of the items are under 45 and 8% are over 64. Find the mean and variance of the distribution. CO4 7 Marks

(OR)

4 a) If a random variable X has passion distribution such that P(X = 1). $\frac{3}{2}$ =P(X= 3). Find (*i*) P ($X \ge 1$) (*ii*) P ($X \le 3$) (*iii*) P ($2 \le X \le 5$). CO4 7 Marks

b) The mean height of students in a class is 158cm with standard deviation of 20cms. Find how many students heights lie between 150cms and 170cms. If there are 100 students in a class. CO4 7 Marks

UNIT-III

5 A machine is set to deliver packets of given weight. 10 samples of size 5 each were recorded. Below the given the relevant data. CO3 14 Marks

Sample No.	1	2	3	4	5	6	7	8	9	10
Mean	15	17	15	18	17	14	18	15	17	16
Range	7	7	4	9	8	7	12	4	11	5

Construct the mean and range charts for the data given and draw the conclusions.

(OR)

6 Determine the coefficient of correlation for the following data. CO2, CO5 14 Marks

Fertiliser	15	18	20	24	30	35	40	50
Productivity	85	93	95	105	120	130	150	160

UNIT-IV

7 a) The mean life time of a sample of 100 light tubes produced by a company is found to be 1560hrs with population standard deviation of 90hrs. Test the hypothesis that the mean life time of the tubes produced by the company is 1580hrs. CO2 7 Marks

b) 20 people were attacked by a disease and only 18 survived. Examine whether you reject the hypothesis that the survival rate if attacked by this disease is 85% in favour of the hypothesis that is more at 5% level. CO2, CO4 7 Marks

(OR)

8 a) In two large populations, there are 30% and 25% respectively are good in English speaking people. Is this difference likely to be hidden in samples of 1200 and 900 respectively from the two populations? CO2, CO5 7 Marks

b) Explain briefly about: CO1 7 Marks

i) Critical region.
ii) Type I and Type II errors.
iii) Degrees of freedom.

UNIT-V

9 a) A random sample of size 16 values from a normal population should a mean of 53 and a sum of squares of deviations from the mean equals to 150. Check whether the sample is taken from the population having mean 56. Find 95% confidence limits of the mean of the population. CO4 7 Marks

b) Two Cars A and B were tested according to the speed to run a particular distance with the following results. CO4 7 Marks

Car A	28	30	32	33	33	29	34
Car B	29	30	30	24	27	29	---

Test 0.01 level of significance whether the two cars have same running capacity.

(OR)

10 The following random samples are measurements of the heat producing capacity (in million of calories per ton) of specimens of coal from two mines. CO4 14 Marks

MINE I	8260	8130	8350	8070	8340	
MINE II	7950	7890	7900	8140	7920	7840

Test 0.02 level of significance; whether it is reasonable to assume that the variances of the two populations sampled are equal.

CODE No.: 16BT3BS02 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC16) Supplementary Examinations July – 2022

SPECIAL FUNCTIONS AND COMPLEX ANALYSIS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Define Beta and Gamma functions. Derive the relation between them and applying it show that $\Gamma\left(\frac{1}{2}\right) = \sqrt{\pi}$.	CO1	14 Marks
		(OR)		
2	a)	Prove that $\frac{d}{dx}[xJ_1(x)] = xJ_0(x)$.	CO4	7 Marks
	b)	Estimate the integral $\int J_0(x)J_1(x)\,dx$.	CO4	7 Marks

UNIT-II

3		Make use of Milne-Thomson method to construct an analytic function $f(z) = u + iv$ if $v = \frac{2\sin x \sin y}{\cos 2x + \cosh 2y}$.	CO4	14 Marks
		(OR)		
4		Write the necessary and sufficient conditions for analyticity and show that the function $f(z) = \sqrt{\lvert xy \rvert}$ is not analytic at the origin although Cauchy-Riemann equations are satisfied at the origin.	CO1, CO4	14 Marks

UNIT-III

5		Analyzing the function $\frac{7z-2}{(z+1)(z)(z-2)}$, identify the regions in which the function can be expanded in Laurent series and expand it about point $z = -1$.	CO2	14 Marks
		(OR)		
6	a)	Construct a Taylor's series for $f(z) = \frac{e^z}{z(z+1)}$ about the point $z = 2$.	CO3	7 Marks
	b)	Write Cauchy's Integral formula and applying it, evaluate $\int_C \frac{z^2-1}{z^2+1}dz$ where $c: \lvert z-i \rvert = 1$.	CO1, CO4	7 Marks

UNIT-IV

7		By using complex variable technique, evaluate $\int_{-\infty}^{\infty} \frac{x^2}{(x^2+1)(x^2+4)}dx$.	CO5, CO4	14 Marks
		(OR)		
8		By the technique of complex variables, show that $\int_0^{\infty} \frac{\cos mx}{(x^2+a^2)^2}dx = \frac{\pi}{4a^3}(1+ma)e^{-ma}$ $(a > 0)$.	CO5, CO1, CO4	14 Marks

UNIT-V

9	a)	Define a conformal transformation and Identify the points at which the transformation $w = \cosh z$ is not conformal.	CO1	7 Marks
	b)	Find the image of the ring shaped region $1 < \|z\| < 2$ under the transformation $w = 2iz + 1$.	CO4	7 Marks

(OR)

10	a)	Establish an image for the triangular region with vertices (0, 0) (1, 0) and (0, 1) under the transformation $w = (1 - i)\, z + 3$ and identify the shape of the image region.	CO4	7 Marks
	b)	Find a bilinear transformation which maps the points –1, 0, 1 onto the points 1, 0, 1 respectively.	CO3	7 Marks

CODE No.: 16BT3HS02 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC16) Supplementary Examinations July – 2022

MANAGERIAL ECONOMICS AND PRINCIPLES OF ACCOUNTANCY
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	"Nature of the product largely determines the quantity demanded."Justify.	CO1 CO3	14 Marks

(OR)

2	Discuss various survey methods of demand forecasting with suitable examples.	CO2 CO3	14 Marks

UNIT-II

3	Critically examine the importance of cost concepts in general and short-run costs specifically.	CO2 CO3	14 Marks

(OR)

4	Compute BEP and Margin of Safety during period II from the given data.	CO4	14 Marks

Particulars	Period I	Period II
Sales(Rs.)	2,00,000	3,00,000
Profit(Rs.)	20,000	40,000

UNIT-III

5	"Is monopoly socially desirable market scenario?"Comment.	CO1 CO2	14 Marks

(OR)

6	Write a short note on: i) Market Penetration. ii) Market Skimming. iii) Cross Subsidization	CO1	14 Marks

UNIT-IV

7	For the following transactions pass necessary Journal entries in the books of Charishma for the month of October 2016. Oct. 1 Charishma commenced a business with Cash Rs. 26,000/- B/R Rs.14,000/- Motor Vehicles Rs. 40,000/- B/P Rs. 10,000/- Creditors Rs.20,000/- Oct. 5 Bought goods from Kali Rs.36,400/- Oct. 9 Cash paid to Kali Rs.36,000/- in full settlement of his account. Oct. 16 Sold goods to Neelima Rs. 44,600/- Oct. 25 Cash received from Neelima Rs.44,000/- in full settlement of her account. Oct. 31 Salaries paid through cheque Rs.16,800/-	CO2 CO5 CO6	14 Marks

(OR)

8	For the following transactions pass necessary journal entries in the books of Jeevan. 2015 Sep. 1 Jeevan commenced a business with Rs. 15, 00,000/- Sep. 6 Bought goods from Sheetal Agencies for cash Rs.1,00,000/- Sep. 17 Bought goods by Surya Rs. 48,000/- Sep. 21 Commission received Rs. 3,000/- Sep 28 Surya returned goods Rs.1,000/- Sep. 30 Goods worth Rs. 20,000/- gifted to brother.	CO2 CO3 CO6	14 Marks

UNIT-V

9 A Book keeper has submitted to you the following Trail Balance: CO4 CO5 CO6 14 Marks

Particulars	Debit (Rs)	Credit (Rs)
Capital		7,610
Cash in hand	30	
Purchases	8,990	
Sales		11,060
Cash at Bank	885	
Fixtures and Fittings	225	
Free hold Premises	1,500	
Lighting and Heating	65	
Bills Receivable	825	
Returns inwards	30	
Salaries	1,075	
Creditors		1,950
Debtors	5,700	
Stock on January 1-2011	3,000	
Printing	225	
Bills Payable		1,875
Rates, taxes and insurance	190	
Discounts receive		445
Discounts allowed	200	
Total	**22,940**	**22,940**

Stock on 31st Dec 2011 was valued at Rs. 1,800/-.

You are required to prepare Trading and Profit & Loss Account for the year ended Dec 31, 2011.

(OR)

10 From the following balances of accounts in the books of M/s Kavitha, prepare Trading, profit and loss account for the year ending March 31, 2018 and also Prepare balance sheet as on that date taking into account the following CO4 CO5 CO6 14 Marks

Particulars	Amount	Particulars	Amount
capital	450,000	Salaries	75,000
Sales	1,000,000	Commission (Dr)	15,000
Purchases	400,000	Interest (Dr)	10,000
Sales Returns	10,000	Gas, Water and Power	30,000
Purchases returns	15,000	Loan form HARS	50,000
creditors	200,000	Bills Receivable	120,000
Debtors	300,000	Bills Payable	25,000
Opening Stock	90,000	Electricity	16,000
Machinery	600,000	wages	14,000
Furniture	100,000	Commission (cr)	40,000

Adjustments:

i) Closing stock Rs.2,00,000/-

ii) Charge depreciation @ 10% on machinery@ 15 % on furniture.

CODE No.:16BT30102 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC16) Supplementary Examinations July – 2022

FLUID MECHANICS AND HYDRAULIC MACHINERY
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Two large fixed parallel planes are 12mm apart. The space between the surfaces is filled with oil of viscosity 0.972N.s/m². A flat thin plate 0.25sq.m area moves through the oil at a velocity of 0.3m/s. Calculate the drag force i) when the plate is equidistant from both planes and ii) when the thin plate is at a distance of 4mm from one of the plane surfaces.	CO2	7 Marks
	b)	Derive an expression to determine the capillary rise or fall of liquid and if the surface tension at air-water interface is 0.069N/m, what is the pressure difference between inside and outside of an air bubble of diameter 0.009mm.	CO1	7 Marks

(OR)

2	a)	Define hydrostatic law and prove that the pressure intensity at any point of liquid at rest is the same in all directions.	CO1	7 Marks
	b)	Discuss the relationship between absolute pressure, atmospheric pressure and gauge pressure. Given that barometric reading is 760mm of mercury, intensity of pressure is 40kPa. Express the intensity of pressure in S.I units, both gauge and absolute.	CO2	7 Marks

UNIT-II

3	a)	Define velocity potential function and the velocity potential function for a two dimensional flow is $\varphi = x(2y - 1)$. At a point (4, 5) determine the velocity and the value of stream function.	CO2	7 Marks
	b)	State and prove Bernoulli's theorem with limitations.	CO2	7 Marks

(OR)

4	a)	Water flows in a circular pile. At one section the diameter is 0.3m, the static pressure is 260kPa gauge, the velocity is 3m/s and the elevation is 10m above ground level. The elevation at a section downstream is 0m and the pipe diameter is 0.15m. Find the gauge pressure at the downstream section neglecting all losses.	CO5	7 Marks
	b)	A 6m long pipe is inclined at an angle of 20 degrees with the horizontal. The smaller section of the pipe which is at a lower level is of 100mm diameter and the larger section of the pipe is of 300mm diameter. If the pipe is uniformly tapering and the velocity of water at the smaller section is 1.8 m/s, determine the difference of pressures between the two sections.	CO5	7 Marks

UNIT-III

5	a)	Two parallel plates kept 100mm apart have laminar flow of oil between them with a maximum velocity of 1.5m/s. Calculate discharge per meter width, shear stress at the plates, difference in pressure between two points 20m apart and velocity gradient at the plates.	CO2	7 Marks
	b)	Derive an expression for loss head due to friction and list out types of losses.	CO2	7 Marks

(OR)

6	a)	In a pipe of diameter 350mm and length 75m is flowing at a velocity of 2.8m/s. Find the head lost due to friction using Darcy Weisbach formula and Chezy's formula for which C= 55.	CO4	7 Marks
	b)	The diameter of a horizontal pipe which is 300mm is suddenly enlarged to 600mm. The rate of flow of water through this pipe is 0.4 cumec. If the intensity of pressure in the smaller pipe is 125kN/m^2, determine loss of head due to sudden enlargement, intensity of pressure in the larger pipe and power lost due to enlargement.	CO2	7 Marks

UNIT-IV

7	a)	Derive an expression to determine the velocity of flow using Chezy's formula. Calculate the dimensions of the rectangular cross section of an open channel which requires minimum area to convey 10 cumec. The slope being 1 in 1500. Take Manning's N = 0.013	CO2	7 Marks
	b)	Obtain the conditions required for most economical rectangular section. A power canal of trapezoidal section has to be excavated through hard clay at least cost. Determine the dimensions of the channel given, discharge equal to 14 cumec, bed slope 1/2500 and Manning's N = 0.02	CO3	7 Marks

(OR)

8	a)	Derive the necessary conditions required for most economical trapezoidal section. A V shaped open channel of included angle 90 degrees conveys a discharge of 0.05 cumec when the depth of flow at the center is 0.225m. Assuming C = 50 in the Chezy's equation, calculate the slope of the channel.	CO3	7 Marks
	b)	Derive the conditions for maximum discharge and maximum velocity of a circular channel to be most economical. The rate of flow of water through a circular channel of diameter 60cm is 150 litres/sec. Find the slope of the bed of the channel for maximum velocity.	CO3	7 Marks

UNIT-V

9	a)	Classify turbines. Explain work done and efficiency of a Pelton wheel with a neat sketch. A Pelton wheel is receiving water from a penstock with a given head of 510m. One third of the head is lost in friction in the penstock. The rate of flow through the nozzle fitted at the end of the penstock is 2.2 cumec. The angle of deflection of th jet is 165 degrees. Determine power given by water of the runner and hydraulic efficiency of the Pelton wheel. Assume coefficient of velocity as 1.00 and speed ratio as 0.45	CO2	7 Marks
	b)	What are the design aspects of Pelton wheel? A Pelton wheel produces 8000 kW under a head of 130m at a speed of 200 r.p.m. The coefficient of velocity of the nozzle is 0.98, hydraulic efficiency is 87%. Speed ratio is 0.45 and jet diameter is one tenth of the wheel diameter. Find the discharge, diameter of the wheel, diameter and number of jets required and the specific speed. The mechanical efficiency is 75%.	CO3	7 Marks

(OR)

10	a)	Describe Francis turbine components with a neat sketch. The following data is given for a Francis turbine. Net head = 80m, speed = 700 r.p.m, shaft power = 300kW, overall efficiency = 80%, hydraulic efficiency = 90%, flow ratio = 0.2 and breadth ratio = 0.1. The thicknesses of vanes occupy 4% of circumferential area of the runner, velocity of flow is constant at inlet and outlet and discharge is radial at outlet. Determine diameters of runner at inlet and outlet, width of wheel at inlet, guide blade angle and runner vane angles at inlet and outlet.	CO2	7 Marks
	b)	An inward flow reaction turbine has outer and inner diameters of 1m and 0.5m respectively. The breadth at inlet is 15cm and the velocity of flow at inlet and outlet remains to be 3m/s. The wheel runs at a speed of 192 r.p.m. If the guide blades make an angle of 10 degrees to the wheel tangent, find the absolute velocity of water at inlet of the runner, velocity of whirl at inlet, relative velocity at inlet, the runner blade angles, width of runner at outlet and mass of water flowing through the runner per second.	CO2	7 Marks

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC16) Supplementary Examinations July – 2022

MECHANICS OF SOLIDS

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	The following data refer to a mild steel specimen tested in a laboratory. Diameter of the specimen= 20mm Length of the specimen= 250mm Extension under a load of 10 kN= 0.035mm Load at yield point= 120.15 kN Maximum load= 195.50 kN Length of the specimen under failure= 300mm The neck diameter = 15.25mm Determine Young's Modulus, Yield point, Ultimate stress, percentage of elongation and percentage reduction in area.	CO2	7 Marks
	b)	Describe the stress strain relationship for mild steel bar.	CO1	7 Marks
		(OR)		
2	a)	A rod of steel is 20m long at a temperature of 20°C. Find the free expansion of the rod when the temperature rises to 65°C. Find the temperature stress produced i) When the expansion of the rod is prevented ii) When the rod is permitted to expand by 5.8 mm. Take $\alpha = 12 \times 10^{-6}$ per °C and $E = 2 \times 10^{5}$ N/mm²	CO2	7 Marks
	b)	State Poisson's Ratio. Obtain the volumetric strain of a rectangular bar and a cylindrical rod.	CO1	7 Marks

UNIT-II

3		Define point of contraflexure. Determine the maximum shear force and bending moment of a simply supported beam carrying a uniformly distributed load of **w** per unit run over the whole span. Draw SFD and BMD	CO2	14 Marks
		(OR)		
4	a)	Determine the maximum shear force and bending moment of a cantilever beam carrying a uniformly distributed load of w per unit run over the whole span	CO2	10 Marks
	b)	A simply supported beam of 8m span has a central point load of 20kN. Determine the maximum shear force and bending moment. Draw shear force diagram and bending moment diagram	CO2	4 Marks

UNIT-III

5		Derive the maximum shear stress intensity for an I-section	CO1	14 Marks
		(OR)		
6		A masonry chimney having a shape of the frustum of a cone is 25m high. The external diameter at the top and the internal diameter at the bottom is 2m. The chimney is 0.5m thick at the base. If the weight of the chimney is 1800kN, find the uniform horizontal wind pressure that may act per unit projected area of the chimney in order tension at the base may be just avoided	CO5	14 Marks

UNIT-IV

7		What are the assumptions in the theory of pure torsion? Derive the equation of torsion.	CO1	14 Marks

(OR)

8	a)	A closed coil helical spring has mean diameter of 75mm and spring constant of 80kN/m. It has 8 coils. What is the suitable diameter of spring wire if maximum shear stress is not to exceed 250MN/m²? Modulus of rigidity of the spring wire material is 80GN/m². What is the maximum axial load the spring can carry?	CO3	7 Marks
	b)	A helical coil spring is made of round steel wire 6.35mm in diameter. The mean radius of the helix is 31.75mm; number of complete turns is 12. The spring is close coiled. If C=84.36 GN/m², then find: i) The pull required to extend the spring by 25.4 mm and ii) The stress in the wire.	CO4	7 Marks

UNIT-V

9	a)	Explain circumferential stress and longitudinal stress with neat sketch.	CO1	7 Marks
	b)	Calculate the thickness of the metal required for a cast iron main 800 mm in diameter for water at a pressure head of 100m if the maximum permissible tensile stress is 20 MN/m² and weight of water is 10 kN/m³.	CO2	7 Marks

(OR)

10		A thick cylinder shell is of 300mm internal diameter and has to withstand an internal pressure of 30MN/m². If permissible tensile stress of the shell is 150MN/m² and μ= 0.3, calculate the thickness of metal necessary for the cylinder on the basis of following criteria. i) Maximum principal stress. ii) Maximum principal strain. iii) Maximum shear. iv) Maximum strain energy. Neglect the longitudinal direct stress.	CO4	14 Marks

CODE No.: 16BT30202 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC16) Supplementary Examinations July – 2022

ELECTROMAGNETIC FIELDS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	State and explain Coulomb's law in vector form.	CO1	7 Marks
	b)	Determine the electric field intensity produced by a point charge distribution at P(1, 1, 1) caused by four identical 3nC point charges located at A(1, 1, 0), B(-1, 1, 0), C(-1, -1, 0) and D(1, -1, 0).	CO3	7 Marks

(OR)

2	a)	Using Gauss's law, obtain the expression for electric field intensity due to an infinite sheet of charge.	CO4	7 Marks
	b)	An electrostatic field is given by $\bar{E} = -8xy\bar{a}_x - 4x^2\bar{a}_y + \bar{a}_z V/m$. A. charge of 6C is to be moved from B (1, 8, 5) to A (2, 18, 6). Find the work done in each of the following cases. i) The path selected is $y = 3x^2 + z,\ z = x + 4$. ii) The straight line from B to A. Show that work done remains same and is independent of the path selected.	CO3	7 Marks

UNIT-II

3	a)	Derive the expressions for potential and electric field intensity due to a dipole.	CO2	7 Marks
	b)	For the current density $\bar{J} = 10z\sin^2\phi\bar{a}_\rho\ A/m^2$, determine the current through the cylindrical surface $\rho = 2,\ 1 \le z \le 5m$.	CO3	7 Marks

(OR)

4	a)	Explain in detail about polarization effects induced in dielectric due to electric field.	CO1	7 Marks
	b)	The electric field intensity in polystyrene (ε_r=2.55) filling the space between the plates of a parallel plate capacitor is 10kV/m. The distance between the plates is 1.5 mm. Calculate: i) Electric flux density. ii) Polarization. iii) The surface charge density of free charge on the plates. iv) The surface density of polarization charge. v) The potential difference between the plates.	CO3	7 Marks

UNIT-III

5	a)	State and explain Biot-Savart's Law.	CO1	7 Marks
	b)	Determine the current density associated with the magnetic field: $H = 4r\overrightarrow{a_r} + 5\overrightarrow{a_\theta} + \cos\theta\ \overrightarrow{a_\varphi}\ A/m$.	CO3	7 Marks

(OR)

6	a)	State and prove Ampere's circuital law in point form.	CO1	7 Marks
	b)	Given magnetic field strength, $H = \frac{y^2 z}{x}\overrightarrow{a_x} + \frac{0.5y^2z^2}{x^2}\overrightarrow{a_z} A/m$, find the current crossing the square surface at $y = 2m$ bounded by $x = z = 1m$ and $x = z = 2m$.	CO3	7 Marks

UNIT-IV

7	a)	Obtain an expression for force between two differential current elements carrying currents I_1 and I_2.	CO2	7 Marks
	b)	A rectangular coil carrying a current of 5A is placed in the magnetic field $\vec{B} = 0.3(\overrightarrow{a_x} + \overrightarrow{a_y})T$. The coil is lying in the y-z plane and has dimensions 0.8m x 0.4m. Find the torque developed by the coil.	CO3	7 Marks

(OR)

8	a)	Obtain the expression for torque on a current loop placed in a magnetic field.	CO2	7 Marks
	b)	Derive an expression for force per meter length between two straight long parallel current carrying conductors situated in space, separated by a distance 'd' m carrying a steady current of 'I' amperes in the opposite direction. Comment on the nature of force existed in between them.	CO2	7 Marks

UNIT-V

9	a)	State and explain Poynting Theorem.	CO1	7 Marks
	b)	Explain the following with practical examples. i) Motional EMF. ii) Transformer EMF.	CO1	7 Marks

(OR)

10		Write Maxwell's equations for static fields. Explain how they are modified for time varying electric and magnetic fields.	CO1	14 Marks

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC16) Supplementary Examinations July – 2022

SIGNALS, SYSTEMS AND NETWORKS

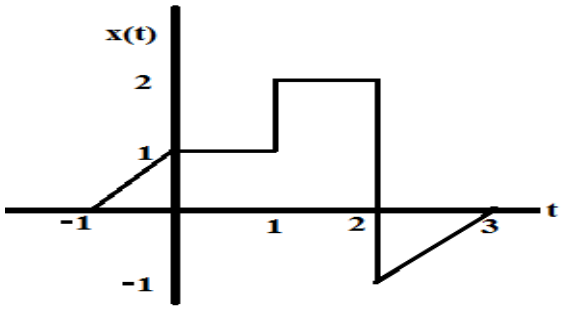
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Investigate whether the following system defined by its impulse response is casual and stable. $h(t) = e^{-3t}u(t-1)$	CO2	7 Marks
	b)	A continuous time signal shown in the Figure, sketch the signal $y(t) = \{x(t) + x(2-t)\}$	CO4	7 Marks



(OR)

2	a)	Verify whether the following system is stable and time invariant. $y(t) = 3\frac{dx(t)}{dt} + 7x(t)$.	CO2	7 Marks
	b)	A system is defined by the differential equation $\frac{d^2y(t)}{dt} + 3\frac{dy(t)}{dt} + 2y(t) = \frac{dx(t)}{dt}$ with initial conditions $y(0) = -1$ and $\left.\frac{dy(t)}{dt}\right\|_{t=0} = 2$ for the input $x(t) = 2e^{-2t}\ u(t)$. Determine the complete response $y(t)$.	CO4	7 Marks

UNIT-II

3	a)	State and prove the frequency shifting and time differentiation properties of Laplace transforms.	CO1	7 Marks
	b)	Obtain the inverse Laplace transforms of the following function $y(s) = \frac{3}{s^2(s+2)(s+3)}$.	CO4	7 Marks

(OR)

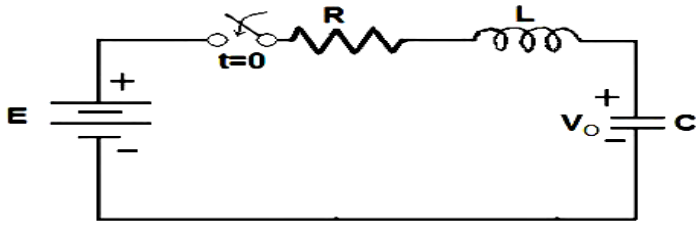
4	a)	Find the energy dissipated by 1 Ohm resistor with $i(t) = 10e^{-2\|t\|}\ A$ in the time and frequency domains using Fourier transforms.	CO5	7 Marks
	b)	Find the Fourier transform of the signal shown in the Figure	CO4	7 Marks

UNIT-III

5	a)	A DC series RLC circuit consists of R=20 Ω, L=0.05 H and C=20 μF with a 100V constant source when the switch is closed at t=0. Find the current transient.	CO4	7 Marks
	b)	In a series RL circuit, the application of a DC voltage results in a current of 0.741 times the final steady state value of current after 1 sec. However, after the current has reached its final value, the source is short circuited. What would be the value of current after one second?	CO4	7 Marks

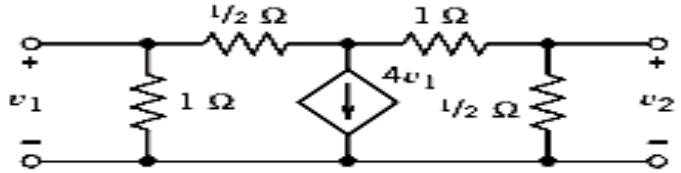
(OR)

6	a)	Explain the transient properties of a capacitor for DC and AC excitations.	CO1	6 Marks
	b)	A step voltage $V(t)$ = 100 u(t) is applied to a series RLC circuit with L = 10H, R=2 Ohm and C= 5F. The initial current in the circuit is zero but there is an initial voltage of 50V on the capacitor in a direction which opposes the applied source. Find the expression for the current in the circuit.	CO4	8 Marks



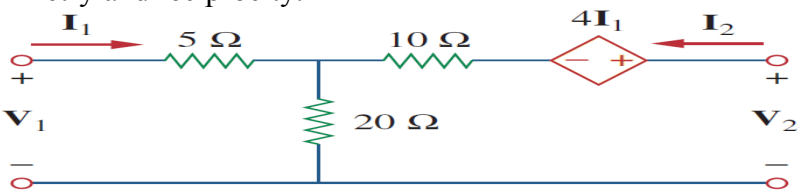
UNIT-IV

7	a)	Define reciprocity and symmetry for a generalized two port network and derive the conditions for reciprocity and symmetry in terms of ABCD parameters.	CO1	6 Marks
	b)	Determine the hybrid parameters for the network shown in Figure. Invistigate the netwok for symmetry and reciprocity.	CO4	8 Marks



(OR)

8	a)	Express hybrid parameters in terms of ABCD parameters for a generalized network.	CO1	6 Marks
	b)	Compute the z parameters of the circuit in Figure. Invistigate the netwok for symmetry and reciprocity.	CO4	8 Marks



UNIT-V

9	a)	Define image impedance and derive its expression for a prototype T networks.	CO2	7 Marks
	b)	A k type Filter circuit is required for a signal analysis purpose, which stops the frequencies ranging between 1 kHz to 10 kHz only and should drive a load of 500 Ω. Justify a suitable filter circuit with proper components and their specifications.	CO6	7 Marks

(OR)

10	a)	Derive the expressions for attenuation and phase shift in pass band and stop band for a symmetrical T section high pass filter.	CO2	7 Marks
	b)	Design an m derived T section low pass filter having cut-off frequency of f_c = 8 kHz, design impedance Ro=600 Ohms and frequency of infinite attenuation f_{inf}=10 kHz.	CO3	7 Marks

CODE No.: 16BT30241 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC16) Supplementary Examinations July – 2022

ELECTRICAL TECHNOLOGY

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the necessity of starter.	CO1	4 Marks
	b)	A 15 kW DC shunt motor has armature and field winding resistance of 0.25Ω and 200Ω respectively. It draws a no-load current of 10 A at a speed of 1200 r.p.m, when connected across a 300 V source. Calculate the speed of the motor at full load. Assume there is no change in flux from no load to full load.	CO4	10 Marks
		(OR)		
2	a)	Mention the applications of DC motors.	CO1	4 Marks
	b)	Derive the expression for torque equation of a DC motor.	CO2	5 Marks
	c)	A 4 pole, lap-wound DC generator has 100 slots and 12 conductors / slot. The flux/pole is 0.5 Wb. Determine the induced e.m.f in the armature if it is rotating at a speed of 1500 r.p.m.	CO4	5 Marks

UNIT-II

3	a)	Define voltage regulation. Derive the expression for voltage regulation of single phase transformer.	CO2	7 Marks
	b)	A 30 kVA single phase transformer has an iron loss of 457 watts and copper loss of 125 watts when delivering half of the full load. At what percentage of full load will the transformer have maximum efficiency?	CO4	7 Marks
		(OR)		
4	a)	Select suitable tests to develop the equivalent circuit of single phase transformer.	CO5	8 Marks
	b)	In a 100 kVA transformer, the iron loss is 1.2 kW and full load copper loss is 2 kW. If the load p.f. is 0.8 lagging, find the efficiency at full load and half of the load.	CO4	6 Marks

UNIT-III

5	a)	Derive expressions of phase and line quantities in delta connected network.	CO2	7 Marks
	b)	Three non reactive resistors of 5Ω, 10Ω and 20Ω are connected to RYB phases of a 440V balanced system. Determine the current and power in each phase, total real power and reactive power.	CO4	7 Marks
		(OR)		
6	a)	Explain how power factor can be calculated by using two wattmeter methods.	CO2	7 Marks
	b)	Calculate the total power input and reading of two wattmeters connected to measure power in a three phase balanced load, if the reactive power input is 15 kVAR and the power factor is 0.8.	CO4	7 Marks

UNIT-IV

7	a)	How alternators are classified? Explain.	CO1	3 Marks
	b)	Derive the e.m.f equation of an alternator.	CO2	5 Marks
	c)	A 3-phase, 16-pole alternator has a star-connected winding with 144 slots and 10 conductors per slot. The flux per pole is 0.03Wb, sinusoidally distributed and the speed is 375 r.p.m. Find the frequency, speed and the phase and line e.m.f. Assume full-pitched coil.	CO4	6 Marks

(OR)

8	a)	Why toque-slip characteristic of a 3-phase Induction motor is rectangular hyperbola? Justify.	CO2	10 Marks
	b)	Compare the slipring and squirrel cage induction motors.	CO1	4 Marks

UNIT-V

9	a)	Why single phase induction motor not self starting? Suggest the means to make it a self starting one.	CO1	7 Marks
	b)	Illustrate the working of split phase induction motor with a phasor diagram.	CO1	7 Marks

(OR)

10	a)	Explain the constructional details of variable reluctance stepper motor.	CO1	7 Marks
	b)	Explain the working of permanent magnet stepper motor and mention its applications.	CO1	7 Marks

CODE No.: 16BT30301 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC16) Supplementary Examinations July – 2022

ENGINEERING METALLURGY
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	List out the various ores of metals.	CO1	5 Marks
	b)	Analyse the process of steel making in L-D process.	CO2	9 Marks
		(OR)		
2		Discuss in detail the working principle of blast furnace.	CO4	14 Marks

UNIT-II

3		What are the different invariant reactions in binary systems? Explain them with neat diagrams.	CO2	14 Marks
		(OR)		
4		Explain in detail the Hume Rothery rules.	CO3	14 Marks

UNIT-III

5	a)	Write the differences between Annealing and Normalizing.	CO3	8 Marks
	b)	Write the purpose of Tempering.	CO3	6 Marks
		(OR)		
6		Explain about TTT Diagram.	CO3	14 Marks

UNIT-IV

7		Explain the following. i) Nitriding. ii) Cyaniding.	CO3	14 Marks
		(OR)		
8		Explain about Scanning Electron Microscope with neat sketch.	CO5	14 Marks

UNIT-V

9	a)	Explain Sintering process.	CO4	7 Marks
	b)	Describe the applications of powder metallurgy.	CO4	7 Marks
		(OR)		
10		Discuss the various methods of producing metal powders and write the limitations of powder metallurgy.	CO6	14 Marks

❀ ❀ ❀

CODE No.: 16BT30304 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC16) Supplementary Examinations July – 2022

STRENGTH OF MATERIALS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Derive the relationship between Modulus of Elasticity, Modulus of Rigidity and Bulk Modulus from first principles.	CO1	7 Marks
	b)	A short reinforced cement concrete column 600mm x 600mm has eight steel rods of diameter 25mm as reinforcement. Find the stresses in steel and concrete, and elastic shortening of column if E = 200000N/mm² for steel and 10000N/mm² for concrete. Load in column is 3000kN and length 3 meters.	CO2	7 Marks

(OR)

2		Rails are laid such that there is no stress in them at 24^{0}C. If the rails are 32m long, determine i) The stress in the rails at 80^{0}C, when there is no allowance for expansion. ii) The stress in the rails at 80^{0}C, when there is an allowance for expansion of 8 mm per rail. iii) The maximum temperature for no stress in the rails when expansion allowance is 8mm Take coefficient of linear expansion is 11 x 10^{-6}/^{o}C and E=205GPa.	CO2	14 Marks

UNIT-II

3		Fig.1 shows vertical forces 20kN, 40kN and UDL of 20kN/m in 3m lengths. Draw the shear force and bending moment diagrams.	CO6	14 Marks

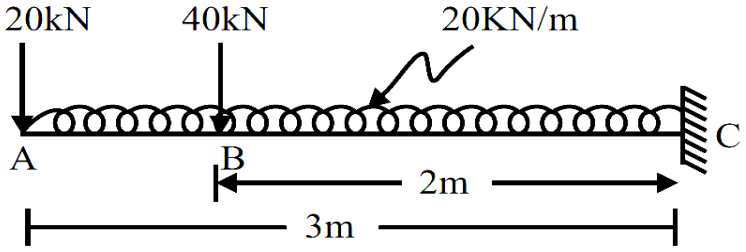


Fig. 1

(OR)

4	a)	Draw the SFD and BMD for the beam shown in the Fig.2.	CO6	7 Marks

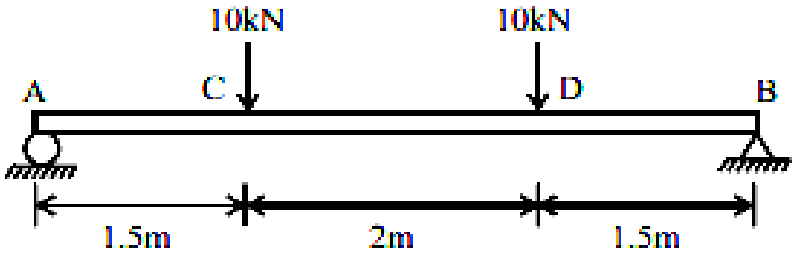


Fig.2

	b)	Derive the relation between shear force, bending moment and rate of loading at a section of a beam.	CO1	7 Marks

UNIT-III

5		A timber beam of rectangular section is to support a load of 20kN uniformly distributed over a span of 3.6 m when beam is simply supported. If the depth of the section is to be twice the breadth and the stress in the timber is not to exceed 7N/mm^2, find the dimensions of the cross section. How would you modify the cross section of the beam, if it carries a concentrated load of 20kN placed at the center with the same ratio of breadth to depth.	CO3	14 Marks

(OR)

6	a)	Derive the expression for shear stress at any point (or in a fibre) in the cross-section of a beam.	CO1	9 Marks
	b)	An equilateral triangular cross section beam with base 250mm is subjected to a shear force of 150kN. Draw the shear stress distribution across the section and also determine the average shear stress.	CO4	5 Marks

UNIT-IV

7		A beam AB of 5 m span is simply supported at ends A and B. C is a point on the beam at a distance of 4m from A. The beam has a moment of inertia of 80 x 10^{6}mm^4 for the length AC and 20 x 10^{6}mm^4 for the length CB. The beam is loaded with a point load of 6 kN at C. Determine the slope at A, deflection at the mid span and maximum deflection. E = 205 GPa.	CO4	14 Marks

(OR)

8	a)	Explain in brief about principal planes and principal stresses.	CO1	6 Marks
	b)	The principal stresses at a point in a bar are 50 MPa tensile and 30 MPa compressive. Calculate the normal stress, shear stress and the resultant stress on a plane inclined at 50^0 to the axis of the major principal stress. Also find the maximum shear stress at the point.	CO5	8 Marks

UNIT-V

9		A thin cylindrical shell of inside diameter 1.5m is made of 10mm thick steel plate. It is of 4m length and is closed at its both ends. The shell is subjected to an internal fluid pressure of 2 MPa. Find the change in length, final length, the change in diameter, the final diameter, the change in volume and the final volume of the cylinder. The modulus of elasticity of steel is 210 GPa and the Poisson's ratio is 0.30.	CO3	14 Marks

(OR)

10		State the assumptions of Lame's theory of thick cylinders. Also derive the equations for radial pressure and hoop stress at any point in case of a thick cylinder.	CO1	14 Marks

CODE No.: 16BT30305 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC16) Supplementary Examinations July – 2022

THERMODYNAMICS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What is the concept of continuum? How will you define density using this concept?	CO1	7 Marks
	b)	To a closed system 150 kJ of work is supplied. If the initial volume is 0.6 m^3 and pressure of the system changes as p = 8 – 4V, where p is in bar and V is in m^3, determine the final volume and pressure of the system.	CO2	7 Marks
		(OR)		
2	a)	Define Path function and point function.	CO1	6 Marks
	b)	A mass of gas is compressed in a quasi-static process from 80 kPa, 0.1m^3 to 0.4 MPa, 0.03m^3. Assuming that the pressure and volume are related by pv^n = constant, find the work done by the gas system.	CO2	8 Marks

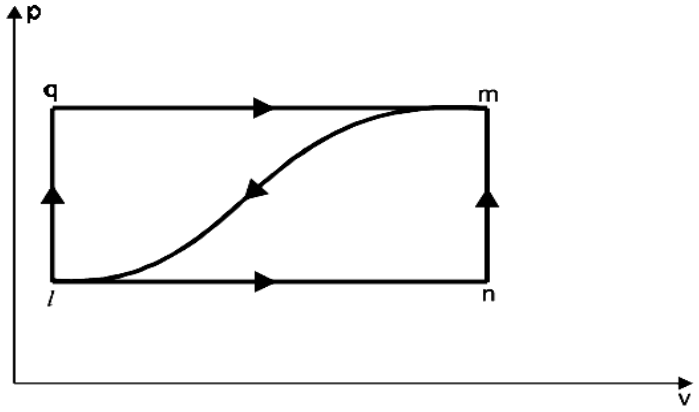
UNIT-II

3	a)	A heat engine is used to drive a heat pump. The heat transfers from the heat engine and from the heat pump are used to heat the water circulating through the radiators of a building. The efficiency of the heat engine is 27% and the COP of the heat pump is 4. Evaluate the ratio of the heat transfer to the circulating water to the heat transfer to the heat engine	CO2	10 Marks
	b)	What is Perpetual motion machine of the first kind?	CO1	4 Marks
		(OR)		
4	a)	Define enthalpy. How is it related to internal energy	CO1	4 Marks
	b)	When a system is taken from state l to state m, in Fig., along path lqm, 168 kJ of heat flows into the system, and the system does 64 kJ of work:	CO2	10 Marks

i) How much will be the heat that flows into the system along path lnm if the work done is 21 kJ?

ii) When the system is returned from m to l along the curved path, the work done on the system is 42 kJ? Does the system absorb or liberate heat, and how much of the heat is absorbed or liberated?

iii) If Ul = 0 and Un = 84 kJ, find the heat absorbed in the processes ln and nm.



UNIT-III

5	a)	Bring out the concept of entropy and importance of T-s diagram.	CO1	4 Marks
	b)	One kg of ice at -50^{0}C is exposed to the atmosphere which is at 200C. The ice melts and comes into thermal equilibrium with the atmosphere. i) Determine the entropy increase of the universe. ii) What is the minimum amount of work necessary to convert the water back into ice at -5 ^{0}C? Cp of ice is 2.093kJ/kg K and the latent heat of fusion of ice is 333.3kJ/kg.	CO3	10 Marks

(OR)

6	a)	State and prove Clausius inequality.	CO1	4 Marks
	b)	An economizer, a gas-to-water finned tube heat exchanger, receives 67.5kg/s of gas, cp = 1.0046 kJ/kg K, and 51.1 kg/s of water, cp = 4.186 kJ/kg K. The water rises in temperature from 402 to 469 K, where the gas falls in temperature from 682 K to 470 K. There are no changes of kinetic energy and $p0$ = 1.03 bar and $T0$ = 289 K. Determine: i) Rate of change of availability of the water. ii) The rate of change of availability of the gas. iii) The rate of entropy generation.	CO4	10 Marks

UNIT-IV

7	a)	Define dryness fraction (or) what is the quality of steam?	CO1	4 Marks
	b)	A sample of steam from a boiler drum at 3 MPa is put through a throttling calorimeter in which the pressure and temperature are found to be 0.1MPa, 120°C. Find the quality of the sample taken from the boiler.	CO4	10 Marks

(OR)

8	a)	Draw the T-S diagram for pure substance and explain.	CO1	4 Marks
	b)	A vessel having a capacity of 0.05m^3 contains a mixture of saturated water and saturated steam at a temperature of 245°C. The mass of the liquid present is 10 kg. Find the following : i) The pressure. ii) The mass. iii) The specific volume. iv) The specific enthalpy, v) The specific entropy. vi) The specific internal energy.	CO4	10 Marks

UNIT-V

9	a)	Compare with the help of P-V and T-S diagram air standard Otto, Diesel and Dual cycles with respect to: i) Same compression ratio and same heat input. ii) Same maximum pressure and same heat input.	CO1	6 Marks
	b)	A Diesel engine has a compression ratio of 14 and cut-off takes place at 6% of the stroke. Find the air standard efficiency.	CO5	8 Marks

(OR)

10	a)	Draw the P-V and T-S diagram of Stirling, Atikinson and Erricson cycle.	CO1	6 Marks
	b)	A perfect gas undergoes a cycle which consists of the following processes taken in order: i) Heat rejection at constant pressure. ii) Adiabatic compression from 1 bar and 270C to 4 bars. iii) Heat addition at constant volume to a final pressure of 16 bars. iv) Adiabatic expansion to 1 bar. Calculate: i) Work done/kg of gas; ii) Efficiency of the cycle. Take: cp = 0.92kJ/kg.K, cv= 0.75 Kj/kg	CO5	8 Marks

CODE No.: 16BT30401 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC16) Supplementary Examinations July – 2022

ELECTRONIC CIRCUIT ANALYSIS AND DESIGN

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain CE amplifier with neat circuit diagram	CO1	7 Marks
	b)	What are the transistors configurations need to select to configure a Cascode Amplifier? Explain.	CO3	7 Marks
		(OR)		
2	a)	Derive expressions for overall voltage gain of a two-stage RC coupled amplifier.	CO3	8 Marks
	b)	Select a BJT amplifier among CE, CB and CC, explain its operation.	CO5	6 Marks

UNIT-II

3	a)	Explain how hybrid-Π parameters vary with Ic, Vce and Temperature.	CO1	7 Marks
	b)	A transistor amplifier in CE configuration is operating at high frequency with the following specifications: f_T = 6 MHz, g_m= 0.04 mhos, hfe= 50, rbb_0= 100Ω, Rs = 500Ω, CC = 10pF, R_L= 100Ω. Compute the voltage gain, upper 3dB cut off frequency and gain bandwidth product.	CO4	7 Marks
		(OR)		
4	a)	Explain about emitter follower at high frequencies.	CO1	7 Marks
	b)	Three identical non-interacting amplifier stages have an overall gain of 0.3 dB down at 20 kHz compared to mid band gain. Calculate the uppercut-off frequencies of the individual stages.	CO4	7 Marks

UNIT-III

5	a)	State and explain the Barkhausen's criterion for Oscillations.	CO1	7 Marks
	b)	Draw the Colpitts oscillator with BJT, explain its operation and derive an expression for frequency of oscillations	CO3	7 Marks
		(OR)		
6	a)	Derive the expression voltage gain of current series feedback amplifier	CO3	7 Marks
	b)	Draw the equivalent circuit of a Quartz Crystal.	CO1	7 Marks

UNIT-IV

7	a)	State the merits of push pull configuration? Describe the operation of class B transformer coupled push pull amplifier.	CO1	7 Marks
	b)	Derive an expression for Total Power Dissipation in a Power Amplifier.	CO2	7 Marks
		(OR)		
8	a)	What are the drawbacks of transformer coupled power amplifiers?	CO1	7 Marks
	b)	Derive the expression for maximum conversion efficiency for a simple series fed Class A power amplifier.	CO2	7 Marks

UNIT-V

9	a)	Why two tuned circuits are used in double tuned amplifier? Explain clearly.	CO1	7 Marks
	b)	Apply tuned amplifiers in the radio frequency range applications for tuning ratio frequency.	CO6	7 Marks
		(OR)		
10	a)	What is the effect of cascading single tuned amplifiers on bandwidth?	CO1	7 Marks
	b)	Apply transformer coupling to construct double tuned amplifier. Explain briefly about double tuned amplifier.	CO6	7 Marks

❀ ❀ ❀

CODE No.: 16BT30402 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC16) Supplementary Examinations July – 2022

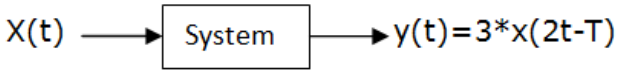
SIGNALS AND SYSTEMS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

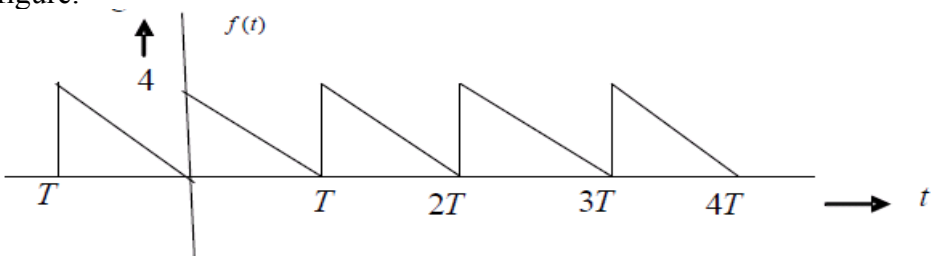
1	a)	List the following properties of systems. i) Stability. ii) Linearity. iii) Causality.	CO1	7 Marks
	b)	Sketch r(t)+r(t-1)+r(t-2)+r(t-3).	CO2	7 Marks
		(OR)		
2	a)	Sketch the bounded and unbounded signals and check whether system $h(t)=e^{3t}$ is stable or not	CO1	7 Marks
	b)	Consider the system below	CO2	7 Marks



If the signal x(t) has an energy E then what is the energy of y(t) signal.

UNIT-II

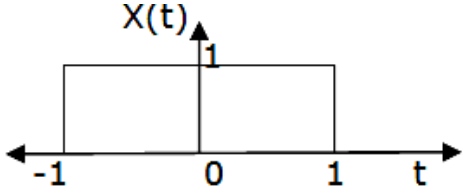
3	a)	Find the trigonometric Fourier series of the waveform as shown in the figure.	CO4	10 Marks



	b)	Examine the conditions required for existence of Fourier transform.	CO2	4 Marks
		(OR)		
4	a)	Find out the Fourier Transform of the Cosine wave x(t) = A Cos (2πfct) u(t). Hence plot its amplitude spectrum	CO4	8 Marks
	b)	Summarize the types of distortions in linear systems and examine how should be the amplitude of distortion less system.	CO2	6 Marks

UNIT-III

5	a)	Determine the energy spectral density of gate function with an amplitude A and pulse width τ.	CO4	7 Marks
	b)	Using appropriate method find the convolution of the rectangular pulse given below with itself.	CO5	7 Marks



(OR)

6	a)	Find the step response of the system whose impulse response is given by: $h(t)=e^{-3t}u(t) - e^{-2t}u(t)$	CO4	7 Marks
	b)	By applying appropriate technique find the response y(t) of an LTI system whose input and impulse response is given by: $x(t)=3\cos 2t$ for all t. $h(t) = e^{-\lvert t\rvert}\begin{cases} e^{t} & t < 0 \\ e^{-t} & t \geq 0 \end{cases}$	CO5	7 Marks

UNIT-IV

7	a)	Explain the significance of Laplace transform in designing real time systems to meet human requirements	CO6	7 Marks
	b)	Find Laplace Transform of the signal $X(t)=e^{-b\lvert t\rvert}$	CO3	7 Marks
		(OR)		
8	a)	Explain how laplace transform is useful to analyse the stability of systems in s domain.	CO6	7 Marks
	b)	Using convolution theorem for laplace transform find $y(t)=x_1(t)*x_2(t)$ where $x_1(t)=e^{-3t}u(t)$ and $x_2(t)=u(t-2)$	CO3	7 Marks

UNIT-V

9	a)	Given a signal $x(t) = 3\cos(50\pi t) \cdot 10\sin(300\pi t) \cdot \cos(100\pi t)$. Find the Nyquist rate for this signal.	CO4	9 Marks
	b)	What is aliasing and anti aliasing? What are the causes to it and how it can be eliminated?	CO3	5 Marks
		(OR)		
10	a)	Find the Z-transform of $x[n] = (1/2)^n u[n] + (1/3)^n u[-n-1]$.	CO4	8 Marks
	b)	Derive the Convolution theorem and scaling property of Z-transform.	CO1	6 Marks

CODE No.: 16BT30403 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC16) Supplementary Examinations July – 2022

SWITCHING THEORY AND LOGIC DESIGN

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the properties of EX-OR gate.	CO1	7 Marks
	b)	Realize the Boolean expression [[(A+B) C]' D] using NAND gate.	CO3	7 Marks
		(OR)		
2	a)	Explain about Boolean Laws and Theorems.	CO1	7 Marks
	b)	Express the binary word 1011 in terms of seven bit even parity hamming code.	CO3	7 Marks

UNIT-II

3	a)	Obtain the expression for the function "F" with minimum number of literals using tabulation method. F(A, B, C, D, E) =∑m(1, 4, 6, 10, 20, 22, 24, 26).	CO4	10 Marks
	b)	Reduce the following function using K-map F(A, B, C, D, E) = ∑m (1, 4, 6, 10).	CO5	4 Marks
		(OR)		
4	a)	Reduce the following function using K-map F(A, B, C, D) = ΠM(0, 2, 3, 8, 9, 12, 13, 15).	CO5	7 Marks
	b)	Obtain the simplified expression in sum of products F(A, B, C, D)= Σm(1, 2, 4, 11, 12, 13) +d (0, 3, 6, 10).	CO4	7 Marks

UNIT-III

5	a)	Explain 1-line to 8-line de-multiplexer with an example.	CO1	7 Marks
	b)	Distinguish between an encoder and decoder.	CO2	7 Marks
		(OR)		
6	a)	Explain 1-line to 4-line de-multiplexer with an example.	CO1	7 Marks
	b)	Implement the following function with a MUX**:** F(A, B, C)=∑*m*(1, 3, 5, 6).	CO2	7 Marks

UNIT-IV

7	a)	Draw the truth and excitation tables for all flip flops.	CO6	7 Marks
	b)	Design Mod-10 Counter using T Flip-Flops.	CO3	7 Marks
		(OR)		
8	a)	Design a sequential circuit with two D flip-flops A and B. and one input X. when X=0, the state of the circuit remains the same. When X=1, the circuit goes through the state transition from 00 to 11 to 11 to 10 back to 00.and repeats?	CO6	7 Marks
	b)	Design of a synchronous BCD up counter using T Flip-Flop.	CO3	7 Marks

UNIT-V

9	a)	Distinguish between PROM ,PLA and PAL.	CO1	7 Marks
	b)	Implement the following Boolean functions using PLA. W(A,B,C,D) = Σm(0, 2, 6, 7, 8, 9, 12, 13), X(A,B,C,D) = Σm(0, 2, 6, 7, 8, 9, 12, 13, 14).	CO2	7 Marks
		(OR)		
10	a)	Distinguish between Moore and Mealy machine.	CO1	7 Marks
	b)	Design a combinational circuit using a PROM. The circuit accepts a 3-bit binary number and generates its equivalentXS-3 code.	CO6	7 Marks

❀ ❀ ❀

CODE No.: 16BT30441 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC16) Supplementary Examinations July – 2022

ANALOG ELECTRONIC CIRCUITS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Implement different types of coupling methods in multistage amplifiers. And explain their Frequency response.	CO6	8 Marks
	b)	With the help of circuit diagram and its ac equivalent circuit develop expression for the overall input impedance of emitter follower circuit.	CO3	6 Marks
		OR)		
2	a)	Draw and explain the CE Hybrid - Pi model.	CO2	7 Marks
	b)	Apply cascading concept to get high voltage gain.	CO6	7 Marks
		UNIT-II		
3	a)	Give the two Barkhausen conditions required in order for sinusoidal oscillations to be sustained.	CO1	8 Marks
	b)	Compare Hartley and Colpitts oscillator.	CO2	6 Marks
		(OR)		
4	a)	Define Piezoelectric effect. Draw an ac equivalent circuit of a Crystal.	CO1	6 Marks
	b)	Compare RC and LC oscillators.	CO2	8 Marks
		UNIT-III		
5	a)	A push pull amplifier utilizes a transformer whose primary has a total of 160 turns and whose secondary has 40 turns. It must be capable of delivering 40W to an 8 Ω load under maximum power conditions	CO4	7 Marks
	b)	What is cross over distortion? How can it be eliminated in case of a transformer coupled class- B push pull power amplifier? Explain with a neat circuit diagram.	CO1	7 Marks
		(OR)		
6	a)	A class-B push pull power amplifier drives a load of 16Ω connected to the secondary of an ideal transformer. If the number of turns on the primary is 200 and that on the secondary is 50, calculate the maximum power output, dc power input, efficiency and maximum power dissipated per transistor if the supply voltage is 25Volts.	CO4	8 Marks
	b)	What are the drawbacks of transformer coupled power amplifiers?	CO1	6 Marks
		UNIT-IV		
7	a)	Discuss the operation of a low-pass circuit when it is excited by a sinusoidal signal.	CO1	7 Marks
	b)	Design a two independent level clipper for a sine wave of 10V(P-P). Assume (VR1 = 5v, VR2 = 3v).	CO3	7 Marks
		(OR)		
8	a)	Design a two independent level clipper for a sine wave of 20 V(P-P). Assume (VR1 = -VR2).	CO3	7 Marks
	b)	Define the term Rise time with necessary expression.	CO1	7 Marks

UNIT-V

9	a)	List the applications of astable multivibrator.	CO2	7 Marks
	b)	Apply appropriate technique to convert voltage to frequency, using two transistors.	CO5	7 Marks

(OR)

10	a)	Apply appropriate technique to convert any signal to square signal, using two transistors and deduct necessary expressions.	CO5	8 Marks
	b)	List the applications of Bi-stable multi-vibrator.	CO2	6 Marks

CODE No.: 16BT30501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC16) Supplementary Examinations July – 2022

COMPUTER ORGANIZATION

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain about sign magnitude and 2's complement approaches for representing the fixed-point numbers. Why 2's complement representation is preferable?	CO1	7 Marks
	b)	The following register transfer statements specify a memory. Analyze the memory operation in each case. i) R2 ← M[AR]. ii) M[AR] ← R3. iii) R5 ← M[R5].	CO2	7 Marks
		(OR)		
2	a)	What are the different types of Shift operations? Design a 4-bit combinational circuit shifter.	CO1, CO3	7 Marks
	b)	Design a 4-bit Binary Adder-Subtractor circuit.	CO3	7 Marks

UNIT-II

3	a)	Define Control memory. Describe the micro programmed control organization with the help of a diagram.	CO1	7 Marks
	b)	List the three types of Basic computer instructions and specify their respective formats in detail.	CO1	7 Marks
		(OR)		
4	a)	How do you map a computer instruction to a microinstruction address? Explain.	CO1	7 Marks
	b)	Use the mapping procedure, find the microinstruction address for the following operation codes i) 0010. ii) 1011.	CO2	7 Marks

UNIT-III

5	a)	Explain the use of DMA controllers in a computer system with a neat diagram.	CO1	7 Marks
	b)	Design parallel priority interrupt hardware for a system with eight interrupt sources.	CO3	7 Marks
		(OR)		
6	a)	Differentiate between Isolated I/O and Memory Mapped I/O techniques.	CO2	7 Marks
	b)	Explain in detail the CPU-IOP Communication process with the help of a neat diagram.	CO1	7 Marks

UNIT-IV

7	a)	Explain how SIMMs and DIMMs provide for future extension of memory in computer systems.	CO6	7 Marks
	b)	Consider a cache of 128 blocks of 16 words each, for a total of 2048 (2K) words. Assume that the main memory is addressable y a 16-bit address. The main memory has 64K words, viewed as 4K blocks of 16 words each. Assuming direct mapping function, how many bits are there in the main memory address. How many bits does TAG, SET and WORD fields constitute of?	CO2, CO5	7 Marks
		(OR)		

8	a)	Explain the Optical Disk Technologies in detail.	CO1	7 Marks
	b)	Compare SDRAM and DDR-SDRAM.	CO2	7 Marks

UNIT-V

9	a)	Distinguish between tightly coupled multiprocessors and loosely coupled multiprocessors.	CO2	7 Marks
	b)	Consider 8 processors P0 and P7. Consider memory module with 8 words. Design Omega Switching Network to connect processors with memory using 2x2 switches.	CO2, CO5	7 Marks

(OR)

10	a)	Explain pipelining concept in detail.	CO1	7 Marks
	b)	Write short notes on shared memory multiprocessors.	CO1	7 Marks

CODE No.: 16BT30503 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC16) Supplementary Examinations July – 2022

PYTHON PROGRAMMING
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Elaborate how input can be accepted by the user and display the output on the console screen.	CO4	7 Marks
	b)	Outline the operator precedence and associativity in evaluating the expression.	CO3	7 Marks
		(OR)		
2		List Operators in python, explain with an examples.	CO1	14 Marks
		UNIT-II		
3		Write a python script to print fallowing pattern. 5 5 4 5 4 3 5 4 3 2 5 4 3 2 1	CO2	14 Marks
		(OR)		
4	a)	What is a Dictionary? Summarize Dictionary types in Python.	CO1	7 Marks
	b)	Explain Set data types in Python.	CO1	7 Marks
		UNIT-III		
5	a)	List out various String Methods used in Python.	CO1	7 Marks
	b)	Implement Towers of Hanoi problem using Recursion.	CO3	7 Marks
		(OR)		
6	a)	Implement a Python code that determines how many times a given letter occurs in a given string using Recursion.	CO4	7 Marks
	b)	Write a program segment that: i) Opens and reads a text file. ii) Copy data to other file.	CO6	7 Marks
		UNIT-IV		
7		Explain encapsulation, inheritance and polymorphism.	CO1	14 Marks
		(OR)		
8		Develop a simple program for bouncing ball using multiple turtles.	CO4	14 Marks
		UNIT-V		
9		How to reuse a GUI component with class. And explain about Attaching and Extending class components.	CO2	14 Marks
		(OR)		
10	a)	List and explain the uses of Lambda.	CO2	7 Marks
	b)	Compare and contrast between radio buttons with check boxes in GUI programming of python.	CO2	7 Marks

❀ ❀ ❀

CODE No.: 16BT31201 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC16) Supplementary Examinations July – 2022

DISCRETE MATHEMATICAL STRUCTURES
[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Determine symbolic form and establish the validity of the following arguments. " If I get my Christmas bonus AND my friends are free , I will take a road trip with my friends. If my friends don't find a job after Christmas, Then they will be free. I got my Christmas bonus and my friends did NOT find a job after Christmas." Therefore I will take a road trip with my friends.	CO4	7 Marks
	b)	Construct the converse, inverse and contrapositive of the statement: "If the flood destroy my house or the fires destroy my house, then my insurance company will pay me".	CO3	7 Marks

(OR)

2	a)	What is the correct conclusion for the following: Given the following statements as premises, all referring to an arbitrary meal: If he takes coffee, he does not drink milk. He eats crackers only if he drinks milk. He does not take soup unless he eats crackers. At noon today, he had coffee. Whether he took soup at noon today?	CO1	7 Marks
	b)	Organize the following statement in symbolic form using quantifiers: i) All students have taken a course in mathematics. ii) Some students are intelligent, but not hardworking.	CO3	7 Marks

UNIT-II

3	a)	Show that the function f and g both of which are from N to N given by $f(x,y) = x + y$ and $g(x, y)=XY$ are onto but not one-one.	CO1	7 Marks
	b)	Define Lattice. List all its properties.	CO1	7 Marks

(OR)

4	a)	Show that a relation R defined on the set of real numbers as (a, b) R (c, d) if $a^2 + b^2 = c^2 + d^2$. Show that R is an equivalence relation.	CO1	7 Marks
	b)	What do mean by Hasse diagram. Illustrate it with an example.	CO1	7 Marks

UNIT-III

5	a)	Distinguish between semi group and subgroup with example.	CO2	7 Marks
	b)	Demonstrate Lagrange's theorem with an example.	CO1	7 Marks

(OR)

6	a)	Define a group. Let S = {0, 1, 2, 3, 4, 5, 6, 7} and * denote "multiplication modulo 8 i.e. x mod y, y mod 8 .	CO1	7 Marks
	b)	Show that the additive group Z_4 is isomorphic to the multiplicative groups of non zero element of Z_5.	CO2	7 Marks

UNIT-IV

7	a)	Determine the generating function of the following numeric function. $a_n = 2^n$, if n is even $= -2^n$, if n is odd	CO4	7 Marks
	b)	Solve $a_n - 2\,a_{n-1} - 3\,a_{n-2} = 0$, n$\in$ N, with initial conditions $a_0 = 3$, $a_1 = 1$.	CO3	7 Marks

(OR)

8	a)	Find the number of ways that 9 students can be seated in the room so that there is at least one student in each of the five rows.	CO1	7 Marks
	b)	Solve $a_{n+2} - 2\,a_{n+1} + a_n = 2^n$ with initial conditions $a_0 = 2$, $a_1 = 1$.	CO3	4 Marks
	c)	Find the recurrence relation with initial condition for the following: 2, 10, 50, 250, …….	CO1	3 Marks

UNIT-V

9	a)	Prove that the chromatic number of a tree is always 2 and chromatic polynomial is $\lambda(\lambda-1)^{n-1}$.	CO4	7 Marks
	b)	What do you mean by graph isomorphism, show it by an example.	CO1	7 Marks

(OR)

10	a)	Prove these are equivalent. i) A graph G is 2-colorable. ii) G is bipartite.	CO4	7 Marks
	b)	Prove that if the graph has **n** vertices and vertex '**u**' is connected to vertex '**w**' then there exist a path from **u** to **w** of length no more than **n**.	CO4	7 Marks

CODE No.: 16BT31501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC16) Supplementary Examinations July – 2022

OPERATING SYSTEMS

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain process states with state transition diagram.	CO1	7 Marks
	b)	With a neat sketch, explain about Process Control Block (PCB).	CO1	7 Marks
		(OR)		
2	a)	Define an operating system. What is system's viewpoint of an operating system?	CO1	7 Marks
	b)	Explain the dual mode operation of an operating system.	CO1	7 Marks

UNIT-II

3		Consider a system containing m resources of the same type being shared by n processes. Resources can be requested and released by processes only one at a time. Show that the system is deadlock free if the following two conditions hold: i) The maximum need of each process is between 1 and *m* resources ii) The sum of all maximum needs is less than *m* * *n*.	CO3	14 Marks
		(OR)		
4	a)	What do you mean by a binary semaphore and counting semaphore?	CO2	7 Marks
	b)	Explain the implementation of wait( ) and signal( ) semaphore operations.	CO2	7 Marks

UNIT-III

5	a)	Distinguish between page table and inverted page table with appropriate examples.	CO2	7 Marks
	b)	Explain the benefits of a virtual memory system.	CO2	7 Marks
		(OR)		
6	a)	For the following page reference calculate the page faults that occur using LFU and MFU for 3 and 4 page frames respectively 0, 4, 3, 2, 4, 0, 3, 5, 1, 3, 2, 1, 5.	CO2	7 Marks
	b)	What are the contents of a page table? Explain how a page table relates pages and frames.	CO2	7 Marks

UNIT-IV

7	a)	Discuss the most common schemes for defining the logical structure of a directory.	CO2	7 Marks
	b)	Explain about tertiary storage structure.	CO2	7 Marks
		(OR)		
8	a)	List the various layers of a file system.	CO1	7 Marks
	b)	What are the various disk scheduling algorithms? Explain any two of the disk scheduling algorithms.	CO1	7 Marks

UNIT-V

9	a)	Was the lifecycle of an I/O request does not require many CPU cycles? Justify.	CO5	7 Marks
	b)	Explain about revocation of access rights.	CO5	7 Marks
		(OR)		
10	a)	Explain about Transforming I/O Requests to Hardware Operations.	CO5	7 Marks
	b)	Explain the need of I/O protection.	CO5	7 Marks

❀ ❀ ❀

CODE No.: 16BT50502 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC16) Supplementary Examinations July – 2022

LINUX PROGRAMMING
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Write a linux program to display environment variable.	CO3	7 Marks
	b)	Compare getopt and getopt-long system calls.	CO2	7 Marks
		(OR)		
2	a)	Construct a program to access environment variables using putenv and getenv function.	CO3	7 Marks
	b)	Explain how linux operating system provides more security than any other.	CO1	7 Marks
		UNIT-II		
3	a)	Explain control structures of shell programming with suitable examples.	CO1	10 Marks
	b)	Write short notes on shell script arguments.	CO3	4 Marks
		(OR)		
4	a)	Illustrate with example the process of creation and execution of shell script.	CO5	7 Marks
	b)	Write a short note on **I/O Redirection** operators.	CO3	7 Marks
		UNIT-III		
5	a)	Write a shell program the first 128 bytes of the standard input to standard output.	CO3	7 Marks
	b)	Differentiate the system calls unlink, link and symlink.	CO2	7 Marks
		(OR)		
6	a)	Write a shell program to copy the contents from one file to another file character by character.	CO3	6 Marks
	b)	Discuss the system calls: i) chmod. ii) chown. iii) mkdir and rmdir. iv) chdir and getcwd.	CO1	8 Marks
		UNIT-IV		
7	a)	Discuss wait and sleep command with example.	CO1	7 Marks
	b)	Illustrate the need for sigaction function. Give example.	CO5	7 Marks
		(OR)		
8	a)	Discuss the advantages and drawbacks of using threads.	CO1	4 Marks
	b)	Develop linux based application using threads.	CO6	10 Marks
		UNIT-V		
9	a)	Define pipe and specify the usage of popen and pclose commands.	CO1	7 Marks
	b)	Develop a program that sends output to an external program.	CO3	7 Marks
		(OR)		
10	a)	Design a program that reads all the data from pipe.	CO4	4 Marks
	b)	Illustrate with example the usage of pipes across fork.	CO5	10 Marks

❀ ❀ ❀

CODE No.: 19BT3BS01 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

NUMERICAL METHODS, PROBABILITY AND STATISTICS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Find the positive root of the equation $2x - \log_{10} x = 7$, by Regula-Falsi method. — 6 Marks L3 CO1 PO1

   b) Find the root of the equation x sin **x + cos x = 0** using Newton-Raphson method. — 6 Marks L3 CO1 PO2

(OR)

2. a) Apply Newton's forward formula, find the value of $f(1.6)$, if — 6 Marks L3 CO1 PO2

x	1	1.4	1.8	2.2
f(x)	3.49	4.82	5.96	6.5

   b) Apply Lagrange's interpolation formula to find the value of y when x = 9, if the following values of x and y are given: — 6 Marks L3 CO1 PO1

x	5	7	11	13	17
y	150	392	1452	2366	5202

UNIT-II

3. a) Find the first and second derivatives at $x = 1.1$ if — 6 Marks L1 CO1 PO2

x	1.0	1.2	1.4	1.6	1.8	2.0
f(x)	0	0.128	0.544	1.296	2.432	4.000

   b) Evaluate $\int_0^6 \frac{1}{1+x^2}\,dx$ by using Simpson's $\frac{3}{8}$ rule. — 6 Marks L3 CO1 PO1

(OR)

4. a) Apply the Taylor's series method, solve $\frac{dy}{dx} = x - y^2,\ y(0) = 1\ at\ x = 0.1\ and\ x = 0.2$. — 6 Marks L3 CO1 PO1

   b) Apply the fourth order R-K method, solve $\frac{dy}{dx} = xy,\ y(0) = 1\ at\ x = 0.2\ (take\ h = 0.2)$. — 6 Marks L3 CO1 PO1

UNIT-III

5. a) For the discrete probability distribution — 6 Marks L1 CO2 PO2

x	**0**	**1**	**2**	**3**	**4**	**5**	**6**
P(x)	**0**	**2k**	**2k**	**3k**	**k^2**	**$2k^2$**	**$7k^2+k$**

Find the value of k, mean and variance.

   b) Suppose a continuous random variable X has the probability density function $f(x) = \begin{cases} k(1 - x^2), when\ 0 < x < 1 \\ 0,\ else\ where \end{cases}$ then find the value of k, mean and variance of the distribution. — 6 Marks L2 CO2 PO1

(OR)

6.	a)	The discrete random variable denotes the number of heads in a single toss of 3 fair coins. Determine $P(x < 3)$ and $P(1 < x < 3)$.	6 Marks	L1	CO2	PO1
	b)	Find the constant k such that $f(x) = \begin{cases} kx^2, when\ 0 \le x \le 3 \\ 0, \ else\ where \end{cases}$ is a probability function and find $P(1 \le x \le 2)$.	6 Marks	L2	CO2	PO1

UNIT-IV

7.	a)	30% of the items from a factory are defective. Find the probability that in a sample of 8 chosen at random. i) one is defective. ii) at least five are defective.	6 Marks	L1	CO2	PO2
	b)	A certain area of the eastern United States is, on average, hit by 6 hurricanes a year. Find the probability that in a given year that area will be hit by fewer than 4 hurricanes and anywhere from 6 to 8 hurricanes.	6 Marks	L2	CO2	PO1

(OR)

8.	a)	In a Photographic process, the time to process 8 X 10 prints from a memory card may be looked upon as a random variable having the normal distribution with a mean of 10.28 seconds and a standard deviation of 0.12 second. Find the probability that it will take: i) Anywhere from 10.00 to 10.50 seconds to process one of the prints, ii) At least 10.20 seconds to process one of the prints.	6 Marks	L3	CO2	PO2
	b)	Suppose that a study of a certain computer system reveals that the response time, in seconds, has an exponential distribution with a mean of 3 seconds. i) What is the probability that response time exceeds 5 seconds? ii) What is the probability that response time is less than 10 seconds?	6 Marks	L2	CO2	PO1

UNIT-V

9.	a)	A sample of 400 items are taken from a population whose standard deviation is 10. The mean of the sample is 40. Test whether the sample has come from a population with mean 38. Also calculate 95% confidence interval for the population.	6 Marks	L3	CO2	PO4
	b)	In a big city 325 men out of 600 men were found to be smokers. Does this information support the conclusion that the majority of men in this city are smokers?	6 Marks	L3	CO2	PO4

(OR)

10.	a)	A random sample of six steel beams has a compressive strength of 58,392 p.s.i (pounds per square inch) with a standard deviation of 648 p.s.i. Use this information and the level of significance 0.05 to test whether the true average compressive strength of the steel from which this sample came is 58,000 p.s.i. Assume normality.	6 Marks	L3	CO2	PO4
	b)	1000 students at college level were graded according to their I.Q and the economic conditions of their home. Use Chi-square test to find out whether there is any association between condition at home and I.Q at 0.05 level of significance.	6 Marks	L3	CO2	PO4

Economic condition	High	Low
Rich	460	140
Poor	240	160

CODE No.: 19BT3BS02 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

SPECIAL FUNCTIONS AND COMPLEX ANALYSIS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define gamma function and express $\int_0^\infty x^{p-1}\ e^{-kx}\ dx\ (k>0)$ in terms of gamma function.	6 Marks	L1	CO1	PO1
	b)	Prove that $\beta\left(m,\frac{1}{2}\right) = 2^{2m-1}\beta\ (m,m)$.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Show that $\int_a^b (x-a)^{m-1}(b-x)^{n-1}\ dx = (b-a)^{m+n-1}\beta\ (m,n)$.	6 Marks	L2	CO1	PO1
	b)	Prove that $\int_0^1 x^3\left(1-\sqrt{x}\right)^5\ dx = 2\beta\ (8,6)$.	6 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Express $\mathbf{J_5(x)}$ in terms of $\mathbf{J_0(x)}$ and $\mathbf{J_1(x)}$.	6 Marks	L3	CO1	PO1
	b)	Show that $\mathbf{(n+1)\ P_{n+1}(x) = (2n+1)\ x\ P_n(x) - n\ P_{n-1}(x)}$.	6 Marks	L2	CO1	PO1
		(OR)				
4.	a)	Show that $J_{\frac{1}{2}}(x) = \sqrt{\frac{2}{\pi x}}\ \sin x$.	6 Marks	L2	CO2	PO2
	b)	Prove that $P_n\ (x) = \frac{1}{2^n\ n!}\ \frac{d^n}{dx^n}\left(x^2-1\right)^n$.	6 Marks	L2	CO1	PO1

UNIT-III

5.	a)	Define analytic function and construct the analytic function $f(z) = u + iv$ where $u = e^{x^2-y^2}\cos 2xy$.	6 Marks	L3	CO3	PO2
	b)	Discuss the transformation $W = \sqrt{z}$. Is it Conformal at the Origin?	6 Marks	L2	CO2	PO1
		(OR)				
6.	a)	Find the analytic function f(z) = u + iv if $2u + v = e^x\ (\cos y - \sin y)$.	6 Marks	L3	CO2	PO2
	b)	Find the bilinear transformation which maps the points **z = 1 , i , -1** on to the points **w = i , 0,-i.**	6 Marks	L2	CO2	PO2

UNIT-IV

7.		Write Cauchy's integral formula and evaluate $\int_C \frac{Sin^2 z}{\left(z-\frac{\pi}{6}\right)^3}\ dz$ where C is the Circle |z| = 1.	12 Marks	L2	CO2	PO2
		(OR)				

8.	a)	Evaluate f (2) and f (3) where $f(a) = \int_C \frac{2z^2 - z - 2}{z - a}\, dz$ and C is the Circle |z| = 2.5.	6 Marks	L3	CO2	PO2
	b)	Expand $f(z) = \frac{z-1}{z+1}$ in Taylor's series about the Point z =1 .	6 Marks	L2	CO2	PO1

UNIT-V

9.	a)	Write Residue theorem and evaluate $\int_C \frac{1-2z}{z(z-1)(z-2)}\, dz$ where C is the circle |z| =1.5 by Residue theorem.	6 Marks	L2	CO2	PO1
	b)	Evaluate $\int_0^\infty \frac{\cos ax}{x^2+1}\, dx$ by applying Calculus of Residues.	6 Marks	L3	CO2	PO2

(OR)

10.		By Integrating around a Unit circle, evaluate $\int_0^{2\pi} \frac{\cos 3\theta}{5 - 4\cos\theta}\, d\theta$.	12 Marks	L3	CO2	PO2

CODE No.:19BT10501 SVEC19 (RA)

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

PROGRAMMING FOR PROBLEM SOLVING

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Write a short notes on : i) Implicit line joining. ii) Explicit line joining.	6 Marks	L1	CO1	PO1
	b)	Define variable. Explain identifier rules.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Design an algorithm to print first N Fibonacci terms.	6 Marks	L3	CO1	PO2
	b)	Write a python script to perform swapping of two numbers without using third variable.	6 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Read 10 students ages, count the number of students who are having eligibility to vote.	6 Marks	L3	CO2	PO2
	b)	Write a python script to convert given decimal number into Hexadecimal and binary format.	6 Marks	L3	CO2	PO2
		(OR)				
4.	a)	Write the difference between break and continue statements with examples.	6 Marks	L2	CO1	PO1
	b)	Write a python program that takes an integer and forms a new integer which has the number of digits at the ten's place and the least significant digit in the one's place. For ex, 452 → 32.	6 Marks	L3	CO1	PO2

UNIT-III

5.	a)	Compose a python script to perform matrix multiplication.	6 Marks	L3	CO1	PO2
	b)	Write a python script to count the number of vowels, consonants and so on Expected Output: Enter a line of string: adfslkj34 34lkj34334lk Vowels: 1 Consonants: 11 Digits: 9 White spaces: 1	6 Marks	L3	CO1	PO3
		(OR)				
6.	a)	Define List. Explain different operations we can perform on the list with an example.	6 Marks	L2	CO1	PO1
	b)	Write a python script to implement Stack Operations.	6 Marks	L3	CO2	PO2

UNIT-IV

7.	a)	Illustrate following file handling functions with an example program. i) open( ) ii) read( ) iii) readline( ) iv) readlines( )	6 Marks	L2	CO2	PO1
	b)	Define scope and explain usage of global keyword.	6 Marks	L2	CO2	PO1
		(OR)				

8.	a)	Write a program to find factorial of given number using recursion.	6 Marks	L1	C02	PO2
	b)	Develop a python script to copy data from one file to other file.	6 Marks	L2	C01	PO3

UNIT-V

9.	a)	Create a data frame. It contains students' subject wise marks. Add a new column name called total marks for the existing frame.	6 Marks	L3	CO2	PO3
	b)	Illustrate different techniques included in accessing data from data frame.	6 Marks	L3	CO2	PO2

(OR)

10.	a)	Consider data frame contains student marks information. Write a python script to display student details whose marks <60.	6 Marks	L3	CO2	PO3
	b)	Write a python script to print information and frequency counts of a data set.	6 Marks	L3	CO2	PO2

CODE No.: 19BT30101 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

CONSTRUCTION PLANNING AND PROJECT MANAGEMENT

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	List the classification of Stone Masonry.	6 Marks	L1	CO1	PO1
	b)	Explain about Random Rubble Masonry in detail.	6 Marks	L3	CO1	PO1 PO5
		(OR)				
2.	a)	Illustrate different types of spread footings.	6 Marks	L3	CO1	PO1 PO2
	b)	Define Arches. Write about different types of Arches.	6 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Briefly explain different types of paints used in building construction.	6 Marks	L3	CO2	PO1 PO5
	b)	What is termite proofing? Which substance is used as termite proofing?	6 Marks	L1	CO2	PO1
		(OR)				
4.	a)	Write about scaffoldings and list out different types of scaffolding.	6 Marks	L1	CO2	PO1
	b)	Discuss about the latest trends in construction equipment and list out reasons why selection of construction equipment is very important.	6 Marks	L3	CO2	PO1 PO5
		UNIT-III				
5.	a)	List out the factors must be considered for selection of construction equipment.	6 Marks	L2	CO3	PO1 PO6 PO8
	b)	Describe different types of Excavation equipment.	6 Marks	L2	CO3	PO1 PO2
		(OR)				
6.	a)	Explain about divisional organization structure in detail with an example structure.	6 Marks	L3	CO3	PO1 PO5
	b)	Write about the cost of owing the construction equipment and cost of operating the construction equipment.	6 Marks	L1	CO3	PO1
		UNIT-IV				
7.	a)	Explain about different network techniques in construction project management.	6 Marks	L3	CO4	PO1 PO5
	b)	What is a Work Breakdown Structure? How many types of Work Breakdown Structures are there?	6 Marks	L1	CO4	PO1
		(OR)				

8. a)

Time-Estimates (in weeks)			
Activity	**Preceding Activity**	**Most optimistic time (a)**	**Most likely time (m)**
A	None	2	4
B	None	10	12
C	A	8	9
D	A	10	15
E	A	7	7.5
F	B, C	9	9
G	D	3	3.5
H	E, F, G	5	5

8 Marks L5 CO4 PO1 PO2 PO5 PO11

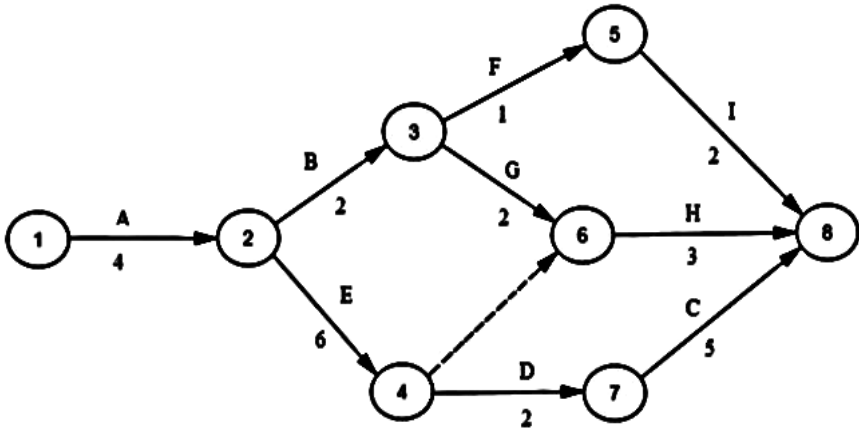
Draw the PERT network for the project.

b) Explain Bar charts or Gantt chart technique in project management. 4 Marks L3 CO4 PO1 PO5

UNIT-V

9. a) Differentiate CPM and PERT methods. 6 Marks L3 CO5 PO1 PO5

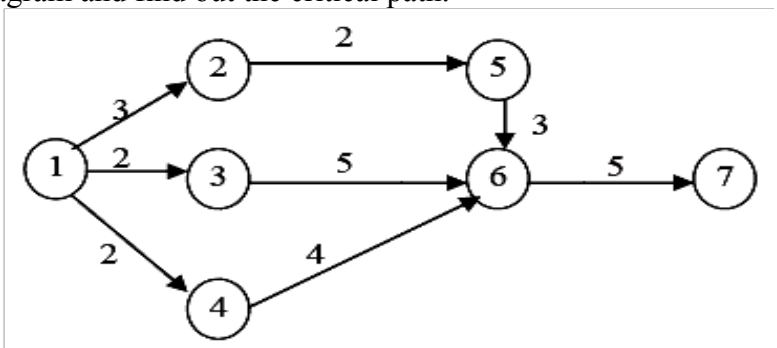
b) Determine the total float, free float for the following network diagram and find out the critical path. 6 Marks L5 CO5 PO1 PO2 PO5



(OR)

10. a) Define and formulate the EST, EFT, LST and LFT. 6 Marks L1 CO5 PO1

b) Determine the total float, free float for the following network diagram and find out the critical path. 6 Marks L5 CO5 PO1 PO5 PO11



❀ ❀ ❀

CODE No.: 19BT30102 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

FLUID MECHANICS
[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

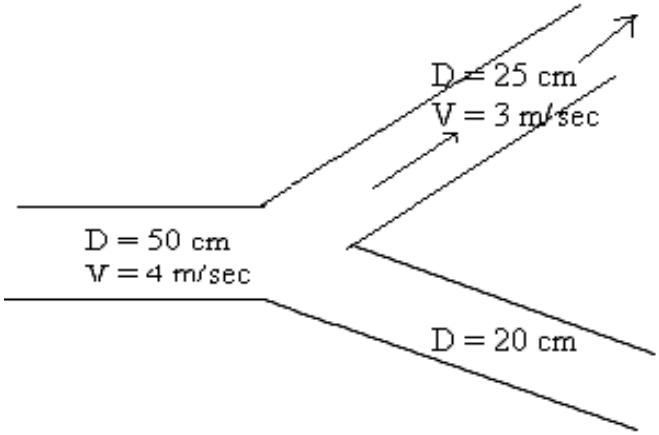
1.	a)	Determine the intensity of shear of an oil having viscosity = 1 poise. The oil is used for lubricating the clearance between a shaft diameter 10cm and its journal bearing. The clearance is 1.5mm and the shaft rotates at 150 r.p.m.	6 Marks	L4	CO1	PO1 PO4 PO5 PO10
	b)	Calculate the density, specific weight and weight of one litre of Petrol of specific gravity = 0.7.	6 Marks	L3	CO1	PO1 PO2 PO5 PO10

(OR)

2.	a)	A plate (2m x 2m), 0.25mm distant apart from a fixed plate moves at 40cm/s and requires a force of 1 N. Determine the dynamic viscosity of the fluid in between the plates.	6 Marks	L3	CO1	PO1 PO2 PO4 PO10
	b)	A Hydraulic press has a Ram of 30cm diameter and a Plunger of 4.5cm diameter. Find the weight lifted by the Hydraulic press when the force applied at the Plunger is 500 N.	6 Marks	L3	CO2	PO1 PO4 PO5 PO10

UNIT-II

3.	a)	A stream function is given by $\Psi = 5x - 6y$. Calculate the velocity components and also magnitude and direction of the resultant velocity at any point.	6 Marks	L3	CO2	PO1 PO2 PO4 PO10
	b)	A pipe 50cm in diameter branches into two pipes of diameters 25cm and 20cm respectively as shown in figure. If the average velocity in 50cm diameter pipe is 4m/sec, find (i) Discharge through 50cm diameter pipe and (ii) Velocity in 20cm diameter pipe if the average velocity in 25cm pipe is 3m/sec.	6 Marks	L3	CO3	PO1 PO4 PO5 PO10



(OR)

4.	a)	The velocity vector in a fluid flow is given $V = 4x^3\,\bar{i} - 10x^2 y\,\bar{j} + 2t\,\bar{k}$. Find the velocity and acceleration of a fluid particle at (2, 1, 3) at time t = 1.	6 Marks	L4	CO2	PO1 PO2 PO5 PO10
	b)	Derive Force exerted by a flowing fluid on a pipe-bend using Impulse- momentum equation.	6 Marks	L3	CO3	PO1 PO2
		UNIT-III				
5.	a)	In a 100mm diameter horizontal pipe a Venturimeter of 0.5 contraction ration has been fixed. The head of water on the Venturimeter when there is no flow is 3m (gauge). Find the rate of flow for which the throat pressure will be 2m of water absolute. Take C_d is 0.97 and atmospheric pressure head = 10.3m of water.	6 Marks	L4	CO3	PO1 PO4 PO5 PO10
	b)	A pitot-tube is inserted in a pipe of 300mm diameter. The static pressure in pipe is 100mm of mercury (vacuum). The stagnation pressure at the centre of the pipe, recorded by the Pitot tube is 0.981 N/cm^2. Calculate the rate of flow of water through pipe, if the mean velocity of flow is 0.85 times the central velocity. Take C_v - 0.98.	6 Marks	L4	CO3	PO1 PO2 PO5 PO10
		(OR)				
6.	a)	A rectangular notch 400mm long is used for measuring a discharge of 30 lit/sec. An error of 1.5mm was made, while measuring the head over the notch. Calculate the percentage error in the discharge assuming co-coefficient of discharge as 0.60.	6 Marks	L4	CO4	PO1 PO2 PO4 PO10
	b)	Water flows through a 100mm diameter pipe with a velocity of 0.015m/sec. If the kinematic viscosity of water is 1.13×10^{-6} m^2/sec, find the friction factor of the pipe material.	6 Marks	L4	CO4	PO1 PO2 PO5 PO10
		UNIT-IV				
7.	a)	Describe Reynold's experiment and mention features of Laminar flow.	6 Marks	L2	CO5	PO1 PO2
	b)	Calculate the pressure gradient along flow, average velocity and discharge of an oil of viscosity 0.02Ns/m^2 flowing between two stationary parallel plates 1m wide maintained 10 mm apart. The velocity midway between the plates is 3m/sec.	6 Marks	L4	CO5	PO1 PO2 PO4 PO5 PO10
		(OR)				
8.	a)	Derive an expression for Hagen Poiseuille formula.	6 Marks	L3	CO5	PO1 PO2
	b)	A Crude Oil of viscosity 0.97 poise and relative density 0.9 is flowing through a horizontal circular pipe of diameter 100mm and of length 10m. Calculate the difference of pressure at the two ends of the pipe, if 100 kg of oil is collected in a tank in 30 seconds.	6 Marks	L4	CO5	PO1 PO2 PO4 PO5 PO10

UNIT-V

9.	a)	A model of 1.0m wide and 5.5m long rectangular weir is to be built over a river. The average depth of water in the river is 4m. The model which has a scale ratio of 1:36 was tested for velocity of flow of 0.5m/s in the laboratory. It was found that the force acting on the model was 2.5N and the height of the standing wave was 40mm. Determine prototype of corresponding speed and force acting.	6 Marks	L4	CO6	PO1 PO2 PO4 PO10
	b)	A 1.0m log model of a ship is towed at a speed of 81cm/s in a towing tank 64m long does this correspond to find out the speed of the ship.	6 Marks	L4	CO6	PO1 PO2 PO5 PO10
		(OR)				
10.		The resisting force of a supersonic plane during flight can be considered as dependent on the length of the aircraft L, velocity V, viscosity μ, mass density ρ, bulk modulus K. Express the fundamental relationship between resisting force and these variables.	12 Marks	L4	CO6	PO1 PO2 PO4 PO5 PO10

CODE No.: 19BT30103 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

MECHANICS OF SOLIDS

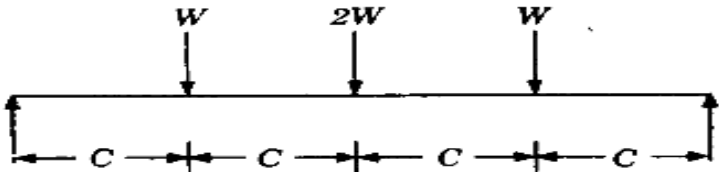
[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

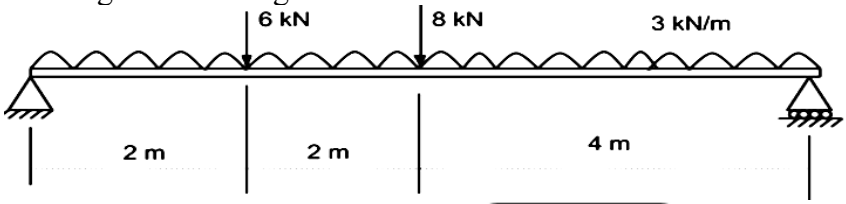
UNIT-I

1.	a)	Analyze a simply supported beam with uniformly varying load with maximum intensity at the mid span, draw the Shear force and Bending moment diagrams and also find the maximum Bending moment.	5 Marks	L4	CO1	PO1 PO2 PO5
	b)	i) Differentiate the following types of supports and draw the diagrams along with the un-known reactions at each support. A) Hinge support. B) Roller support. C) Fixed support.	7 Marks	L4	CO1	PO1 PO2 PO4 PO5
		ii) A simply supported beam is loaded as shown in the below figure. Analyze the beam and find the maximum shear force in the beam.				



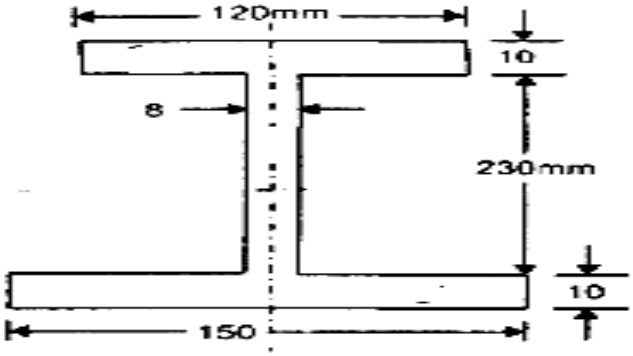
(OR)

2.	a)	A cantilever beam 5m long carries concentrated loads of 30kN, 40kN and 50 KN at distances of 1.5m, 3m and 4.5m from the fixed end. In addition to this the beam carries a uniformly distributed load of 10kN/m over the entire length of the beam. Analyze the beam and draw the Shear Force diagram and Bending moment diagram.	6 Marks	L4	CO1	PO1 PO2 PO5
	b)	Analyze the given beam and draw the Shear Force diagram and Bending moment diagram for the beam shown below .	6 Marks	L4	CO1	PO1 PO2 PO5



UNIT-II

3.		The cross-section of an I-beam is shown in the figure. The Shear force at the section is 50kN. Analyze the beam and calculate Shear stress distribution diagram. All dimensions are in 'mm'.	12 Marks	L4	CO1	PO1 PO2 PO4 PO5



(OR)

4.	a)	Determine the ratio of the maximum shear stress to the average shear stress of a rectangular section having width "b" and depth "d".	6 Marks	L4	CO2	PO1 PO2 PO4
	b)	A laminated wood beam 10cm wide and 15cm deep is made up of three 5cm x 10cm wide planks glued together to resist longitudinal shear. The beam is simply supported over a span of 2m. If the allowable shearing stress in the glued joint is 0.45MN/m^2, find the safe concentrated load that the beam may carry at its centre.	6 Marks	L5	CO2	PO1 PO2 PO4 PO6 PO10

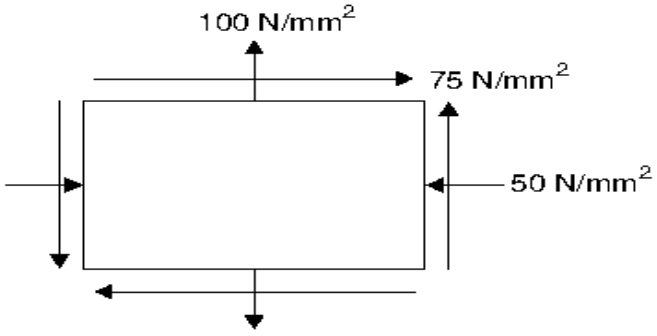
UNIT-III

5.	a)	Derive torsional equation for a circular shaft with neat sketch.	6 Marks	L4	CO3	PO1 PO2 PO4
	b)	A steel shaft 'A' of diameter 'd' and length 'l' is subjected to a torque 'T' Another shaft 'B' made of aluminium of the same diameter 'd' and length 0.5l is also subjected to the same torque 'T'. The shear modulus of steel is 2.5 times the shear modulus of aluminium. The shear stress in the steel shaft is 100MPa. Find the shear stress in the aluminium shaft.	6 Marks	L4	CO3	PO1 PO2 PO4 PO5

(OR)

6.		A closed coil helical spring has mean diameter of 75mm and spring constant of 90kN/m. The spring consists of 8 coils. Determine the suitable diameter of spring wire if maximum shear stress is not exceeded 250MN/m^2. Modulus of rigidity of the spring wire material is 80GN/m^2. What is the maximum axial load the spring can carry?	12 Marks	L4	CO3	PO1 PO2 PO5 PO10

UNIT-IV

7.	a)	State of stress at a point in a material is as shown in the figure. Determine: i) Principal stresses. ii) Maximum shear stress. iii) Plane of maximum shear stress. iv) The resultant stress on the plane of maximum shear stress.  	6 Marks	L4	CO4	PO1 PO2 PO5 PO10
	b)	Discuss briefly the equations for normal stresses, max shear stress for a Bi-axial stress acting on an inclined plane of a 2D block element.	6 Marks	L4	CO4	PO1 PO2 PO5 PO10

(OR)

8.	a)	Explain briefly Maximum Principal Strain theory	6 Marks	L4	CO5	PO1 PO2 PO3 PO10
	b)	At a point in a stressed material, the three principal stresses are 90N/mm^2 (tensile), 60N/mm^2 (tensile) and 30N/mm^2 (compressive). Find the factor of safety if the yield stress is 230N/mm^2 and $\nu = 0.3$ by the principal stress, shear stress and principal strain theories.	6 Marks	L4	CO5	PO1 PO2 PO3
		UNIT-V				
9.	a)	Define Eccentrically loaded columns and also define core/kern of a column.	6 Marks	L4	CO6	PO1 PO2 PO5
	b)	Derive the expression for crippling load of a column when both the ends of the column are hinged.	6 Marks	L4	CO6	PO1 PO2 PO5
		(OR)				
10.	a)	Compare the ratio of the strength of a solid steel column to that of a hollow of the same cross section areas. Assume the internal diameter of the hollow column to be three-fourths of the external diameter. Both the columns have the same length and are pinned at the ends.	6 Marks	L4	CO6	PO1 PO2 PO3 PO10
	b)	A column is of rectangular shape of size 300mm x 200mm carries Compressive load of 25kN. Factor of safety is 3 and E = 2.1 x 10^{5}N/mm^2. Determine the length of the column whose one end is hinged and the other end is free.	6 Marks	L4	CO6	PO1 PO2 PO3 PO10

CODE No.: 19BT30104 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

SURVEYING
[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What are the sources of error in chaining? What precautions would you take to guard against them?	5 Marks	L4	CO1	PO1 PO2 PO5
	b)	Below are the bearings observed in a traverse survey conducted with a prismatic compass at a place where local attraction was suspected.	7 Marks	L4	CO1	PO1 PO2 PO4 PO5

Line	F.B	B.B
AB	$191^0 45^1$	$13^0 0^1$
BC	$39^0 30^1$	$222^0 30^1$
CD	$22^0 15^1$	$200^0 30^1$
DE	$242^0 45^1$	$62^0 45^1$
EA	$330^0 15^1$	$147^0 45^1$

At what stations do you suspect local attraction? Find the corrected bearings of the lines and also calculate the included angles.

(OR)

2.	a)	Discuss in detail about two methods of ranging.	7 Marks	L4	CO1	PO1 PO2 PO5
	b)	Discuss how you would overcome the chaining problem if there are obstacles on the chain line. Assuming that: i) Chaining around the obstacle is possible. ii) Chaining around the obstacle is not possible.	5 Marks	L4	CO1	PO1 PO2 PO5

UNIT-II

3.	a)	The following consecutive readings were taken with a dumpy level, the instrument having been moved after the second, fourth and eighth readings: 0.875, 1.235, 2.310, 1.385, 2.930, 3.125, 4.125, 0.210, 1.875, 2.030, 3.765 The first reading was taken with the staff held upon a benchmark of elevation 132.135. Tabulate the page of field book and calculate the levels of the points	7 Marks	L4	CO2	PO1 PO2 PO4
	b)	Describe about the uses of contours with the help of neat sketches.	5 Marks	L4	CO2	PO1 PO2 PO4

(OR)

4.	a)	Discuss about the characteristics of contours with the help of neat sketches.	6 Marks	L4	CO2	PO1 PO2 PO4
	b)	Explain about any two methods of contouring with sketches.	6 Marks	L4	CO2	PO1 PO2 PO4

UNIT-III

5.	a)	Demonstrate the procedure of measuring horizontal angle by repetition method.	6 Marks	L4	CO3	PO1 PO2 PO4
	b)	The constant for an instrument is 1200 and the value of additive constant is 0.4 meters. Calculate the distance from the instrument to the staff when the micrometer readings are 6.362 and 6.458 the staff intercept is 2.5m and the line of sight is inclined at $+6^{0}30'$, the staff being held vertically.	6 Marks	L4	CO3	PO1 PO2 PO4 PO5
		(OR)				
6.	a)	Explain the principle of tangential method of tachometric survey.	6 Marks	L4	CO3	PO1 PO2 PO5 PO10
	b)	Draw a neat sketch of a vernier theodolite and explain the functions of the various parts.	6 Marks	L4	CO3	PO1 PO2 PO4

UNIT-IV

7.	a)	The following perpendicular offsets were taken at 10m intervals from a survey line to an irregular boundary line. 2.30, 3.75, 4.50, 6.75, 5.25, 7.30, 8.95, 8.25, 5.55m. Calculate the area included between the survey line, the irregular boundary line and the first and last offsets by: i) Average-ordinate rule. ii) Trapezoidal rule.	6 Marks	L4	CO4	PO1 PO2 PO5 PO10
	b)	A railway embankment 500m long is 9m wide at the formation level and has the side slope 2 to 1. The ground levels at every 100m along the centre line are as under.	6 Marks	L4	CO4	PO1 PO2 PO5 PO10

Chainage in meters	0	100	200	300	400	500
Level in meters	107.8	106.3	110.5	111.0	110.7	112.2

The formation level at zero chainage is 110.5m and the embankment has a rising gradient of 1.2m in 100. The ground is level across the centre line. Calculate the Volume of earthwork
i) Trapezoidal rule. ii) Prismoidal formula.

(OR)

8.		Explain in detail about any two methods of setting of simple curves with sketches.	12 Marks	L4	CO5	PO1 PO2 PO5

UNIT-V

9.	a)	What are the precautions to be considered while using a total station?	6 Marks	L4	CO6	PO1 PO2 PO5
	b)	Write a note on interior drone surveying and exterior drone surveying.	6 Marks	L4	CO6	PO1 PO2 PO5
		(OR)				
10.	a)	Discuss about the good practices in using total station.	6 Marks	L4	CO6	PO1 PO2 PO5
	b)	Explain the principles of EDM with an example.	6 Marks	L4	CO6	PO1 PO2 PO5

CODE No.: 19BT30201 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

ELECTRICAL MACHINES-I

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the constructional features of a DC machine with the help of neat sketch.	6 Marks	L1	CO1	PO1
	b)	An 8 pole, DC shunt generator with 770 wave connected armature conductors and running at 500 r.p.m supplied a load of 12.5Ω resistance at a terminal voltage of 250V. Armature resistance is 0.24Ω and field resistance is 250Ω. Find armature current and induced EMF. Also find the flux per pole.	6 Marks	L3	CO1	PO4
		(OR)				
2.	a)	Derive the EMF equation of a DC generator.	6 Marks	L2	CO1	PO1
	b)	A compound generator delivers a load current of 50A at 500V. The resistances are R_a=0.05Ω, R_{se}= 0.064Ω and R_{ah}= 250Ω. The brush contact drop is 1 volt/brush. Find the induced EMF and Armature current when the machine connected as: i) long shunt. ii) short shunt.	6 Marks	L3	CO1	PO2

UNIT-II

3.	a)	What is armature reaction? Describe the effects of armature reaction on the operation of DC machine and how the armature reaction is minimized.	6 Marks	L4	CO1	PO1
	b)	A 4 pole lap wound generator having 480 armature conductors. Supplies a current of 150A. If the brushes are given a lead of 10^0. Calculate demagnetizing amperes turns/pole and cross magnetising ampere turns/pole.	6 Marks	L3	CO1	PO1
		(OR)				
4.	a)	What is commutation? Explain the methods of improving commutation.	6 Marks	L4	CO1	PO3
	b)	What are the conditions for voltage build up of a dc shunt generator?	6 Marks	L2	CO2	PO2

UNIT-III

5.	a)	Explain the Speed-Current, Torque-Current and Speed-Torque characteristics of a DC shunt and series motors.	6 Marks	L1	CO3	PO3
	b)	A 250V shunt motor has an R_a =0.2 Ω and R_{sh} = 250 Ω. The motor draws 25A runs at 1000 r.p.m. Calculate the speed when the line current is 50A, if armature reaction weakens the field by 3%. Determine the torque in both cases.	6 Marks	L3	CO3	PO2
		(OR)				
6.	a)	Derive torque equation of a DC motor from first principles.	6 Marks	L1	CO3	PO1
	b)	A 4 pole series motor has 944 wave connected armature conductors. At a certain load flux per pole is 34.6mwb and the total mechanical torque developed is 209N-m. Calculate the line current taken by the motor and speed at which it will run with an applied voltage of 500V. Total armature resistance is 3Ω.	6 Marks	L3	CO3	PO2

UNIT-IV

7.	a)	Draw the phasor diagram of loads for single phase transformer.	6 Marks	L2	CO4	PO2
	b)	Derive the EMF equation of a single phase transformer.	6 Marks	L1	CO4	PO1

(OR)

8.	a)	Explain clearly how to perform the OC test on single phase transformer. Write the formulae.	6 Marks	L3	CO4	PO4
	b)	A 15KVA, 2200/220V, 50Hz transformer gave the following results. OC test (L.V side): V =220V, I=2.742A, P=185W. SC test (H.V side): V =112V, I=6.3A, P=197W. Compute the efficiency at full load 0.8 p.f lead.	6 Marks	L3	CO4	PO2

UNIT-V

9.	a)	Give the merits and demerits of star delta connected three phase transformers. Explain the function.	6 Marks	L2	CO4	PO1
	b)	Explain about the Scott connection with neat sketch.	6 Marks	L3	CO4	PO2

(OR)

10.	a)	Give the merits and demerits of delta connected three phase transformers. Explain the function.	6 Marks	L2	CO4	PO1
	b)	Illustrate the various types of three phase transformers connections.	6 Marks	L1	CO4	PO1

CODE No.: 19BT30202 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

ELECTROMAGNETIC FIELDS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	State and explain Gauss's law and derive point form of Gauss's law also calculate **E** due to infinite surface charge distribution	6 Marks	L2	CO1	PO2
	b)	A Uniform volume charge density of $80\mu C/m^3$ is present throughout the region 8mm < r < 10mm. Let $\rho_v = 0$ for 0 < r < 8mm. i) Find the total charge inside the spherical surface r = 10 mm. ii) Find D_r at r = 10mm.	6 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Derive an expression for Electric field intensity (**E**) due to infinite line charge distribution.	6 Marks	L2	CO1	PO1
	b)	Find electric field intensity at a point ($\mathbf{r}$, θ, ϕ), where r>>d, due to two pint charges Q and –Q are located at (0, d/2, 0) and (0, -d/2, 0).	6 Marks	L3	CO1	PO2
		UNIT-II				
3.	a)	Why are there no free charge in the interior or a good conductor under static condition? Explain.	5 Marks	L2	CO1	PO2
	b)	Assume that two homogeneous isotropic dielectric media with dielectric constants $\varepsilon_{r1} = 3$ and $\varepsilon_{r2} = 2$ are separated by the xy-plane. At a common point $\mathbf{E_1}=\mathbf{a_x}-5\mathbf{a_y}-4\mathbf{a_z}$. Find E_2, D_2, α_1 and α_2.	7 Marks	L3	CO1	PO2
		(OR)				
4.	a)	Write the capacitance formula for a parallel-plate capacitor of area S whose plates are separated by a medium of dielectric constant ε and thickness **d**.	6 Marks	L2	CO1	PO1
	b)	What are the boundary conditions for electrostatic fields at an interface between a conductor and a dielectric with permittivity ε.	6 Marks	L2	CO1	PO1
		UNIT-III				
5.	a)	An infinitely long straight, solid, nonmagnetic conductor with a circular cross section of radius **b** carries a steady current **I**. Determine the magnetic flux density both inside and outside the conductor.	6 Marks	L2	CO2	PO2
	b)	Which postulate of magnetostatics denies the existence of isolated magnetic charges? Explain.	6 Marks	L1	CO2	PO2
		(OR)				
6.	a)	Find the magnetic flux density at a point on the axis of a circular loop of radius **b** that carries a direct current **I**.	6 Marks	L2	CO2	PO2
	b)	A thin ring of radius 5cm is placed on plane z = 1cm so that its centre is at (0, 0, 1)cm. If the ring carries 50mA along $\mathbf{a_\phi}$, find **H** at (0, 0, -1)cm.	6 Marks	L2	CO2	PO2

UNIT-IV

7.	a)	A conducting filamentary triangle joins A (3, 1, 1), B (5, 4, 2) and C (1, 2, 4). The segment AB carries a current of 0.2 A in the $\mathbf{a_{AB}}$ direction. In the presence of magnetic field $B = 0.2a_x - 0.1a_y + 0.3a_z T$. i) i) Find the force on segment BC. ii) ii) Find the torque on the loop about an origin at A.	6 Marks	L2	CO2	PO2
	b)	Derive the expression for torque on a current loop placed in a magnetic field.	6 Marks	L2	CO2	PO2
		(OR)				
8.	a)	Write a short note on Scalar magnetic potential and its properties.	5 Marks	L2	CO2	PO2
	b)	A rectangular loop carrying current I_2 is placed parallel to an infinitely long filamentary wire carrying current I_1 as shown below. Show that the force experienced by the loop is given by $F = -\frac{\mu_0 I_1 I_2 b}{2\pi}\left[\frac{1}{\rho_0} - \frac{1}{\rho_0 + a}\right] a_\rho N$	7 Marks	L2	CO2	PO4

UNIT-V

9.	a)	State and explain Maxwell's equations in differential and integral form for time varying fields.	6 Marks	L2	CO3	PO2
	b)	State and explain poynting theorem.	6 Marks	L2	CO3	PO2
		(OR)				
10.	a)	In free space $E = 20\cos(\omega t - 50_x)a_y V/m$, find i) J_d ii) H iii) ω	6 Marks	L2	CO3	PO4
	b)	State and explain faraday's laws of electromagnetic induction.	6 Marks	L2	CO3	PO2

CODE No.: 19BT30203 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

SIGNALS AND NETWORKS

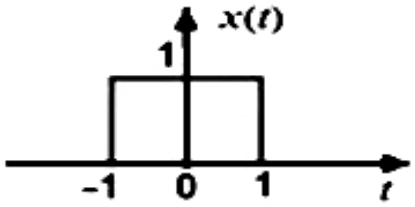
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Illustrate whether the following signals are periodic or aperiodic. If the signal is periodic find its fundamental period. i) $x(n) = 3\cos(10n + \pi/6)$ ii) $x(n) = e^{(j\pi n/2)}$	6 Marks	L3	CO1	PO2
	b)	Consider the following signal and sketch for the given $x(-2t+1)$.	6 Marks	L3	CO1	PO2

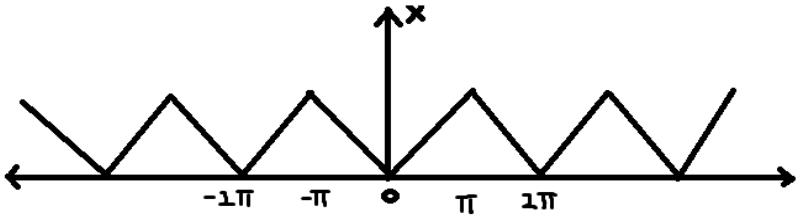


(OR)

2.	a)	Distinguish between Energy and Power signals.	4 Marks	L2	CO1	PO1
	b)	Determine and sketch $y(t) = x(t) + x(2-t)$ where $x(t) = u(t+2) - u(t-1)$. Express *y(t)* in terms of step functions.	8 Marks	L3	CO1	PO2

UNIT-II

3.	a)	State any four properties of fourier series .	4 Marks	L1	CO2	PO1
	b)	Find the fourier series expansion for the waveform shown in figure.	8 Marks	L3	CO2	PO2



The waveform is $x(t) = \begin{cases} -\frac{At}{\pi} & for\ -\pi \le t \le 0 \\ \frac{At}{\pi} & for\ 0 \le t \le \pi \end{cases}$

(OR)

4.	a)	Check the following signals $\cos n\omega_0 t$ *and* $\cos m\omega_0 t$ are Orthogonal or not.	4 Marks	L2	CO2	PO2
	b)	The given rectangular pulse is $x(t) = \begin{cases} 1, & \lvert t\rvert < T_1 \\ 0, & \lvert t\rvert < T_1 \end{cases}$. Find the fourier transform .	8 Marks	L3	CO2	PO2

UNIT-III

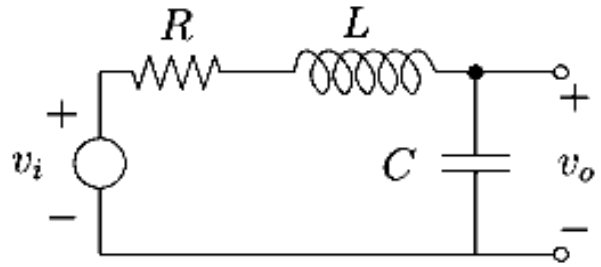
5.	a)	Find the Laplace transform and ROC of the signal $-e^{-at}u(-t)$.	6 Marks	L3	CO2	PO5
	b)	Find the inverse Laplace transform of the $X(s) = \frac{2s+1}{(s+1)(s^2+2s+2)}$.	6 Marks	L3	CO2	PO5

(OR)

6.	a)	Find the z- transform of $x[n] = (2)^n u[n] + \left(\frac{1}{3}\right)^{-n} u[-n]$.	6 Marks	L3	CO2	PO5
	b)	Determine the Inverse ZT, for the following ZT $X[z] = \frac{2-\frac{3}{2}z^{-1}}{1-\frac{3}{2}z^{-1}+\frac{1}{2}z^{-2}}$ *for ROC* $\lvert z\rvert > 1$.	6 Marks	L3	CO2	PO2

UNIT-IV

7.	a)	An electrical circuit shown below has $R = 1K\Omega$, $L = 1\mu H$, $C = 1\mu F$.	6 Marks	L3	CO3	PO2

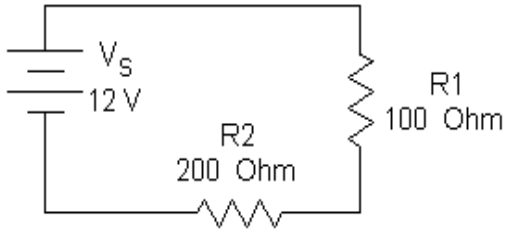


i) Find the system equation (ODE) which relates $v_i(t)$ *with* $v_0(t)$.
ii) Determine transfer function H(s).
iii) Draw magnitude response $\|H(j\omega)\|$.

	b)	A signal $v_i(t) = 10\cos(1000\pi t)$ *Volts* is applied to the circuit shown in 7(a). Comment whether the signal is passed or stopped by the circuit.	6 Marks	L3	CO3	PO5

(OR)

8.	a)	Differentiate RL and RC circuits	4 Marks	L2	CO3	PO1
	b)	For the electrical network shown below, answer the following	8 Marks	L3	CO3	PO2

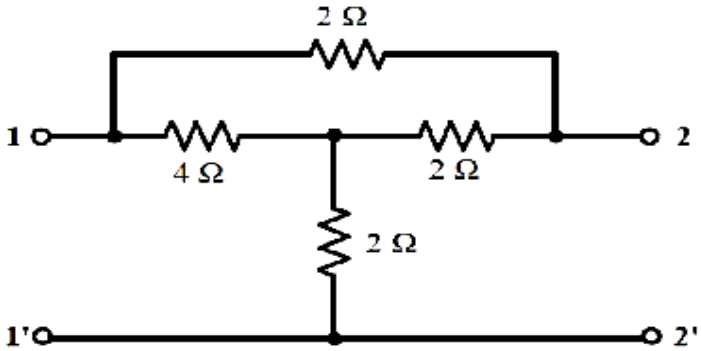


i) Find the impulse response function for this network.
ii) Determine the frequency response function.
iii) Sketch the magnitude and the phase response.

Assume that the output is taken across the 100ohm resistor.

UNIT-V

9.	a)	For the given 2-port network, find the value of transfer impedance z_{21} in ohms	6 Marks	L3	CO4	PO2



	b)	Write short notes on Z,Y,T and h parameters.	6 Marks	L2	CO4	PO1

(OR)

10.	a)	Write short notes on Transfer function and Driving point function.	6 Marks	L3	CO4	PO2
	b)	Explain transmission (ABCD) parameters in detail.	6 Marks	L1	CO4	PO1

❀ ❀ ❀

CODE No.: 19BT30301 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

ENGINEERING THERMODYNAMICS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What is meant by thermodynamic equilibrium? Explain the concept of macroscopic and microscopic view point as applied to study of thermodynamics.	6 Marks	L2	CO1	PO1
	b)	A gas undergoes a reversible non-flow process according to P = (-3V+15) where V is the volume in m^3 and P is the Pressure in bar. Determine the work done when the volume changes from 3 to 6 m^3.	6 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Show that internal energy is a property of the system.	6 Marks	L2	CO1	PO2
	b)	A steam turbine operates under steady flow conditions receiving steam at the following state: Pressure 15 bar, internal energy 2700 kJ/kg, specific volume 0.17 m^3/kg and velocity 100 m/s. The exhaust of steam from the turbine is at 0.1 bar with internal energy 2175 kJ/kg, specific volume 15 m^3/kg and velocity 300 m/s. The intake is 3 m above the exhaust. The turbine develops 35 kW and heat loss over the surface of turbine is 20 kJ/kg. Determine the steam flow rate through the turbine.	6 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Explain Kelvin Planck and Clausius statements and their equivalence.	6 Marks	L1	CO1	PO1
	b)	A reversible heat engine operates between 875 K and 310 K and drives a reversible refrigerator operating between 310 K and 255 K. The engine receives 2000 kJ of heat and the net work output from the arrangement equals 350 kJ. Make calculations for the cooling effect.	6 Marks	L3	CO1	PO2
		(OR)				
4.	a)	What is Clausius inequality? Explain the entropy principle.	6 Marks	L2	CO1	PO1
	b)	A lump of steel of mass 8 kg at 1000 K is dropped in 80 kg of oil at 300 K. Make calculations for the entropy change of steel, the oil and the universe. Take specific heats of steel and oil as 0.5 kJ/kg.K and 3.5 kJ/kg.K respectively.	6 Marks	L3	CO1	PO2

UNIT-III

5.	a)	Define dryness fraction and explain the process of steam generation (change of phase of water) at constant pressure. Show the various stages on P-v and T-s diagrams.	6 Marks	L2	CO2	PO2
	b)	Wet steam at 20 bar pressure and 0.9 dryness fraction is heated reversibly at constant pressure to a temperature of 300^0C. Make calculations for the work done, heat supplied and changes in internal energy and entropy.	6 Marks	L3	CO2	PO2
		(OR)				

6.	a)	Derive the first and second Tds equations and set up the expression for the difference in heat capacities $\mathbf{c_p}$ and $\mathbf{c_v}$. State the significance of this expression.	12 Marks	L3	CO1	PO2
		UNIT-IV				
7.	a)	Define the characteristic gas constant. How does it differ from universal gas constant. Write units for these constants.	6Marks	L1	CO3	PO2
	b)	Explain Law of corresponding states and compressibility factor.	6 Marks	L2	CO3	PO2
		(OR)				
8.	a)	Derive expression for gas constant and molecular mass of the gas mixture.	6Marks	L2	CO3	PO1
	b)	Determine the gas constant, density and partial pressures of the components of a gas mixture consisting of 10 mass fractions of air and 1 mass fractions of lighting gas. Take density of lighting gas 0.5 kg/m^3 at 101325 N/m^2 pressure and 273 K temperature.	6Marks	L3	CO3	PO2
		UNIT-V				
9.	a)	Derive an expression for the thermal efficiency of Otto cycle with aid of P-v and T-s diagrams.	6 Marks	L3	CO4	PO2
	b)	The swept volume of a diesel engine working on dual cycle is 0.0053 m^3 and clearance volume is 0.00035 m^3. The maximum pressure is 65 bar. Fuel injection ends at 5 per cent of the stroke. The temperature and pressure at the start of the compression are 80^0C and 0.9 bar. Determine the air standard efficiency of the cycle. Take γ for air = 1.4.	6 Marks	L3	CO4	PO2
		(OR)				
10.	a)	Explain the working of stirling and ericsson cycles with the aid of P-v and T-s diagrams.	6 Marks	L3	CO4	PO2
	b)	In an air standard otto cycle engine, the temperature at the end of compression stroke is 650 K and the maximum cycle temperature is 2400 kJ/kg. If the engine delivers 700 kJ/kg of network, find the thermal efficiency and compression ratio of the engine.	6 Marks	L3	CO4	PO2

CODE No.: 19BT30302 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

KINEMATICS OF MACHINERY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

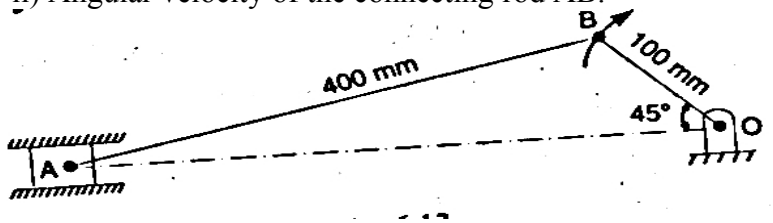
Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the different types of kinematic pairs with examples.	6 Marks	L2	CO1	PO1
	b)	Explain any two inversions of a single slider crank chain with neat sketch.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Define kinematic link. Describe types of links with example.	6 Marks	L2	CO1	PO1
	b)	Explain the terms: i) Degree of freedom. ii) Lower pair. iii) Higher pair.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.		Describe the different approximate straight line motion mechanisms with the help of a neat sketch.	12 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Explain the Ackerman steering gear mechanism with neat sketch.	6 Marks	L2	CO3	PO1
	b)	Derive an expression for the ratio of angular velocities of the shafts of a Hooke's joint.	6 Marks	L3	CO3	PO1, PO2
		UNIT-III				
5.	a)	Derive an expression for the length of path of contact in a pair of meshed spur gears.	6 Marks	L4	CO4	PO1, PO2
	b)	A pinion having 30 teeth drives a gear having 80 teeth. The profile of the gear is Involute with 20^0 pressure angle, 12mm module and 10mm addendum. Find the length of path of contact, arc of contact and the contact ratio.	6 Marks	L4	CO4	PO1, PO2, PO3
		(OR)				
6.	a)	Explain the types of gear trains with neat sketch.	6 Marks	L2	CO4	PO1,
	b)	In an epicyclic gear train, an arm carries two gears A and B having 40 and 50 teeth respectively. If the arm rotates at 200 r.p.m. in the anticlockwise direction about the centre of the gear A which is fixed, determine the speed of gear B? If the gear A instead of being fixed, makes 400 r.p.m. in the clockwise direction, what will be the speed of gear B?	6 Marks	L4	CO4	PO1, PO2, PO3
		UNIT-IV				
7.		Draw the profile of a cam operating a knife-edged follower having a lift of 30mm. The follower moves outwards with SHM during 150^0 of cam rotation and followed by dwell for 60^0. The follower descends for the next 100^0 rotation of the cam with uniform velocity, again followed by a dwell period. The cam rotates at a uniform velocity of 120 r.p.m and has a least radius of 20mm. What will be the maximum velocity and acceleration of the follower during the outstroke and return stroke?	12 Marks	L3	CO5	PO1, PO2, PO3
		(OR)				

8.		A cam, with a minimum radius of 25mm, rotating clockwise at a uniform speed is to be designed to give a roller follower, at the end of a valve rod, motion described below : i) To raise the valve through 50mm during 120^0 rotation of the cam. ii) To keep the valve fully raised through next 30^0. iii) To lower the valve during next 60^0. iv) To keep the valve closed during rest of the revolution. The diameter of the roller is 20mm and the diameter of the cam shaft is 25mm. Draw the profile of the cam when line of the stroke is offset 15mm from the axis of the cam shaft. The displacement of the valve, while being raised and lowered, is to take place with simple harmonic motion. Determine the maximum velocity and acceleration of the valve rod when the cam shaft rotates at 100 r.p.m.	12 Marks	L3	CO5	PO1, PO2, PO3

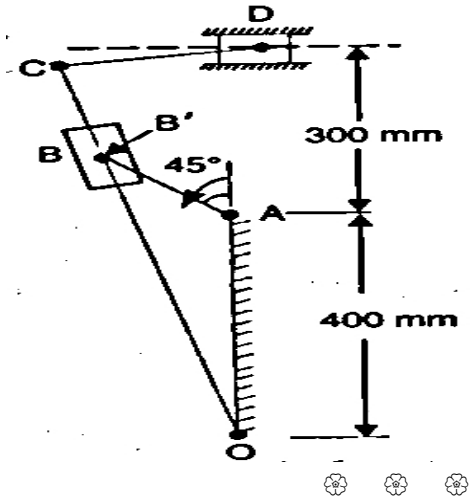
UNIT-V

9.	a)	Explain the types of Instantaneous centres with neat sketch	6 Marks	L2	CO6	PO1,
	b)	Locate all the instantaneous centres of the slider crank mechanism as shown in fig. The lengths of crank OB and connecting rod AB are 100mm and 400mm respectively. If the crank rotates clockwise with an angular velocity of 15 rad/s, find: i) Velocity of the slider A ii) Angular velocity of the connecting rod AB.	6 Marks	L4	CO6	PO1, PO2, PO3



(OR)

10.		A mechanism of a crank and slotted lever quick return motion is shown in fig. If the crank rotates counter clockwise at 150 r.p.m, determine for the configuration shown, the velocity and acceleration of the ram D. Also determine the angular acceleration of the slotted lever. Crank AB = 150mm, Slotted arm OC = 700mm and link CD = 200mm.	12 Marks	L4	CO6	PO1, PO2, PO3



CODE No.: 19BT30303 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

MANUFACTURING TECHNOLOGY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	List types of pattern allowances and explain any two allowances with neat sketches.	6 Marks	L1	CO1	PO1
	b)	Explore design of gating system with neat sketch.	6 Marks	L2	CO1	PO1 PO2 PO3
		(OR)				
2.	a)	Explain working of blast furnace with neat diagram.	8 Marks	L2	CO1	PO1
	b)	Define pattern and explain any two types of patterns with neat sketches.	4 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Explain the working principle of shell moulding with neat sketch.	6 Marks	L2	CO2	PO1
	b)	Discuss differences between cold die casting and hot die casting methods.	6 Marks	L1	CO2	PO1
		(OR)				
4.	a)	Elaborate the working of permanent mould casting with neat diagram.	6 Marks	L2	CO2	PO1
	b)	Write advantages, disadvantages and applications of centrifugal casting process.	6 Marks	L1	CO2	PO1
		UNIT-III				
5.	a)	Explain direct extrusion process with neat sketch.	6 Marks	L2	CO3	PO1
	b)	Explain working of electro hydraulic forming with neat sketch.	6 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Discuss the working principle of wire drawing with neat sketch.	6 Marks	L2	CO3	PO1
	b)	Elaborate explosive forming working with neat sketch.	6 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	Write difference between TIG and MIG welding processes.	6 Marks	L1	CO4	PO1
	b)	Elaborate the working of spot resistance welding process with neat sketch.	6 Marks	L2	CO4	PO1
		(OR)				
8.	a)	Discuss working of laser beam welding process with neat sketch.	6 Marks	L2	CO4	PO1
	b)	Discuss destructive and non destructive testing of welds.	6 Marks	L1	CO4	PO1
		UNIT-V				
9.	a)	Explain working principle of blow moulding process with neat diagram.	6 Marks	L2	CO5	PO1
	b)	Write difference between thermoforming and thermosetting plastics.	6 Marks	L1	CO5	PO1
		(OR)				
10.	a)	List out various types of additives in plastics and write advantages and disadvantages of additives.	6 Marks	L1	CO5	PO1
	b)	Explain working of compression moulding process with neat diagram.	6 Marks	L2	CO5	PO1

❀ ❀ ❀

CODE No.: 19BT30304 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

STRENGTH OF MATERIALS
[Mechanical Engineering]

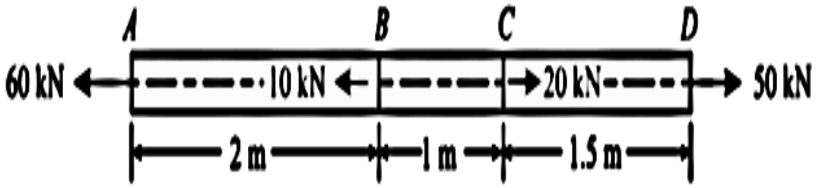
Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

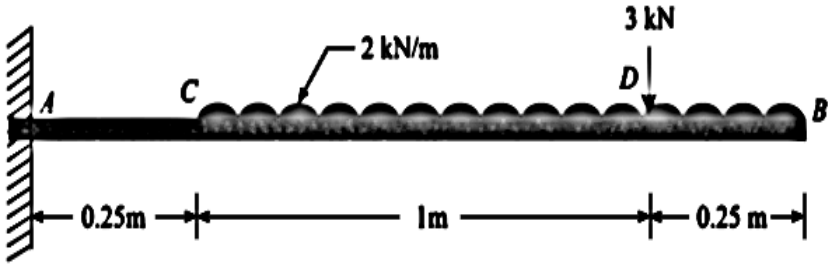
UNIT-I

1.	a)	Draw and explain the stress-strain curve for a ductile material. How the curve is different for a brittle material?	6 Marks	L2	CO1	PO1 PO2 PO3 PO4
	b)	A solid uniform metal bar of diameter **D** and length **L** is hanging vertically from its upper end. Obtain the total elongation of the bar due to its own weight, if γ is the density and **E** is the Young's modulus of the material of the bar.	6 Marks	L3	CO1	PO1 PO2 PO3 PO4

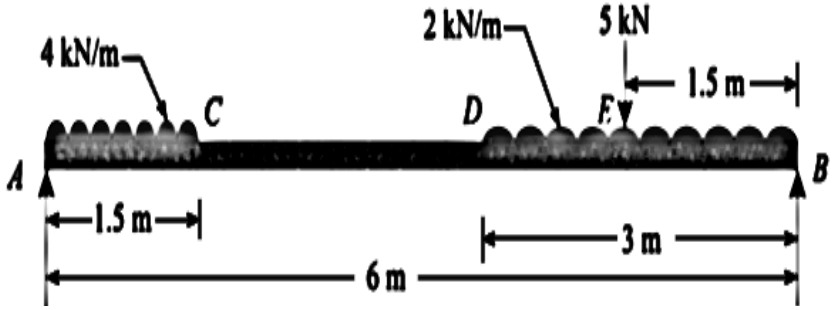
(OR)

2.	a)	A steel rod ABCD **4.5m** long and **25mm** in diameter is subjected to the forces as shown in figure. If the value of the young's modulus for the steel is **200GPa**, determine its deformation. 	6 Marks	L4	CO1	PO1 PO2 PO3 PO4
	b)	A reinforced concrete column **300mm x 300mm** has four reinforcing bars of **20mm** diameter one in each corner. When the column is loaded with **600kN** weight, find the stresses developed in the concrete and steel. Take $\mathbf{E_s / E_c = 15.}$	6 Marks	L4	CO1	PO1 PO2 PO3 PO4

UNIT-II

3.	a)	Explain the important relations between loading, shear force and bending moment at a point or between two sections of a beam.	4 Marks	L2	CO2	PO1 PO2 PO3 PO4 PO6 PO7
	b)	A cantilever **1.5m** long is loaded with a uniformly distributed load of **2kN/m** and a point load of **3kN** as shown in figure. Draw the shear force and bending moment diagrams for the cantilever. 	8 Marks	L4	CO2	PO1 PO2 PO3 PO4 PO6 PO7

(OR)

4.	a)	A simply supported beam **AB**, **6m** long is loaded as shown in figure. Construct the shear force and bending moment diagrams for the beam and find the position and value of maximum bending moment. 	4 Marks	L4	CO2	PO1 PO2 PO3 PO4 PO6 PO7
	b)	Define shear force and bending moment in beams and explain the sign convention used.	8 Marks	L2	CO2	PO1 PO2 PO3 PO4 PO6 PO7

UNIT-III

5.	a)	List any **6** assumptions used in theory of bending.	4 Marks	L1	CO2	PO1 PO2 PO3 PO4 PO6 PO7
	b)	Determine the maximum uniformly distributed load, a simply supported **40cm** deep and **20cm** wide timber beam can carry over a span of **4m**. The maximum permissible bending stress for the timber is **2N/mm^2**.	8 Marks	L4	CO2	PO1 PO2 PO3 PO4 PO6 PO7

(OR)

6.	a)	Derive the bending equation and explain how to find the position of neutral axis.	6 Marks	L5	CO2	PO1 PO2 PO3 PO4 PO6 PO7
	b)	A hollow steel pipe is of **150mm** external diameter and **100mm** internal diameter. If the stresses in tension and compression do not exceed **150N/mm^2** then what longest length of it can be supported freely at its ends? Unit weight of steel is **78kN/m^3**.	6 Marks	L4	CO2	PO1 PO2 PO3 PO4 PO6 PO7

UNIT-IV

7.	a)	Obtain relation for the Moment of resistance by a circular shaft subjected to a torque **T**.	4 Marks	L3	CO3	PO1 PO2 PO3 PO4 PO6
	b)	A solid shaft of **10cm** diameter transmits **74kW** at **150 rev/min**. Calculate (i) the torque on the shaft, (ii) the maximum shear stress developed, (iii) the angle of twist in length of **1.50m** and (iv) the shear stress at a radius of **3cm**. Take **C = 8MN/cm^2**	8 Marks	L4	CO3	PO1 PO2 PO3 PO4 PO6

(OR)

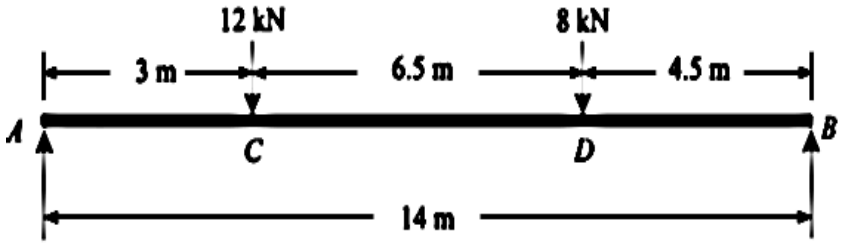
8.	a)	A short cast iron column of cross sectional area **4cm^2** carries an axial compressive load of **250kN**. For a plane inclined at **60^0** with the direction of the load, calculate the normal, the tangential and the resultant stresses and also the maximum shear stress and the obliquity of the resultant stress.	8 Marks	L4	CO3	PO1 PO2 PO3 PO4 PO6
	b)	Explain in detail the method of finding principal stresses using Mohr's circle for biaxial stresses.	4 Marks	L3	CO3	PO1 PO2 PO3 PO4 PO6

UNIT-V

9.	a)	Obtain a relation between curvature, slope and deflection of a beam.	4 Marks	L2	CO4	PO1 PO2 PO3 PO4
	b)	A simply supported beam **AB** of span of **5m** is carrying a point load of **30kN** at a distance **3.75m** from the left end **A**. Calculate the slopes at **A** and **B** and deflection under the load. Take **EI = 26 x 10^{12} N-mm^2**	8 Marks	L4	CO4	PO1 PO2 PO3 PO4

(OR)

10.		A horizontal steel girder having uniform cross section is **14m** long and is simply supported at its ends. It carries two concentrated loads as shown in figure. Using Macaulay's method, calculate the deflections of the beam under the loads **C** and **D**. Take **E = 200, GPa** and **I = 160 x 10^6 mm^4**	12 Marks	L4	CO4	PO1 PO2 PO3 PO4



CODE No.: 19BT30401 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

ELECTROMAGNETIC FIELDS AND TRANSMISSION LINES

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Derive an expression for the continuity equation and explain its significance.	6 Marks	L1	CO1	PO1
	b)	Point charges of 30 nC each are located at A(2, 0, 0), B(-2, 0, 0), C(0, 2, 0) and D(0, -2, 0) in free space. Find the total force on the charge at A.	6 Marks	L3	CO1	PO1
		(OR)				
2.	a)	Determine magnetic field intensity about an infinitely long straight current carrying filament and also sketch the resulting magnetic flux lines.	6 Marks	L2	CO1	PO2
	b)	The point charge Q = 18 nC has a velocity of 5 x 10^6 m/s in the direction $0.6\hat{a}_x + 0.75\hat{a}_y + 0.3\hat{a}_z$. Calculate the force exerted on the charge by the field $\bar{B} = \left(-3\hat{a}_x + 4\hat{a}_y + 6\hat{a}_z\right) mT$.	6 Marks	L3	CO1	PO1

UNIT-II

3.	a)	State and prove Maxwell's four equations for time varying fields.	6 Marks	L1	CO2	PO2
	b)	In a medium of conduction current density given by $\mathbf{J} = 6\cos(\omega t - 10z)\ \mathbf{a}_y + \sin(\omega t - 10z)\ \mathbf{a}_z$ mA/m^2, find the volume charge density.	6 Marks	L3	CO2	PO1
		(OR)				
4.	a)	Determine the boundary conditions for electrostatic fields at a conductor – dielectric interface.	6 Marks	L1	CO2	PO2
	b)	Derive boundary conditions for magnetostatic fields.	6 Marks	L1	CO2	PO2

UNIT-III

5.	a)	Derive expression for resultant fields due to oblique incidence of an EM wave on a perfect conductor.	6 Marks	L1	CO3	PO2
	b)	If there is a magnetic field represented by $B = 2\sin(\omega t - \beta x)\ \mathbf{a}_x + 2y\cos(\omega t - \beta x)\ \mathbf{a}_y$ in a medium where ρ_v=0, σ=0, J=0, find the electric field. Assume ε_r = 1 and μ_r=1.	6 Marks	L4	CO3	PO2
		(OR)				
6.	a)	Show that the ratio of E and H in a uniform plane wave is approximately equal to 377Ω.	6 Marks	L1	CO3	PO2
	b)	Discuss in detail the various ways in which a plane wave can be polarized.	6 Marks	L2	CO3	PO2

UNIT-IV

7.	a)	Starting from the equivalent circuit, derive the transmission line equation for V and I in terms of the source parameters and prove that $Z_o^2 = Z_{sc}\, Z_{oc}$	6 Marks	L2	CO4	PO2
	b)	Find the input impedance of a 75Ω lossless transmission line of length 0.2λ, if it is terminated in a short circuit.	6 Marks	L3	CO4	PO2
		(OR)				

8.	a)	Derive an expression for the relation between reflection coefficient, load and characteristic impedance.	6 Marks	L1	CO4	PO2
	b)	A lossy line which has $R = 2.5\ \Omega$ /m, $L = 1.0$ mH/m, $C = 1$ pF/m, and $G = 0$ operates at $f = 1.5$ GHz. Find the attenuation constant of the line.	6 Marks	L3	CO4	PO1

UNIT-V

9.	a)	List out the various applications of a Smith chart.	6 Marks	L1	CO4	PO1
	b)	A lossless transmission line is terminated in a load impedance of $30 - j\ 25\Omega$. Find the phase constant and the reflection coefficient of a line of length 50m. Characteristic impedance $z_0 = 50\ \Omega$. Wavelength on the line = 0.40m.	6 Marks	L3	CO4	PO2

(OR)

10.	a)	Explain how single stub matching is carried out using a Smith chart.	6 Marks	L2	CO4	PO2
	b)	Find the input impedance of a 75Ω lossless transmission line of length 0.2λ. if it is terminated in an open circuit using Stub matching.	6 Marks	L4	CO4	PO3

CODE No.: 19BT30402 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

ELECTRONIC DEVICES AND CIRCUITS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define the time constant τ of an RC high-pass filter. What is the physical significance of this parameter? When do we treat a transient to have reached its steady state value?	6 Marks	L1	CO1	PO1
	b)	Define rise time t_r of an RC low-pass filter and show that $t_r = 2.2RC$.	6 Marks	L3	CO1	PO1
		(OR)				
2.	a)	Draw the transfer characteristics and explain the operation of a two way clipper.	6 Marks	L2	CO1	PO1
	b)	A symmetrical square wave whose peak to peak amplitude is 2V and whose average value is zero is applied to an RC integrating circuit. The time constant equals the half period of the square wave. Find the peak to peak value of the output amplitude.	6 Marks	L3	CO1	PO2

UNIT-II

3.	a)	What is biasing? Explain the need of it. List out different biasing techniques.	6 Marks	L2	CO2	PO1
	b)	An n-p-n transistor with $\beta = 50$ is used in a common emitter circuit with $V_{CC} = 10V$ and $R_C = 2K$. The bias is obtained by connecting a 100K resistance from collector to base. Assume $V_{BE} = 0$. Find: i) Quiescent point. ii) Stability factor S.	6 Marks	L3	CO2	PO2
		(OR)				
4.	a)	Differentiate bias stabilization and compensation techniques.	6 Marks	L4	CO2	PO1
	b)	Discuss the operation of thermistor compensation.	6 Marks	L2	CO2	PO1

UNIT-III

5.	a)	Why Hybrid parameters are called so? Define them.	6 Marks	L1	CO3	PO1
	b)	Draw the ac equivalent of a CE amplifier with fixed bias using h–parameter model and derive the equations for input impedance, output impedance, voltage gain and current gain.	6 Marks	L3	CO3	PO3
		(OR)				
6.	a)	Derive the equations for voltage gain, current gain, input impedance and output admittance for a BJT using low frequency h – parameter model for CE configuration.	6 Marks	L3	CO3	PO3
	b)	A CE amplifier is drawn by a voltage source of internal resistance $R_s = 1000\Omega$ and the load impedance is a resistance $R_L = 1200\Omega$. The h-parameters are $h_{ie} = 1.2K\Omega$, $h_{re} = 0.0002$, $h_{fe} = 60$ and $h_{oe} = 25\mu A/V$. Compute the current gain A_I, input resistance R_i, Voltage gain A_V and output resistance R_o using approximate analysis.	6 Marks	L3	CO3	PO2

UNIT-IV

7.	a)	Sketch and explain the drain and transfer characteristics of JFET in detail.	6 Marks	L3	CO4	PO1
	b)	Explain the construction and operation of p-channel EMOSFET with the help of static drain characteristics and transfer characteristics.	6 Marks	L2	CO4	PO1
		(OR)				
8.	a)	With the help of neat sketch, explain voltage divider biasing of JFET.	6 Marks	L2	CO4	PO1
	b)	Draw the circuit diagram of common drain amplifier and derive the expression for voltage gain and input resistance.	6 Marks	L3	CO4	PO1

UNIT-V

9.	a)	With a neat sketch, explain the principal of operation of tunnel diode.	6 Marks	L3	CO5	PO1
	b)	Explain the working principle of DIAC and list the applications.	6 Marks	L2	CO5	PO1
		(OR)				
10.	a)	Describe the working of UJT as relaxation oscillator.	6 Marks	L2	CO5	PO1
	b)	Explain the working of varactor diode and list its applications.	6 Marks	L2	CO5	PO1

CODE No.: 19BT30403 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

SIGNALS AND SYSTEMS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

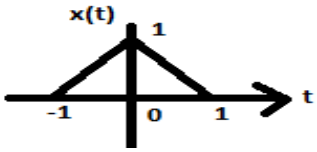
1.	a)	Illustrate the following classifications of continuous time sequences with examples. i) Static and Dynamic systems. ii) Time variant verses and Time in-variant systems.	6 Marks	L1	CO1	PO2
	b)	Given a signal. $x(t) = t+2 \quad -2 < t < 2$ $= 0 \quad$ otherwise. Plot the following signals x(2t), x(-t), x(t/2), 2 x(-2t+3).	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Test whether the following signals are periodic signals or aperiodic signals. In case of periodic signals, determine the fundamental frequencies. i) $x(t) = 2\sin(2/3)t + 3\cos(2\pi/5)t$. ii) $x(t) = 4\cos(3\pi t+\pi/2) + 2\sin(8\pi t+\pi/2)$.	6 Marks	L2	CO1	PO2
	b)	Find the energy of a rectangular pulse having unit height and unit width centered at origin. Suppose now this signal is shifted right side (or left side) by 1 unit. Find the new signals energy and power. Is there any change in the value of energy calculated? Give the reasons.	6 Marks	L3	CO1	PO2

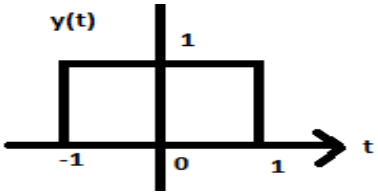
UNIT-II

3.	a)	i) State and prove the Time Reversal property of Fourier Transform ii) Using that property find *x(t) = u(t) + u(-t)*	6 Marks	L1	CO2	PO1
	b)	Find the Fourier Transform of $x(t) = e^{-at}u(t)$.	6 Marks	L2	CO2	PO1
		(OR)				
4.		State and prove convolution property in Fourier Transform.	12 Marks	L2	CO2	PO2

UNIT-III

5.	a)	State and prove Parsevals's theorem. Explain its physical significance.	6 Marks	L1	CO3	PO1
	b)	A filter has an input $x(t) = e^{-2t}u(t)$ and Transfer function $H(w) = \frac{1}{1+jw}$ and find the ESD of the output.	6 Marks	L1	CO3	PO1
		(OR)				
6.	a)	Fine the relation between convolution and correlation with examples.	6 Marks	L1	CO3	PO1
	b)	Fine the cross correlation between unit triangular and unit gate pulse.	6 Marks	L1	CO3	PO5





UNIT-IV

7.	a)	The step response of an LTI system is found to be $2e^{-3t}u(t)$ i) Find the impulse response h(t) of the system. ii) Find the response of the system when the input is $e^{-t}u(t)$.	6 Marks	L3	CO4	PO2
	b)	Find the Laplace Transform of the signal $x(t) = e^{-2t}u(-t) + e^{-3t}u(-t)$ and also find its ROC.	6 Marks	L2	CO4	PO2
		(OR)				
8.	a)	Using properties of Laplace Transform find: i) $x(t) = te^{-t}u(t)$. ii) $x(t) = e^{-2t}\cos(2\pi 100t)u(t)$.	6 Marks	L2	CO4	PO2
	b)	Find the inverse Laplace Transform of the following : $X(S) = \frac{S+1}{(S+1)(S+1)+4}$.	6 Marks	L1	CO4	PO1

UNIT-V

9.	a)	State and prove Sampling theorem.	6 Marks	L1	CO5	PO1
	b)	An amplifier with Gain = 30dB and Bandwidth = 25KHZ is found to have T = 120K. Noise figure = 2. Find output noise.	6 Marks	L3	CO5	PO4
		(OR)				
10.	a)	Explain the reconstruction of a signal from its samples using interpolation technique.	6 Marks	L2	CO5	PO2
	b)	List out different types of Noises.	6 Marks	L3	CO5	PO4

CODE No.: 19BT30404 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

SWITCHING THEORY AND LOGIC DESIGN

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Express the function $F = A + \overline{B}C$ in canonical SOP and POS.	6 Marks	L2	CO1	PO1
	b)	List the first 16 numbers in base 12; use the letters A and B to represent the last two digits. Convert the number $(456)_{12}$ to base 8	6 Marks	L3	CO1	PO3
		(OR)				
2.	a)	Generate even parity hamming code for the data word 10011010.	4 Marks	L4	CO1	PO4
	b)	i) Simplify the given Boolean expression $f = ABC + \overline{A}\,\overline{B}\,C + A\overline{B} + AB\overline{C} + \overline{A}\overline{B}\overline{C}$.	8 Marks	L2	CO1	PO2
		ii) Perform the subtraction using 10^{th} complements. i) $(1000)_{10}$-$(756)_{10}$. ii) $(10)_{10} - (100)_{10}$.				
		UNIT-II				
3.	a)	Implement the following function in multi-level NAND $F = ABC + ABC + ABD + ABD$.	6 Marks	L3	CO1	PO2
	b)	Obtain the simplified expression in POS, implement with NOR gates $F(w,x,y,z) = \sum_m (1, 2, 4, 11, 12, 13) + \sum_d (0, 3, 6, 10)$.	6 Marks	L4	CO1	PO4
		(OR)				
4.	a)	Determine essential prime implicates given Boolean expression using tabulation method $F = ACD + BCD + BCD + ACD$.	6 Marks	L3	CO1	PO2
	b)	Simplify the expression in SOP $F(w,x,y,z) = \sum_m (0, 3, 4, 5, 7) + \sum_d (8, 9, 10, 11, 12, 13, 14, 15)$.	6 Marks	L4	CO1	PO4
		UNIT-III				
5.	a)	Implementing the logic function using a multiplexer 2^{N-1} input line, where N is the number of variables in the function $F(A, B, C, D) = \sum_m (4, 5, 6, 7, 8, 13, 14, 15)$.	6 Marks	L3	CO1	PO4
	b)	Define encoder. Design Octal to Binary encoder.	6 Marks	L4	CO2	PO2
		(OR)				
6.	a)	Design a BCD to Decimal Adder Combinational circuit.	6 Marks	L2	CO2	PO1
	b)	Construct 5 to 32 decoder using one 2 to 4 decoder and four 3 to 8 decoders.	6 Marks	L4	CO2	PO2
		UNIT-IV				
7.	a)	Convert JK Flip Flop to T Flip Flop.	6 Marks	L3	CO2	PO3
	b)	Design a Universal Shift Register and explain the operation with neat diagram.	6 Marks	L3	CO1	PO6
		(OR)				
8.	a)	Design 3 Bit UP/Down Synchronous counter using T Flip Flop.	6 Marks	L3	CO2	PO6
	b)	Design a 5 Bit Ring counter and explain the operation.	6 Marks	L3	CO2	PO6

UNIT-V

9.	a)	A combinational circuit is defined by the function $F_1(A, B, C) = \sum_m (3, 5, 6, 7)$ $F_2=\sum_m (0, 2, 4,7)$. Implement the circuit with PLA having 3 inputs, 4 product terms and two outputs.	6 Marks	L3	CO3	PO2
	b)	Realize a Logic function using $F (A, B, C) = \Sigma_m (2, 4, 5, 6)$ using Hazard Free logic gate network.	6 Marks	L2	CO3	PO7
		(OR)				
10.	a)	Distinguish the following. i) PROM. ii) PAL. iii) PLA.	6 Marks	L1	CO4	PO2
	b)	Implement the following function using PROM $F_1(A, B, C) = \sum_m (0, 1, 2)$ $F_2=\sum_m (4, 5, 6, 7)$.	6 Marks	L3	CO3	PO2

CODE No.: 19BT30501 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

COMPUTER GRAPHICS

[Computer Science and Engineering, Information Technology]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Compare and contrast raster scan systems and random scan systems.	6 Marks	L4	CO1	PO1
	b)	Write an algorithm to draw a line using Bresenhams approach.	6 Marks	L1	CO2	PO2
		(OR)				
2.	a)	Illustrate the working of a CRT with neat sketch.	6 Marks	L2	CO1	PO1
	b)	Discuss in detail input devices.	6 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Differentiate boundary fill algorithm and flood fill algorithm.	6 Marks	L4	CO2	PO2
	b)	What is the use of homogeneous coordinates in transformations? Explain in detail.	6 Marks	L2	CO3	PO2
		(OR)				
4.	a)	Derive a transformation matrix to rotate an object with respect to a given point.	6 Marks	L3	CO3	PO3
	b)	Explain in detail composite transformations.	6 Marks	L2	CO3	PO1
		UNIT-III				
5.	a)	Discuss in detail window-to-viewport coordinate transformation.	6 Marks	L2	CO3	PO1
	b)	Apply Cohen-Sutherland line clipping algorithm for the line having end points A(-1, 5) and B(3, 8) against window coordinates (-3, 1) and (2, 6).	6 Marks	L3	CO3	PO3
		(OR)				
6.	a)	What is a polygon surfaces? Explain in detail.	6 Marks	L1	CO3	PO1
	b)	Explain the properties of Bezier curves.	6 Marks	L2	CO3	PO2
		UNIT-IV				
7.	a)	Discuss in detail basic 3D transformations.	6 Marks	L1	CO3	PO1
	b)	Illustrate 3D viewing pipeline.	6 Marks	L1	CO3	PO1
		(OR)				
8.	a)	Differentiate parallel projection and perspective projection.	6 Marks	L4	CO3	PO2
	b)	Write a short note on clipping in 3D.	6 Marks	L2	CO3	PO1
		UNIT-V				
9.	a)	What is an illumination model? Discuss in detail.	6 Marks	L2	CO4	PO2
	b)	Explain Back-face detection with an example.	6 Marks	L2	CO4	PO2
		(OR)				
10.	a)	Discuss in detail Scan-line method.	6 Marks	L2	CO4	PO2
	b)	What is surface rendering? Explain Gouraud shading method.	6 Marks	L2	CO4	PO2

CODE No.: 19BT30502 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

COMPUTER ORGANIZATION

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	i) Identify possible values of x and y, if 73_x (in base-x system) is equal to 54_y (in base y number system). ii) An electronic device which converts one form of data into another form under the control of a program. To design such electronic device, what are the functional blocks required? Discuss with a neat sketch.	6 Marks	L1	CO1	PO2
	b)	Provide significance of distinct number systems. Identify why binary number system is more suitable for digital computers with respective to other number systems. And convert $(4675)_{16}$, $(A467B89)_{16}$, $(5371)_8$ and $(7856)_{10}$ to binary numbers.	6 Marks	L2	CO1	PO2
		(OR)				
2.		The instruction at address 021 in the basic computer has I = 0; an opcode of AND instruction address part is 083 the memory word at address 083 contains operand B8F2 and content of AC is A937. Determine the contents of PC, AR, DR, AC and IR. Repeat the problem 6 more times for all memory reference instructions.	12 Marks	L4	CO2	PO2
		UNIT-II				
3.	a)	What is a program status word? If the last operation performed on a computer with an 8-bit word was an addition in which the two operands were 00010110 and 01100011, what would be the value of the following flags? i) Carry. ii) Zero. iii) Overflow. iv) Sign. v) Even Parity.	5 Marks	L2	CO3	PO1
	b)	Briefly discuss the basic instruction cycle of processor.	7 Marks	L2	CO2	PO1
		(OR)				
4.	a)	The following transfer statements specify a memory. Explain the memory operation in each case. i) R1←M[AR] ii) M[AR]←R4 iii) R1←M[R3]	3 Marks	L3	CO3	PO2
	b)	What is DMA? Explain DMA transfer methods.	9 Marks	L2	CO2	PO1

UNIT-III

5.	a)	What are the different types of I/O subsystems? Report the flow chart of the I/O subsystem that is driven by interrupts.	6 Marks	L2	CO2	PO1
	b)	A System uses a control memory of 1024 words of 32 bits each. Micro Instruction has three fields. The Micro operation field has 16 bits. i) How many bits are there in branch address field and select field. ii) If there are 16 status bits in the system, how many bits of branch logic are used to select a status bit? iii) How many bits are left to select an input for the multiplexers?	6 Marks	L3	CO4	PO3

(OR)

6.	a)	What happens in the daisy-chain priority interrupt when device 1 requests an interrupt after device 2 has sent an interrupt request to the CPU but before the CPU responds with the interrupt acknowledge? Explain with relevant diagrams.	6 Marks	L2	CO3	PO2
	b)	Explain how communication between CPU and IOP takes place with flowchart.	6 Marks	L2	CO2	PO1

UNIT-IV

7.	a)	What is Hit ratio in cache memory and explain about Direct mapping in cache?	6 Marks	L2	CO3	PO1
	b)	How many bits will be for tag, index, block and word field of address format?	6 Marks	L3	CO2	PO1

(OR)

8.		Discuss the strobe control method for Asynchronous data transfer between source unit and destination unit.	12 Marks	L2	CO3	PO2

UNIT-V

9.	a)	Illustrate the terms arithmetic pipeline and instruction pipeline and write short notes on them.	6 Marks	L2	CO3	PO1
	b)	Explain about Hardware Performance issues.	6 Marks	L2	CO3	PO1

(OR)

10.	a)	Discuss about Inter-processor arbitration.	6 Marks	L2	CO2	PO2
	b)	Explain design issues of instruction pipeline.	6 Marks	L2	CO2	PO1

CODE No.: 19BT30503 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

DATA STRUCTURES

[Computer Science and Engineering, Information Technology]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define time complexity. Discuss the O (Big oh) notation with an example.	4 Marks	L2	CO1	PO2
	b)	Define a singly linked list. Write a program to perform merging of two sorted linked lists.	8 Marks	L3	CO1	PO3
		(OR)				
2.	a)	Compare and contrast the arrays and linked lists.	4 Marks	L2	CO1	PO2
	b)	List the advantages of circular linked lists over singly linked lists. Explain how the insertion and deletion operations are performed at the specified position of the circular linked list.	8 Marks	L1	CO1	PO2

UNIT-II

3.	a)	Define a stack. Explain the implementation of the stack using linked lists.	8 Marks	L3	CO1	PO3
	b)	Convert the given infix expression to postfix ((A+B)*C) / D-E*F+G.	4 Marks	L4	CO4	PO2
		(OR)				
4.	a)	How circular queue is advantageous over linear queue? Write its implementation.	6 Marks	L3	CO1	PO3
	b)	Discuss the priority queues in detail with an example.	6 Marks	L2	CO1	PO2

UNIT-III

5.	a)	A binary tree has seven nodes. The Preorder and Postorder traversals of the tree are given below. Can you draw the tree? Justify. Preorder: GFDABEC. Postorder : ABDCEFG.	6 Marks	L2	CO2	PO1
	b)	Define the red-black tree. Write about how we implement red-black trees.	6 Marks	L3	CO2	PO3
		(OR)				
6.	a)	Explain binary tree traversals with an example.	6 Marks	L2	CO4	PO1
	b)	Write an algorithm to insert a node in a Binary Search Tree.	6 Marks	L3	CO2	PO3

UNIT-IV

7.	a)	Construct the step by step procedure to sort the given list of elements using Quick Sort { 54,26,93,17,77,3,44,55,20}.	8 Marks	L3	CO3	PO2
	b)	Write an algorithm for Linear Search and analyze its time complexity.	4 Marks	L4	CO3	PO2
		(OR)				
8.	a)	Describe the insertion sort algorithm and trace the steps of insertion sort for sorting the list - 12, 19, 33, 26, 29, 35, 22, 37. Find the total number of comparisons made.	6 Marks	L3	CO3	PO2
	b)	Write an algorithm for binary search. Illustrate the search process to find an element 15, if the list of numbers given are: 5, 15, 23, 39, 46, 57, 61, 77, 89.	6 Marks	L2	CO3	PO2

UNIT-V

9.	a)	Describe in detail about breadth-first traversal of a graph with a suitable example.	6 Marks	L2	CO4	PO1
	b)	Construct and discuss any two collision avoiding techniques.	6 Marks	L3	CO2	PO3
		(OR)				
10.	a)	Define the spanning tree. Illustrate the steps for finding minimum spanning tree for the given graph with an example.	6 Marks	L2	CO2	PO1
	b)	Solve**:** Given the input (322, 134, 141, 969, 1979, 611, 6172, 4199) and hash function h(x) = x mod 10, show the resulting. i) Separate Chaining, ii) Closed hashing using linear probing and double hashing h2(x) = 8-(x mod 8).	6 Marks	L4	CO2	PO3

CODE No.: 19BT31001 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

ELECTRICAL AND ELECTRONICS MEASUREMENTS

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Define damping and discuss the types of damping used in analog meters.	6 Marks	L1	CO1	PO1
	b)	List out different errors in PMMC and state the advantages and disadvantages of it.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Derive the Torque equation of Moving Iron Instruments.	6 Marks	L2	CO1	PO3
	b)	Design a multi-range ammeter for the ranges 10mA, 50mA and 75mA using a D'Arsonval movement having an internal coil resistance of 50Ω at a maximum current of 1mA.	6 Marks	L4	CO2	PO4
		UNIT-II				
3.	a)	Classify Ohmmeters and discuss in detail any one of it.	6 Marks	L2	CO1	PO5
	b)	Design a shunt type ohmmeter for which the basic D'Arsonval movement with 10 mA and internal resistance of 5Ω. The battery **emf** is 3V. It is desires to modify the circuit by adding appropriate shunt resistances across the movement, so that instrument indicates 0.5Ω at the midpoint on its scale. Calculate value of shunt resistance and value of limiting resistor R_L.	6 Marks	L3	CO1	PO2
		(OR)				
4.	a)	Classify the types of AC potentiometer and discuss their applications.	6 Marks	L2	CO2	PO2
	b)	Demonstrate how multimeter can measure voltage and current.	6 Marks	L1	CO2	PO8
		UNIT-III				
5.	a)	Explain the construction and working principle of Electrodynamometer wattmeter.	6 Marks	L1	CO1	PO1
	b)	Discuss in detail about Polyphase energy meter.	6 Marks	L2	CO2	PO5
		(OR)				
6.		In a dynamometer wattmeter the moving coil has 500 turns of mean diameter of 30mm, estimate the torque if the axes of the field and moving coils are at 60^0 and 90^0 when the density in the field coils is 15×10^{-3} Wb/m^2, the current in moving coil is 0.05 A and the power factor is 0.866.	12 Marks	L1	CO1	PO1
		UNIT-IV				
7.	a)	Explain the significance of balance condition in the Wheatstone Bridge and derive the expression.	6 Marks	L2	CO3	PO2
	b)	Discuss in detail about the operation of Q-meter.	6 Marks	L2	CO3	PO2
		(OR)				
8.	a)	Design a bridge used for measurement of low value inductance and derive its balance equation.	6 Marks	L6	CO3	PO1
	b)	Interpret about the sources and detectors used in bridge circuits.	6 Marks	L1	CO3	PO1

UNIT-V

9.	a)	Discuss in detail about Frequency synthesizer.	6 Marks	L4	CO4	PO1
	b)	With a neat sketch, explain the operation of digital frequency meter.	6 Marks	L2	CO4	PO1
		(OR)				
10.	a)	With a neat sketch, explain the block diagram of Universal Time Counter.	6 Marks	L2	CO4	PO1
	b)	Analyze how universal counter can be used to measure time and ratio.	6 Marks	L4	CO4	PO1

CODE No.: 19BT31002 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

TRANSDUCERS IN INSTRUMENTATION

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the generalized measurement system with a neat block diagram.	6 Marks	L2	CO1	PO1
	b)	What are the different errors encountered in measurements? Explain with suitable examples.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Define and explain briefly the dynamic characteristics of transducers.	6 Marks	L2	CO1	PO2
	b)	The observations of resistance made in an experiment are 100.4Ω, 99.2Ω, 101.1Ω, 100.5Ω, 99.8Ω, 102.0Ω, 99.9Ω, 101.7Ω, 100.8Ω, 101.2Ω. Calculate the arithmetic mean, standard deviation and variance.	6 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	Derive the expression of Gauge Factor of strain gauge.	6 Marks	L2	CO2	PO1
	b)	Discuss any one societal application of ultrasonic sensors.	6 Marks	L2	CO2	PO6
		(OR)				
4.	a)	Explain the working principle of Hall effect with an example.	6 Marks	L2	CO2	PO1
	b)	Outline the principles of capacitive sensors with neat sketches.	6 Marks	L2	CO2	PO1
		UNIT-III				
5.	a)	Identify suitable temperature sensor for very high temperature measurement applications.	6 Marks	L2	CO3	PO5
	b)	Analyze various performance characteristics of different temperature sensors.	6 Marks	L4	CO3	PO2
		(OR)				
6.	a)	Elucidate the laws of thermocouple and explain clearly about cold junction compensation.	6 Marks	L2	CO3	PO2
	b)	The typical value of Beta for a thermistor around 25^0C is 4000K. Find the corresponding resistance–temperature coefficient for a thermistor.	6 Marks	L3	CO3	PO2
		UNIT-IV				
7.	a)	Identify and explain a suitable load cell for industrial applications.	6 Marks	L2	CO4	PO3
	b)	Analyze the various velocity and acceleration sensors.	6 Marks	L2	CO4	PO2
		(OR)				
8.	a)	Explain the working principle of electromagnetic type velocity measurement.	6 Marks	L2	CO4	PO1
	b)	Outline the digital methods for torque measurement.	6 Marks	L2	CO4	PO2
		UNIT-V				
9.	a)	Explain the working principle of SAW sensor.	6 Marks	L2	CO2	PO1
	b)	Select suitable sensor for vibration measurement in industrial applications.	6 Marks	L2	CO4	PO2
		(OR)				
10.	a)	Demonstrate the working of various types of gyroscopes.	6 Marks	L2	CO2	PO1
	b)	Compare incremental and absolute encoders.	6 Marks	L2	CO2	PO2

CODE No.: 19BT31201 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

DISCRETE MATHEMATICAL STRUCTURES

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	What is a tautology? Prove **[(p∧~q)→r] → [p → (q ∨ r)]** is a tautology.	6 Marks	L2	CO1	PO2
	b)	Give a contradiction proof that the square root of 2 is not a rational.	6 Marks	L4	CO1	PO1
		(OR)				
2.	a)	Prove (or) disprove the validity of the following argument. Every living thing is a plant or animal. Davids dog is alive and it is not a plant. All animals have hearts. Hence, David's dog has a heart.	6 Marks	L3	CO1	PO2
	b)	Obtain the PDNF of **: P→((P→Q) ∧ ~(~Q ∨ P))**	6 Marks		CO1	PO2
		UNIT-II				
3.	a)	What is a Equivalence relation? Let X={1,2,3,4} and R={(1,1), (1,4), (4,1), (4,4), (2,2), (2,3), (3,2), (3,3)} Determine whether the relation R is equivalence or not.	6 Marks	L2	CO2	PO1
	b)	Draw the Hasse – diagram for the post [D_{32};/]. Where '/' is the divisibility relation. Determine this poset is lattice or not.	6 Marks	L4	CO2	PO2
		(OR)				
4.	a)	Discuss in detail properties of Binary relations.	6 Marks	L2	CO2	PO4
	b)	Let A={1,2,3,4,5,6}, Construct pictorial descriptions of the relation R on A for the following cases: i) R = {(j, k) | j is a multiple of k}. ii) R = {(j, k) | j / k is a prime }.	6 Marks	L3	CO2	PO2
		UNIT-III				
5.	a)	Explain the general properties of Algebraic System.	6 Marks	L2	CO3	PO4
	b)	Discuss the Homomorphism with suitable examples.	6 Marks	L2	CO3	PO4
		(OR)				
6.	a)	Examine whether given set P={0,1,2,3,4,5,6,8) can be semi group under binary operation θ_6 or not.	6 Marks	L3	CO3	PO4
	b)	Discuss in detail Isomorphism with suitable examples.	6 Marks	L2	CO3	PO4
		UNIT-IV				
7.	a)	State and explain Pigeon – hole principle and its applications.	6 Marks	L2	CO4	PO2
	b)	Find the coefficient of X^{25} in $(X^2+X^3+X^4+X^5+X^6)^7$.	6 Marks	L5	CO4	PO2
		(OR)				
8.	a)	In how many ways can the committee of 5 teachers and 4 students be chosen from 9 teachers and 15 students be formed if teacher A refuses to serve if student B is on the committee?	6 Marks	L4	CO4	PO2
	b)	Solve the recurrence relation: $a_n + a_{n-1} - 6a_{n-2} = 0$ where $a_0 = -1$, $a_1 = 8$.	6 Marks	L3	CO4	PO2

UNIT-V

9.	a)	Show that a complete graph K_n is planar iff $n \leq 4$. (Using Euler's)	6 Marks	L4	CO5	PO2
	b)	Define the Euler Path and determine whether the graph (G_1) is Euler circuit or not?	6 Marks	L3	CO5	PO2

(G_1)

(OR)

10	a)	Discuss Prim's spanning tree algorithm with suitable example.	6 Marks	L2	CO5	PO2
	b)	Discuss the difference between DFS and BFS with suitable examples.	6 Marks	L2	CO5	PO2

CODE No.: 19BT31202 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

SOFTWRE ENGINEERING

[Information Technology]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	What are the phases of software development? Explain in detail.	6 Marks	L1	CO1	PO1
	b)	List the major phases in the waterfall model and the spiral model. Where is the spiral model beneficial? Justify your answer.	6 Marks	L3	CO1	PO1
		(OR)				
2.	a)	What is a prototype model? Under what circumstances is it beneficial to construct a prototype model? Give reasons.	6 Marks	L1	CO1	PO1
	b)	Analyze about the Agile process model and the Scrum process model.	6 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	What is a software requirement? Explain the process of determining the requirements.	6 Marks	L1	CO2	PO1
	b)	Define Requirement Engineering. Categorize seven distinct tasks to fulfill the needs of the project.	6 Marks	L2	CO2	PO2
		(OR)				
4.	a)	Discuss briefly the unified process that is used in designing object-oriented software.	6 Marks	L1	CO2	PO1
	b)	What is SRS? Explain the need for SRS and also list the five desirable characteristics of a good SRS document.	6 Marks	L2	CO2	PO1
		UNIT-III				
5.	a)	Discuss the various OO design issues in software engineering.	6 Marks	L1	CO2	PO1
	b)	Explain briefly about the software architecture style and architecture pattern.	6 Marks	L2	CO3	PO1
		(OR)				
6.	a)	What are cohesion and coupling and what is their purpose in software reconstruction? Elucidate.	6 Marks	L1	CO3	PO2
	b)	Write short notes on: i) Modularity. ii) Reusability. iii) Data dictionary.	6 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	What are the various testing strategies for software testing? Describe them briefly.	6 Marks	L1	CO4	PO2
	b)	Write short notes on the following with suitable examples. i) Graph-Based testing methods. ii) Equivalence Partitioning.	6 Marks	L1	CO4	PO3
		(OR)				
8.	a)	Differentiate between function-oriented and size-oriented metrics	6 Marks	L2	CO3	PO2
	b)	What is cyclomatic complexity? Explain how to construct a flow graph for a program (Fibonacci series) and compute cyclomatic complexity with an example.	6 Marks	L3	CO3	PO3

UNIT-V

9.	a)	List the major risks in a software project. What are the methods to reduce the risk of cost and schedule overruns? Give reasons.	6 Marks	L3	CO5	PO2
	b)	Discuss the role of RMMM in the software development process.	6 Marks	L1	CO5	PO1
		(OR)				
10.	a)	Write short notes on Quality function deployment in software quality assurance.	6 Marks	L1	CO5	PO1
	b)	Distinguish between forward and reverse engineering.	6 Marks	L2	CO5	PO2

CODE No.: 19BT31501 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

DATA STRUCTURES AND ALGORITHMS

[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Apply the Insertion Sort algorithm on following elements: 445, 3, 657, 10, 27, 35, 290, 55, 35, 310.	6 Marks	L3	CO2	PO5
	b)	Describe the importance of Performance analysis with suitable examples. i) Space Complexity. ii) Time Complexity.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Explain the Radix sort algorithm with a detailed example.	6 Marks	L2	CO2	PO2
	b)	Differentiate between the Linear search and Binary search.	6 Marks	L3	CO2	PO5
		UNIT-II				
3.	a)	Write a program how to implement the Double Linked List concepts of Insertion and deletion.	6 Marks	L2	CO3	PO1
	b)	Explain the concept of circular linked list in detail with an example.	6 Marks	L3	CO3	PO3
		(OR)				
4.	a)	Write a program to implement and compare of two single linked lists i.e list1 and list2.	6 Marks	L6	CO3	PO3
	b)	Differentiate between Double Linked List and Circular Linked List.	6 Marks	L3	CO4	PO2
		UNIT-III				
5.	a)	Write a program to implement stacks using Linked List, Mention any three applications of stacks.	6 Marks	L3	CO4	PO5
	b)	Convert the following infix expression to postfix expression (a +b * (c / d)) / ((e + f)* (g - h)).	6 Marks	L3	CO4	PO3
		(OR)				
6.	a)	Write a program to implement Queues by using arrays. Mention any three applications of Queues.	6 Marks	L2	CO4	PO2
	b)	List out the operations of Circular Queue, Priority Queue and Deque in detail.	6 Marks	L3	CO4	PO5
		UNIT-IV				
7.	a)	Explain in detail the representation of Binary Tree and terminologies of Binary Tree.	6 Marks	L3	CO5	PO5
	b)	Mention the concept of insertion operation on Binary Search Tree with a neat example.	6 Marks	L2	CO5	PO3
		(OR)				
8.	a)	Describe the importance of AVL trees and explain with suitable examples the insertion and deletion operations.	6 Marks	L6	CO5	PO5
	b)	Analyze the importance of implementation of Heap Trees and its applications in detail.	6 Marks	L3	CO5	PO2

UNIT-V

9.	a)	Explain the concept of B+ Tree and demonstrate the insertion operation in B+tree in detail.	6 Marks	L3	CO5	PO5
	b)	Differentiate between the Graphs and Trees in detail.	6 Marks	L2	CO5	PO3
		(OR)				
10.	a)	Write a program to implement Depth First Search algorithm and its complexity analysis.	6 Marks	L2	CO5	PO2
	b)	Mention the Hash Table Structure and its applications in detail.	6 Marks	L3	CO5	PO5

CODE No.: 19BT31502 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

OPERATING SYSTEMS

[Computer Science and Engineering, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define Operating System. List the objectives of an operating system.	4 Marks	L1	CO1	PO1
	b)	Define a Thread. Give the benefits of multithreading. What resources are used when a thread is created? How do they differ from those used when a process is created?	8 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Summarize Round Robin scheduling algorithm with a suitable example.	6 Marks	L2	CO1	PO5
	b)	Describe IPC. Explain in detail the inter process communication models.	6 Marks	L1	CO1	PO4

UNIT-II

3.	a)	Illustrate Critical Section problem. Give the conditions that a solution to the critical section problem must satisfy.	6 Marks	L4	CO2	PO2
	b)	Explain semaphore. List the types of semaphores and show that, if the wait( ) and signal( ) semaphore operations are not executed atomically, then mutual exclusion may be violated.	6 Marks	L4	CO2	PO4
		(OR)				
4.	a)	Explain the Resource-Allocation-Graph algorithm for deadlock avoidance.	6 Marks	L4	CO2	PO2
	b)	Define Monitor. Give the schematic view of the basic monitor.	6 Marks	L1	CO2	PO2

UNIT-III

5.	a)	Define Thrashing. What is the cause of Thrashing? How does the system detect Thrashing? What can the system do to eliminate this problem?	6 Marks	L1	CO3	PO2
	b)	Identify various issues involved in selecting appropriate disk scheduling algorithm.	6 Marks	L2	CO3	PO2
		(OR)				
6.	a)	Consider the following page reference string: 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6. How many page faults would occur for the optimal page replacement algorithm, assuming three frames and all frames are initially empty?	8 Marks	L3	CO3	PO3
	b)	Explain how demand paging affects the performance of a computer system.	4 Marks	L4	CO3	PO2

UNIT-IV

7.	a)	Explain various file access methods with suitable examples.	6 Marks	L4	CO4	PO2
	b)	List out various algorithms in directory implementation.	6 Marks	L1	CO4	PO2
		(OR)				
8.	a)	Explain the three allocation methods in file system implementation. Illustrate with proper diagram.	8 Marks	L4	CO4	PO2
	b)	Define Kernel I/O Subsystem.	4 Marks	L1	CO4	PO2

UNIT-V

9.	a)	Explain principles and domain of protection.	6 Marks	L4	CO5	PO2
	b)	How access controls can be used on files within a file system	6 Marks	L4	CO5	PO2
		(OR)				
10.	a)	Define program threats. List out well-known program threats.	6 Marks	L1	CO5	PO2
	b)	Define system threats. List out well-known system threats.	6 Marks	L1	CO5	PO2

CODE No.: 19BT31503 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

SYSTEM PROGRAMMING

[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Write short notes on Hard links and Symbolic links.	6 Marks	L2	CO1	PO1
	b)	Explain the standard file permissions and security mechanism in Linux.	6 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Explain the process tree in Linux and define what is Zombie Process.	6 Marks	L3	CO1	PO2
	b)	Briefly define the permissions of New Files in Linux.	6 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Write the snippet for opens the file for writing in append mode, writes the given string to the associated stream, and then closes the stream.	6 Marks	L2	CO2	PO1
	b)	Write a sample program using buffered I/O to define the structure and writes the content of the structure to standard output.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Explain ftrylockfile( ), flockfile( ) functions with syntax.	6 Marks	L3	CO2	PO2
	b)	Standard I/O implements three types of user buffering and provides developers with an interface for controlling the type and size of the buffer. Explain these three buffering techniques.	6 Marks	L2	CO2	PO1

UNIT-III

5.	a)	Explain how the Scatter/gather I/O advantages over linear I/O methods.	6 Marks	L2	CO3	PO1
	b)	Write snippets for creating a New Epoll Instance and Controlling Epoll.	6 Marks	L2	CO3	PO2
		(OR)				
6.	a)	Explain the functions readv( ) and writev( ) with examples.	6 Marks	L2	CO3	PO1
	b)	Write a simple example program that uses mmap( ) to print a file chosen by the user to standard output.	6 Marks	L2	CO3	PO3

UNIT-IV

7.	a)	Justify the role of a device driver is providing mechanism, not policy.	6 Marks	L2	CO4	PO2
	b)	Explain the kernel's role in designing unix system.	6 Marks	L2	CO4	PO2
		(OR)				
8.	a)	Briefly describe the split view of kernel with neat diagram.	6 Marks	L2	CO4	PO1
	b)	Write the differences between a kernel module and an application.	6 Marks	L2	CO4	PO2

UNIT-V

9.	a)	What are the steps for Design of scull?	6 Marks	L2	CO5	PO1
	b)	Explain the two most important data structure used in device drivers.	6 Marks	L2	CO5	PO2
		(OR)				
10.	a)	Explain debugging by watching by using simple code snippets.	6 Marks	L2	CO5	PO2
	b)	Explain the kdb Kernel Debugger tool with example.	6 Marks	L2	CO5	PO2

CODE No.: 19BT3BS01 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations January – 2022

NUMERICAL METHODS, PROBABILITY AND STATISTICS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Using method of false position, find an approximate root for the equation $x \log_{10} x = 1.2$. 6 Marks L3 CO1 PO1

   b) Find a root correct to three decimal places for $x^4 - x = 10$ using Newton- Raphson method by predicting an approximation root. 6 Marks L3 CO1 PO2

(OR)

2. a) Choose the appropriate interpolation formula and estimate the value of $e^{1.75}$ from the following data. 6 Marks L3 CO1 PO2

x	1.7	1.8	1.9	2.0
$y = e^x$	5.474	6.050	6.686	7.389

   b) Find the parabola passing through the points (0, 1), (1, 3) and (3, 55) using Lagrange's interpolation formula. 6 Marks L1 CO1 PO1

UNIT-II

3. a) Find first and second derivatives of the function tabulated below at the point x = 1.6. 6 Marks L 1 CO1 PO2

x	1.0	1.1	1.2	1.3	1.4	1.5	1.6
y	7.989	8.403	8.781	9.129	9.451	9.750	10.031

   b) Using Simpson's $\frac{1}{3}$ rule to find $\int_{0.6}^{2} e^{-x^2}\,dx$ by taking seven ordinates. 6 Marks L 3 CO1 PO1

(OR)

4. a) Calculate the values of y at x = 0.1 and x = 0.2 given that $y' = xy^2 - 1$, $y(0) = 1$ by using Taylor's series method. 6 Marks L 3 CO1 PO1

   b) Apply the fourth order Runge-Kutta method to find y(0.2), given that $y' = x + y^2$, $y(0) = 1$ *taking* $h = 0.1$. 6 Marks L 3 CO1 PO1

UNIT-III

5. a) A random variable X has the following probability function. 6 Marks L1 CO2 PO1

$X = x$	0	1	2	3	4	5	6	7
P($X = x$)	**0**	K	$2k$	$2k$	$3k$	k^2	$2k^2$	$7k^2+k$

   Find:

   i) k. ii) P(X < 6). iii) P(0 < X < 5).

   b) A continuous random variable X has the probability density function $f(x) = kx^2e^{-x}$ *when* $x \geq 0$, find the value of K and obtain the mean and variance of X. 6 Marks L1 CO2 PO1

(OR)

6.	a)	A player tosses 3 fair coins. He wins Rs.500 if 3 heads appear, Rs. 300 if 2 heads appear, Rs. 100 if 1 head occurs. On the other hand, he loses Rs. 1500 if 3 tails occur. Find the expected gain of the player.	6 Marks	L1	CO2	PO2
	b)	Show that: i) $V(X + k) = V(X)$. ii) $V(kX) = k^2V(X)$. where X is a continuous random variable and k is a constant.	6 Marks	L1	CO2	PO1

UNIT-IV

7.	a)	20% of items produced from a factory are defective. Applying statistical technique, find the probability that in a sample of 5 chosen at random i) None is defective. ii) One is defective. iii) P(1< X <4).	6 Marks	L1	CO2	PO2
	b)	Fit a Poisson distribution for the following data and find the expected frequencies.	6 Marks	L1	CO2	PO1

x	0	1	2	3	4	5
$f(x)$	42	33	14	6	4	1

(OR)

8.	a)	In a Normal distribution, 31% of the items are under 45 and 8% are over 64. Find the mean and standard deviation of the distribution.	6 Marks	L1	CO2	PO2
	b)	A random variable X has a uniform distribution over (-3, 3), find k *for which* $P(X > k) = \frac{1}{3}$. Also compute $P(X < 2)$ and $P[\lvert X - 2\rvert < 2]$.	6 Marks	L1	CO2	PO1

UNIT-V

9.	a)	In two large populations, there are 30% and 25% respectively of fair haired people. Test whether this difference likely to hidden in samples of 1200 and 900 respectively from the two populations.	6 Marks	L4	CO2	PO4
	b)	A sample of 900 members has a mean of 3.4 *cms* and standard deviation of 2.61*cms*. Test whether the sample has come from a population with mean 3.25 *cms* and standard deviation of 2.61*cms*.	6 Marks	L4	CO2	PO4

(OR)

10.	a)	A mechanist is making engine parts with axle diameters of 0.7 *inch*. A random sample of 10 parts shows a mean diameter of 0.742 *inch* with a standard deviation of 0.04 *inch*. Using suitable testing of hypothesis, to test whether the work is meeting the specification.	6 Marks	L3	CO2	PO4
	b)	1000 students at college level were graded according to their IQ and the economic conditions at their home. Using Chi-Square test, find whether there is any association between condition at home and IQ ($\alpha = 0.05$).	6 Marks	L3	CO2	PO4

Economic Condition	IQ	
	High	Low
Rich	460	140
Poor	240	160

CODE No.: 19BT3BS02 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations January – 2022

SPECIAL FUNCTIONS AND COMPLEX ANALYSIS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define Beta and Gamma functions and evaluate $\int_0^1 \frac{x^2}{\sqrt{1-x^4}}dx$ x $\int_0^1 \frac{1}{\sqrt{1-x^4}}dx$.	6 Marks	L2	CO1	PO1
	b)	Show that $\Gamma(n)\Gamma(1-n)=\frac{\pi}{\sin n\pi}$ and hence deduce the values of $\Gamma\left(\frac{1}{2}\right)$ *and* $\Gamma\left(\frac{1}{4}\right)\Gamma\left(\frac{3}{4}\right)$.	6 Marks	L2	CO1	PO1

(OR)

2.		Evaluate the integrals i) $\int_0^1 x^7(1-x)^5\,dx$. ii) $\int_0^{\pi/2} \sin^{7/2}\theta\ \cos^{3/2}\theta\ d\theta$. by using beta and gamma functions.	12 Marks	L3	CO1	PO1

UNIT-II

3.	a)	Establish the relation $\frac{d}{dx}\left[x^n J_n(x)\right] = x^n J_{n-1}(x)$.	6 Marks	L2	CO1	PO2
	b)	Define Legendre polynomial $P_n(x)$ and hence or otherwise establish the relation $P_n(x) = \frac{1}{2^n n!}\frac{d^n}{dx^n}(x^2-1)^n$.	6 Marks	L2	CO1	PO1

(OR)

4.		Evaluate $J_{1/2}(x)$ *and* $J_{-1/2}(x)$ in terms of sin x and cos x and hence show that $\left[J_{1/2}(x)\right]^2 + \left[J_{-1/2}(x)\right]^2 = \frac{2}{\pi x}$.	12 Marks	L3	CO1	PO2

UNIT-III

5.	a)	Show that $\left[\frac{\partial^2}{\partial x^2}+\frac{\partial^2}{\partial y^2}\right]\left\|f(z)\right\|^2 = 4\left\|f'(z)\right\|^2$, if $f(z)$ is a regular function of z.	6 Marks	L2	CO2	PO1
	b)	On applying the transformation $w = 1/z$ show that the image of the hyperbola $x^2 - y^2 = 1$ is the lemniscate $\rho^2 = \cos 2\phi$.	6 Marks	L3	CO2	PO2

(OR)

6.	a)	Construct an analytic function $f(z) = u + iv$ if $u - v = \frac{\cos x + \sin x - e^{-y}}{2\cos x - e^{y} - e^{-y}}$ and $f\left(\frac{\pi}{2}\right) = 0$.	6 Marks	L3	CO2	PO2
	b)	Determine the linear fractional transformation that maps $z_1 = 0, z_2 = 1, z_3 = \infty$ onto $w_1 = -1, w_2 = -i, w_3 = 1$ respectively.	6 Marks	L2	CO2	PO2

UNIT-IV

7.		Write Cauchy's theorem and verify it for the function $f(z) = z + 1$ over the boundary of the square with vertices $z = 0$, $z = 1$, $z = 1 + i$, $z = i$.	12 Marks	L2	CO2	PO2

(OR)

8.	a)	Evaluate contour integral $\int_C \frac{\log z}{(z-1)^3} dz$ *where* $c: \lvert z - 1 \rvert = 1/2$ using Cauchy's Integral formula.	6 Marks	L3	CO2	PO2
	b)	Express $f(z) = e^z$ as a Taylor's series expansion about z = 1 and z =3.	6 Marks	L2	CO2	PO1

UNIT-V

9.	a)	Evaluate the product of residues at the poles of the function $f(z) = \frac{z^2}{(z-1)(z-2)^2}$ at $z = 1, 2$.	6 Marks	L2	CO2	PO1
	b)	Define residue of f(z) at pole $z = a$ of order m. Applying the calculus of residues, show that $\int_0^{\infty} \frac{1}{1 + x^6} dx = \frac{\pi}{3}$.	6 Marks	L3	CO2	PO2

(OR)

10.		Evaluate $\int_0^{2\pi} \frac{\cos 2\theta}{1 - 2a\cos\theta + a^2} d\theta$ *where* $(a^2 < 1)$ by identifying appropriate technique of complex variables.	12 Marks	L3	CO2	PO2

CODE No.: 19BT30102 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations January – 2022

FLUID MECHANICS

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

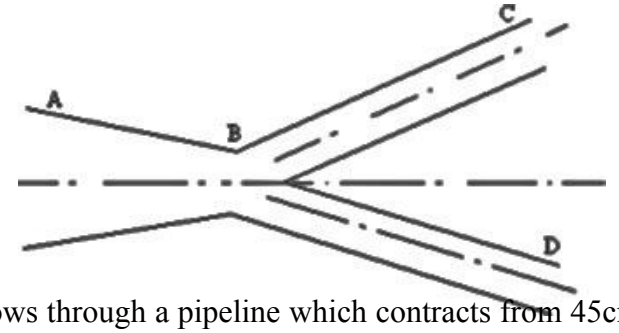
UNIT-I

1.	a)	The velocity distribution for flow over a flat plate is given by $u = 32y - y^{3/2}$, where u is the point velocity in meter per second at a distance y meter above the plate. Determine the shear stress at y = 0, 0.1 and 0.2m. Assume dynamic viscosity 5 poise.	6 Marks	L3	CO1	PO1 PO2 PO4 PO5 PO10
	b)	A liquid has a mass density of 1550 kg/m^3. Calculate its specific weight, specific gravity and specific volume.	6 Marks	L3	CO1	PO1 PO2 PO4 PO5

(OR)

2.	a)	A vertical cylinder of 20 cm diameter is rotating at 110 r.p.m in another cylinder of diameter 20.1cm concentrically. The space between the cylinders is filled with oil. If the torque required rotating the cylinder is 11.5 Nm. Find the viscosity of the oil used if the length of the cylinder is 90mm.	6 Marks	L4	CO1	PO1 PO2 PO5 PO10
	b)	An open tank contains water upto a depth of 3m and above it an oil of specific gravity 0.92 for a depth of 1m. Find the pressure intensity: i) at interface of the two liquids. ii) at the bottom of the tank.	6 Marks	L3	CO2	PO1 PO2 PO5 PO10

UNIT-II

3.	a)	In a fluid the velocity is given by $\mathbf{V= (3x+2y)i + (2z+3x^2)j + (2t - 3z)K}$. Determine: i) The velocity components u, v and w at any point in the fluid field. ii) The speed at time t = 2s at point (0, 0, 2). Also classify the velocity field as steady or unsteady flow.	6 Marks	L4	CO2	PO1 PO2 PO5 PO10
	b)	 Oil flows through a pipeline which contracts from 45cm diameter at A to 30cm diameter at B and then branches into two pipes C and D. The diameter of the pipe C is 15cm and diameter of the pipe D is 20cm. If the velocity at A is 1.8 m/sec and that at D is 3.6 m/sec Determine i) Velocity at section B. ii) Discharge at D. iii) Discharge at C. iv) Velocity at C.	6 Marks	L3	CO3	PO1 PO2 PO4 PO10

(OR)

4.	a)	A fluid flow is given by: $\left(V = xy^2 i - 2yz^2 j - \left(zy^2 \frac{2z^3}{3} \right) k \right)$. Prove that it is a case of possible steady incompressible fluid flow. Calculate the velocity and acceleration at the point (1, 2, 3).	6 Marks	L4	CO2	PO1 PO4 PO5 PO10
	b)	A 300mm diameter pipe carries water under a head of 20m with a velocity of 3.5 m/s. If the axis of the pipe turns through 45^0, find the magnitude and direction of the resultant force at the bend.	6 Marks	L4	CO3	PO1 PO2 PO5 PO10

UNIT-III

5.	a)	Water flows through a triangular right-angled weir first and over a rectangular weir of 1m width. The co-efficient of discharge of triangular and rectangular weirs are 0.6 and 0.7 receptively. If the depth of water over the triangular weir is 360 mm, find the depth of water over the rectangular weir.	6 Marks	L4	CO4	PO1 PO2 PO4 PO10
	b)	A submarine is fitted with a pitot-tube, moves horizontally in sea. The axis of the submarine is 15m below the surface of water. The pitot-tube is fixed in front of the submarine along its axis. The pitot-tube is connected with U-tube differential manometer containing mercury, the reading of which is found to be 170mm. Find the speed of submarine. Take C_v = 0.98 and specific gravity of sea water as 1.026.	6 Marks	L4	CO4	PO1 PO2 PO4 PO5 PO10

(OR)

6.	a)	Three pipes of same lengths 400m, 200m, 300m and of diameter 400mm, 200mm and 300mm respectively are connected series. The ends of the compound pipe are connected two tanks, whose water surface levels are maintained at a difference of 16m. Determine the rate of flow of water through the pipe f is 0. 005.	6 Marks	L3	CO4	PO1 PO2 PO4 PO5 PO10
	b)	Compare the discharge of 200mm and 300mm dia pipes of head loss due to friction in each pipe is the same. The pipes are of same length. Co-efficient of friction for both the pipes are equal.	6 Marks	L3	CO4	PO1 PO2 PO4 PO5 PO10

UNIT-IV

7.	a)	Derive an expression for flow of Viscous fluid through circular pipe.	6 Marks	L3	CO5	PO1 PO2
	b)	An oil of viscosity 0.1Ns/m² and relative density 0.9 is flowing through a circular pipe of diameter 50mm and length 300m. The rate of flow of fluid through the pipe is 3.5 litres/sec. Find the pressure drop in a length of 300m and also the shear stress at the pipe wall.	6 Marks	L4	CO5	PO1 PO2 PO4 PO5 PO10

(OR)

8.	a)	Describe in detail flow of viscous fluid between two parallel plates.	6 Marks	L2	CO5	PO1 PO2
	b)	Water flows between two large parallel plates at a distance of 1.6mm apart. Determine the maximum velocity, pressure drop per unit length and shear stress at the walls of the plates if the average velocity is 0.2m/sec. The viscosity of water is 0.01 poise.	6 Marks	L4	CO5	PO1 PO2 PO4 PO5 PO10

UNIT-V

9.	a)	In a 1 in 40 model of spillway velocity and discharge are 2 m/s and 2.5 m^3/s. Compute the corresponding velocity and discharge in prototype.	6 Marks	L3	CO6	PO1 PO2 PO5 PO10
	b)	A laboratory model of a river is built to geometric scale of 1:100. The fluid used in the model is oil of mass density 900 kg/m^3. The highest flood in the river is 10000m^3/s. Find out the corresponding discharge in the model.	6 Marks	L2	CO6	PO1 PO2 PO4 PO10
		(OR)				
10.		Using dimensional analysis, derive an expression for thrust P developed by a propeller assuming that it depends on angular velocity **ω**, speed of advance V, diameter D, dynamic viscosity **μ**, mass density **ρ**, elasticity of the fluid medium which can be denoted by speed of sound in the medium C.	12 Marks	L4	CO6	PO1 PO2 PO4 PO5 PO10

CODE No.: 19BT30103 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

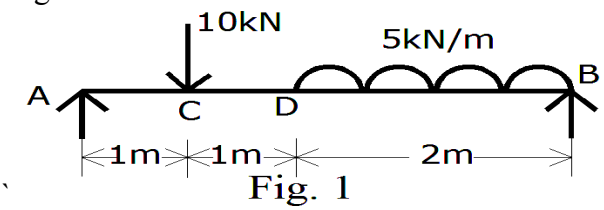
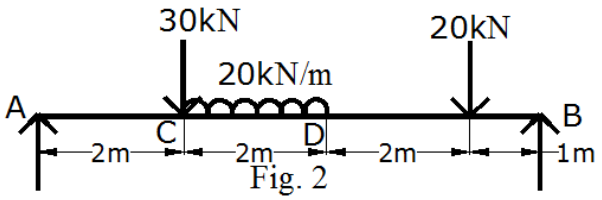
II B.Tech I Semester (SVEC-19) Supplementary Examinations January – 2022

MECHANICS OF SOLIDS
[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Draw shear force and bending moment diagram for the beam shown in Fig.1 .  Fig. 1	12 Marks	L4	CO1	PO1 PO2 PO4 PO10
		(OR)				
2.		Draw the shear force and bending moment diagram for the beam shown in Fig. 2.  Fig. 2	12 Marks	L4	CO1	PO1 PO2 PO4 PO10

UNIT-II

3.	a)	Define neutral axis. Show that neutral axis passes through centroid of the section.	6 Marks	L6	CO2	PO1 PO2 PO3 PO4 PO6 PO10
	b)	Derive the shear stress distribution across a rectangular section. Show the maximum value.	6 Marks	L6	CO2	PO1 PO2 PO3 PO4 PO6 PO10
		(OR)				
4.		The tension flange of 'I' section is 240mm x 40mm, Where as the compression flange is 120mm x 20 mm. The web is 300mm deep and 20mm thick. If the girder is used as simply supported beam of 8m span. Determine the load per m run if the allowable stress is 90N/mm^2 in compressions and 30N/mm^2 in tension. Also sketch the stress distribution shows the corresponding values.	12 Marks	L6	CO2	PO1 PO2 PO3 PO4 PO6 PO10

UNIT-III

5.		A closely-coiled helical spring has 20 turns of wire diameter 25mm. The mean radius of coils is 100mm. Find the maximum shear stress and elongation of the spring under an axial load of 2kN. G = 85GPa.	12 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO6
		(OR)				
6.		A solid shaft is required to transmit 120kW power at 200 r.p.m. Find the suitable diameter of the shaft if the maximum torque transmitted in each revolution exceeds the mean by 20%. Take allowable shear stress as 70N/mm^2 for the material of the shaft.	12 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO6

UNIT-IV

7.		At a point within a body subjected to two mutually perpendicular directions the stresses are 120N/mm^2 tensile and 80N/mm^2 compressive. Each of the above stresses is accompanied by a shear stress of 60N/mm^2. Determine the normal, shear and resultant stresses on an oblique plane inclined at an angle of 45^0 with the axis of minor tensile stress.	12 Marks	L4	CO5	PO1 PO2 PO6 PO10
		(OR)				
8.	a)	Explain maximum principal stress theory.	6 Marks	L4	CO5	PO1 PO2 PO6 PO10
	b)	At a point in a stressed material the principle stresses are 90N/mm^2 (tensile), 60N/mm^2 (tensile) and 30N/mm^2 (compressive). Find the factor of safety according to maximum shear stress theory. If the yield stress is 230N/mm^2.	6 Marks	L4	CO5	PO1 PO2 PO6 PO10

UNIT-V

9.	a)	Define slenderness ratio. State the limitations of Euler's formula.	6 Marks	L4	CO6	PO1 PO2 PO4 PO6
	b)	Differentiate between short and long column. Derive the Euler's formula when one end of the column is fixed and the other end is hinged.	6 Marks	L4	CO6	PO1 PO2 PO4 PO6
		(OR)				
10.		Determine the crippling load for a I-section girder 45cm x 25cm x 3cm and a length of 6m, which is used as a strut with both ends fixed. Take Young's modulus of the material of the girder as 2.1 x 10^5 N/mm^2.	12 Marks	L4	CO6	PO1 PO2 PO4 PO6

CODE No.: 19BT30104 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations January – 2022

SURVEYING

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What are the objectives and principles of plane surveying?	5 Marks	L2	CO1	PO1
	b)	A survey line ABC cuts the banks of a river at B and C, and to determine the distance BC, a line BE, 60 m long was set out roughly parallel to the river. A point D was then found in CE produced and middle point F of DB determined. EF was then produced to G, making FG equal to EF, and DG produced to cut the survey line H. GH and HB were found to be 40 and 80 meters long respectively. Find the distance from B to C.	7 Marks	L3	CO1	PO2
		(OR)				
2.	a)	What is local attraction? How is it detected and eliminated?	5 Marks	L2	CO1	PO1
	b)	The following fore bearings and back bearings were observed in traversing with a compass	7 Marks	L3	CO1	PO2

Line	FB	BB
PQ	S 37°30′ E	N 37°30′ W
QR	S 43°15′ W	N 44°15′ E
RS	N 73°00′ W	S 72°15′ E
ST	N 12°45′ E	S 13°15′ W
TP	N 60°00′ E	S 59°00′ W

Calculate the interior angles and correct them for observational errors.

UNIT-II

3.	a)	What is orientation? Explain the different methods of orientation of a plane table?	6 Marks	L2	CO1	PO1
	b)	Explain the permanent adjustments of leveling?	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Eight readings were taken with a level in a sequence as follows 1.585, 1.315, 2.305, 1.225, 1.325, 1.065, 1.815 and 2.325. The follow level was shifted after the third and sixth readings. The second change point was a bench mark of elevation 186.975. Find the reduced levels of the remaining stations. Use the rise and fall method.	7 Marks	L3	CO2	PO2
	b)	Define contour and contour interval. Discuss various characteristics of contours.	5 Marks	L2	CO2	PO1

UNIT-III

5.	a)	How do you measure horizontal angles by repetition method?	6 Marks	L2	CO3	PO1
	b)	For the following traverse , compute the length CD, so that A,D and E may be in one straight line	6 Marks	L3	CO3	PO2

Line	Length in meters	Bearing
AB	110	83°12’
BC	165	30°42’
CD	?	346°6’
DE	212	16°18’

(OR)

6.	a)	A tachometer is set up at an intermediate point on a traverse course PQ and the following observations are made on a vertically held staff: **Staff station** | **Vertical angle** | **Staff intercept** | **Axial hair readings** P | + 8°36′ | 2.350 | 2.105 Q | + 6°6′ | 2.055 | 1.895 The instrument is fitted with an analectic lens and the constant is 100. Compute the length of PQ and reduced level of Q, that of P being 321.50 m.	7 Marks	L3	CO3	PO2
	b)	What are the different methods employed in tachometric survey? Describe the method most commonly used.	5 Marks	L2	CO3	PO1

UNIT-IV

7.	a)	A railway embankment of length 500 m width at formation level 9 m, and side slopes 2:1 is to be constructed. The round levels every 100 m along the centerline are **Distance (m) : 0 100 200 300 400 500** **Ground level (m) : 107.8 106.3 110.5 111.0 110.7 112.2** The embankment has a rising gradient of 1.2 m per 100 m and the formation level is 110.5 m at zero distance. Calculate the volume of earth work. Assuming the round to the level across the centre line.	7 Marks	L3	CO4	PO2
	b)	Write about any three methods for calculating areas.	5 Marks	L2	CO4	PO1

(OR)

8.	a)	Explain Rankine's method of setting out circular curve?	6 Marks	L2	CO5	PO2
	b)	Two tangents intersect at chainage 1,250 m. The angle of intersection is 150°. Calculate all data necessary for setting out a simple curve of radius 250 m, by deflection angle method. The peg interval may be taken as 20 m.	6 Marks	L4	CO5	PO3

UNIT-V

9.	a)	What is total station? Illustrate its uses.	6 Marks	L2	CO6	PO1 PO12
	b)	Explain the working principle of electronic distance measurement instruments?	6 Marks	L2	CO6	PO1 PO12

(OR)

10.	a)	Discuss the benefits of drone surveying.	6 Marks	L2	CO6	PO1 PO12
	b)	How do you calculate length, area and stock pile volume from drone surveying?	6 Marks	L2	CO6	PO1 PO12

CODE No.: 19BT30203 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations January – 2022

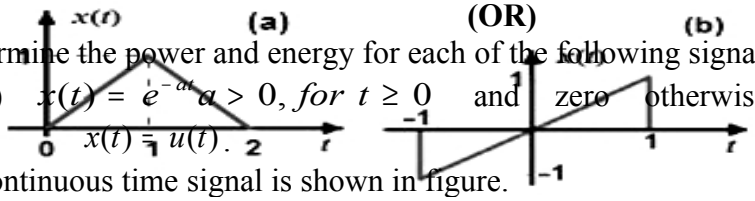
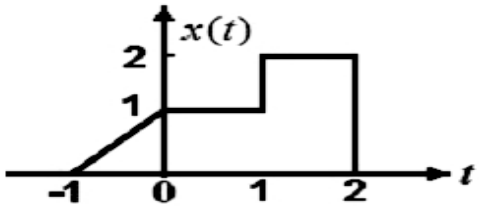
SIGNALS AND NETWORKS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Determine whether the following signal is periodic signal or aperiodic signal. In the case of periodic signal, determine the fundamental period $x(t) = 3\sin\left(3\pi t + \frac{\pi}{2}\right) + 4\sin\left(8\pi t + \frac{\pi}{2}\right)$	4 Marks	L3	CO1	PO2
	b)	Determine and sketch the even and odd parts of the given signals shown below. 	8 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Determine the power and energy for each of the following signal i) $x(t) = e^{-at}, a > 0, for\ t \geq 0$ and zero otherwise. ii) $x(t) = u(t)$.	6 Marks	L3	CO1	PO2
	b)	A Continuous time signal is shown in figure.  Sketch and label each of the following signals. i) $y_1(t) = x(t)\,u(1-t)$. ii) $y_2(t) = x(t)\{u(t) - u(t-1)\}$.	6 Marks	L3	CO1	PO2

UNIT-II

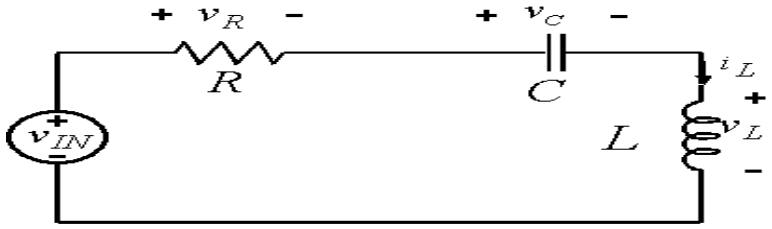
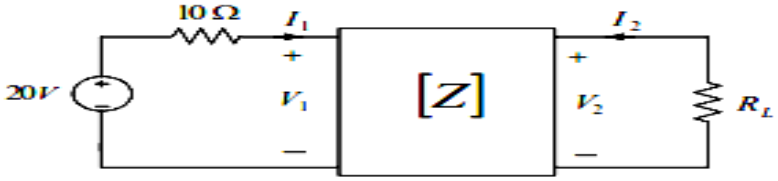
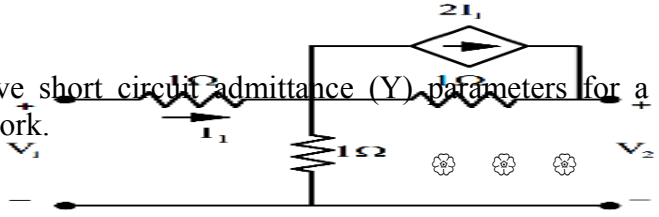
3.	a)	Explain Gibbs phenomenon for a periodic signal.	4 Marks	L1	CO2	PO1
	b)	Find the Fourier series and plot the frequency spectrum for the full wave rectified sine wave having amplitude of 'A'.	8 Marks	L3	CO2	PO2
		(OR)				
4.	a)	State any four properties of fourier transform.	4 Marks	L1	CO2	PO1
	b)	Find the Fourier Transform of the signal $x(t) = x_1(t) * x_2(t)$ where $x_1(t) = e^{-2t}u(t)$ *and* $x_2(t) = u(t)$.	8 Marks	L3	CO2	PO5

UNIT-III

5.	a)	Find the Laplace transform of the signal $x(t) = e^{-2t}\sin(2t)u(t)$.	6 Marks	L3	CO2	PO5
	b)	Find the inverse Laplace transform of $X(s) = \frac{2}{(s+4)(s-1)}$, if the ROC is $\mathrm{Re}(s) < -4$.	6 Marks	L3	CO2	PO5
		(OR)				
6.	a)	Find the z- transform of $x[n] = n\left(\frac{1}{3}\right)^n u[n]$.	6 Marks	L3	CO2	PO5
	b)	Determine the inverse ZT of the sequence $X[z] = \frac{1-2z^{-1}}{1+\frac{1}{2}z^{-1}}$, if	6 Marks	L3	CO2	PO5

x(n) is causal sequence.

UNIT-IV

7.	a)	An electrical circuit shown below has $R = 1K\Omega$, $L = 1\mu H$, $C = 1\mu F$  i) Find the system equation (ODE) which relates $v_i(t)$ with $v_o(t)$. ii) Determine transfer function H(s). iii) Draw magnitude response $\|H(j\omega)\|$.	6 Marks	L3	CO3	PO2
	b)	A 1kHz square wave is applied to the circuit shown in 7a. Discuss whether the output signal $v_o(t)$ is a square wave or a sine wave.	6 Marks	L3	CO3	PO5
		(OR)				
8.	a)	Find the Impulse response and Step response described by the differential equation is $\frac{dy(t)}{dt} + 5y(t) = x(t)$.	6 Marks	L3	CO3	PO2
	b)	A series RLC circuit has a resonance frequency of 1 KHZ and a quality factor Q=100. If each R, L and C is doubled from its original value then find the new Q-factor of the circuit.	6 Marks	L3	CO3	PO5
		UNIT-V				
9.	a)	Determine the input impedence in terms of network parameters and terminated impedance.	6 Marks	L2	CO4	PO2
	b)	The z-parameters of the two port network shown in the figure are Z11=40Ω, Z12=60Ω, Z21=80Ω and Z22=100Ω. Calculate the average power delivered to RL=20Ω. 	6 Marks	L3	CO4	PO5
		(OR)				
10	a)	In the two-port network shown below, calculate the h11 parameter whenV2=0 (where h11=V_1/I_1)	6 Marks	L3	CO4	PO2
	b)	Derive short circuit admittance (Y) parameters for a two port network. 	6 Marks	L1	CO4	PO1

CODE No.: 19BT30301 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations January - 2022

ENGINEERING THERMODYNAMICS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss the sign conventions for work and heat transfer.	4 Marks	L1	CO1	PO1
	b)	A gas expands from an initial state, where the pressure is 340 kPa and the volume is 0.0425m^3 to final pressure is 136 kPa. The relationship between the pressure and volume of the gas is PV^2 = constant. Determine the work for the process.	8 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Differentiate macroscopic and microscopic viewpoints.	4 Marks	L2	CO1	PO1
	b)	A mass of gas is compressed in a quasi-static process from 80 kPa, 0.1m^3 to 0.4 MPa, 0.03m^3. Assuming that the pressure and volume are related by pV^n=constant, find the work done by the gas system.	8 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Name the four processes that make up the Carnot cycle with flow chart.	4 Marks	L1	CO1	PO1
	b)	A gas undergoes a thermodynamic cycle consisting of the following processes: i) Process 1–2: Constant pressure p = 1.4 bar, V_1 = 0.028m^3, W_{12} = 10.5 Kj. ii) Process 2–3: Compression with pV = constant, $U_3 = U_2$. iii) Process 3–1: Constant volume, $U_1 - U_3 = -26.4$ kJ. There are no significant changes in KE and PE. i) Sketch the cycle on a PV diagram. ii) Calculate the network for the cycle in kJ. iii) Calculate the heat transfer for process 1–2. iv) Show that cycle $\sum_{\text{Cycle}} Q = \sum_{\text{Cycle}} W$	8 Marks	L3	CO1	PO2
		(OR)				
4.	a)	State and explain the Clausius statement of second law of thermodynamics.	4 Marks	L2	CO1	PO1
	b)	Two kg of water at 90ºC are mixed adiabatically with 3.5 kg of water at 20ºC in a constant pressure of 1 atmosphere. Find the increase in the entropy of the total mass of water due to the mixing process (Cp of water = 4.187 kJ/kg K).	8 Marks	L3	CO1	PO2

UNIT-III

5.	a)	Draw the phase change process for pure substance or steam formation and explain.	4 Marks	L2	CO2	PO1
	b)	Air flows steadily at the rate of 0.4 kg/s through an air compressor, entering at 6 m/s with a pressure of 1 bar and a specific volume of 0.85 m^3/kg, and leaving at 4.5 m/s with a pressure of 6.9 bar and a specific volume of 0.16 m^3/kg. The internal energy of the air leaving is 88 kJ/kg, which is greater than that of the air entering. Cooling water in a jacket surrounding the cylinder absorbs heat from the air at the rate of 59 W. Calculate the power required to drive the compressor and the inlet and outlet	8 Marks	L3	CO2	PO2

cross-sectional areas.

(OR)

6.	a)	Write Helmholtz function and Gibbs function.	4 Marks	L1	CO2	PO1
	b)	An adiabatic vessel contains 3 kg of water at 27ºC. By Paddle-wheel work transfer, the temperature of water is increased to 32ºC. Find the entropy change of the universe, If Cp of water = 4.187 kJ/kg K.	8 Marks	L3	CO2	PO2

UNIT-IV

7.	a)	Explain the combustion analysis of hydrogen.	4 Marks	L2	CO3	PO1
	b)	Percentage volumetric analysis of a sample of flue gases of a coal-fired boiler gave CO_2=10.4, CO=0.2, O_2=7.8, N_2=81.6 (by difference). Gravimetric percentage analysis of coal was C=78, H_2=6, O_2=3 and incombustibles=13. Estimate: i) Weight of flue gases per kg of fuel. ii) Weight of excess air per kg of fuel.	8 Marks	L3	CO3	PO2

(OR)

8.	a)	The volume analysis of fuel gas is CO_2 = 14%, O_2 = 8%, and N_2=78%. Convert this volume analysis to mass analysis.	4 Marks	L3	CO3	PO2
	b)	In a boiler, the coal having 88% C, 3.8% H_2, 2.2% O_2 and remaining ash is burnt in the furnace. It is found that CO_2 going with flue gases constitute to be 12% and temperature of flue gases is 260°C. The flue gas sample is analyzed using Orsat apparatus at room temperature. Determine the percentage of CO_2 that would be there for complete combustion of fuel.	8 Marks	L3	CO3	PO2

UNIT-V

9.	a)	Explain the working of Spark Ignition (SI) engine.	4 Marks	L2	CO4	PO1
	b)	In an air-standard Otto cycle, the compression ratio is 10. The condition at the beginning of the compression process is 100 kPa and 27ºC. Heat added at constant volume is 1500 kJ/kg, while 700 kJ/kg of heat is rejected during the other constant volume process in the cycle. Specific gas constant for air = 0.287 kJ/kg K. Determine mean effective pressure of the cycle.	8 Marks	L3	CO4	PO2

(OR)

10.	a)	Show that efficiency of the Otto cycle depends only on compression ratio.	4 Marks	L2	CO4	PO1
	b)	In an air standard Diesel cycle, the compression ratio is 15, and at the beginning of isentropic compression, the temperature is 15ºC and the pressure is 0.15 MPa. Heat is added until the temperature at the end of the constant pressure process is 1400ºC. Calculate: i) the cut-off ratio. ii) the cycle efficiency.	8 Marks	L3	CO4	PO2

CODE No.: 19BT30302 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations January – 2022

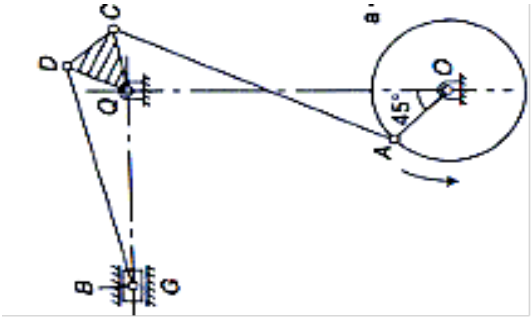
KINEMATICS OF MACHINERY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

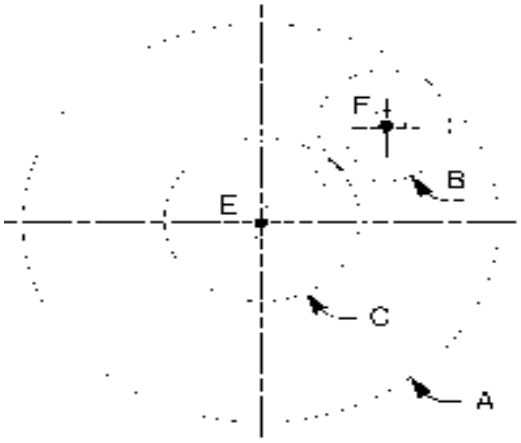
UNIT-I

1.	a)	Explain how the velocities of a slider and the connecting rod are obtained in a slider crank mechanism.	6 Marks	L2	CO1	PO1
	b)	Distinguish between: i) Mechanism and Machine. ii) Kinematics and Dynamics. iii) Analysis and Synthesis of mechanisms.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Explain the terms: i) Lower pair. ii) Higher pair. iii) Kinematic chain. iv) Inversion.	4 Marks	L2	CO1	PO1
	b)	The lengths of various links of a mechanisms shown in fig are as follows: OA=150mm, CD=125mm, AC=600mm, BD=500mm, CQ=QD=145mm, OQ=625mm The crank OA rotates at 60 rpm in the counter clockwise direction. Determine the velocity of the slider B and the angular velocity of the link BD when the crank has turned an angle of 45^0 with the vertical. 	8 Marks	L3	CO1	PO1

UNIT-II

3.	a)	Show that in Watt's straight line motion mechanism, the tracing point P on the coupler divides it in the ratio of the length of the oscillating links which are connected by it.	6 Marks	L3	CO3	PO1 PO2
	b)	Explain, through a Polar velocity diagram of Hook's Joint, the variation in the speed of the driven shaft with change in the speed of driving shaft and mark the salient features on the diagram.	6 Marks	L2	CO3	PO1, PO2
		(OR)				
4.	a)	List the advantages and disadvantages of Davis steering gear.	3 Marks	L1	CO4	PO1 PO2
	b)	What condition is to be satisfied by the Davis steering gear-whenever the vehicle is taking a turn - for any radius of curvature of the path of the vehicle? Derive the expression of this condition.	4 Marks	L2	CO4	PO1 PO2
	c)	Draw a neat sketch of the Peaucellier straight line motion mechanism, and prove that it produces an exact straight line motion.	5 Marks	L4	CO4	PO1 PO2

UNIT-III

5.	a)	What is the difference between a simple gear train and a compound gear train? Explain with the help of sketches.	4 Marks	L3	CO5	PO1 PO2 PO3
	b)	An epicyclic gear consists of three gears A, B and C as shown in Fig. The gear A has 72 internal teeth and gear C has 32 external teeth. The gear B meshes with both A and C and is carried on an arm EF which rotates about the centre of A at 18 r.p.m. If the gear A is fixed, determine the speed of gears B and C. 	8 Marks	L4	CO5	PO1 PO2 PO3

(OR)

6.		A pinion of 20 involute teeth and 125 mm pitch circle diameter drives a rack. The addendum of both pinion and rack is 6.25 mm. What is the least pressure angle which can be used to avoid interference? With this pressure angle, find the length of the arc of contact and the minimum number of teeth in contact at a time.	12 Marks	L4	CO5	PO1 PO2 PO3

UNIT-IV

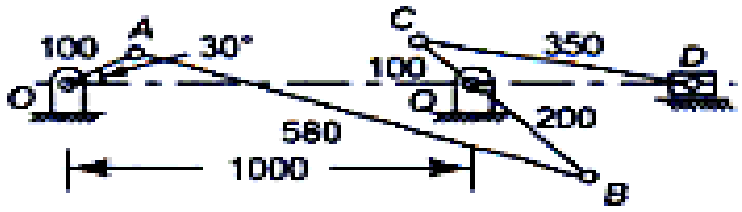
7.	a)	Deduce expressions for the velocity and acceleration of the follower when it moves with simple harmonic motion	5 Marks	L3	CO6	PO1 PO2 PO3
	b)	A cam operating an oscillating roller follower with minimum radius of cam=44mm, Diameter of roller=14mm, Length of the follower arm=40mm, Distance of fulcrum centre from cam centre=50mm, Angle of ascent=750, Angle of descent =1050, Angle of dwell for follower in the highest position=600, Angle of oscillation of follower=280. Draw the profile of the cam if the ascent and descent both take place with SHM.	7 Marks	L4	CO6	PO1 PO2 PO3

(OR)

8.	a)	Explain with sketches the different types of cams and followers.	4 Marks	L2	CO6	PO1 PO2 PO3
	b)	A cam is to give the following motion to a knife-edged follower : 1. Outstroke during 60° of cam rotation ; 2. Dwell for the next 30° of cam rotation ; 3. Return stroke during next 60° of cam rotation, and 4. Dwell for the remaining 210° of cam rotation. The stroke of the follower is 40 mm and the minimum radius of the cam is 50 mm. The follower moves with uniform velocity during both the outstroke and return strokes. Draw the profile of the cam when i) the axis of the follower passes through the axis of the cam shaft, and ii) the axis of the follower is offset by 20 mm from the axis of the cam shaft.	8 Marks	L3	CO6	PO1 PO2 PO3

UNIT-V

9.	Locate all the instantaneous centers of the mechanism as shown in figure. The dimensions of the links are OA=100mm, AB=580mm, BC=300mm, QC=100mm and CD=350mm. The crank OA rotates clockwise at 150 r.p.m. For the position when the crank OA makes an angle of 300 with the horizontal. Determine the i) Linear velocities of the pivot points B, C and D ii) Angular velocities of the links AB, BC and CD.	12 Marks	L3	CO2	PO1 PO2 PO3



(OR)

10.	PQRS is a four bar chain with link PS fixed. The lengths of the links are PQ = 62.5 mm ; QR = 175 mm ; RS = 112.5 mm ; and PS = 200 mm. The crank PQ rotates at 10 rad/s clockwise. Draw the velocity and acceleration diagram when angle QPS = 60° and Q and R lie on the same side of PS. Find the angular velocity and angular acceleration of links QR and RS.	12 Marks	L4	CO2	PO1 PO2 PO3

❀ ❀ ❀

CODE No.: 19BT30304 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations January – 2022

STRENGTH OF MATERIALS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

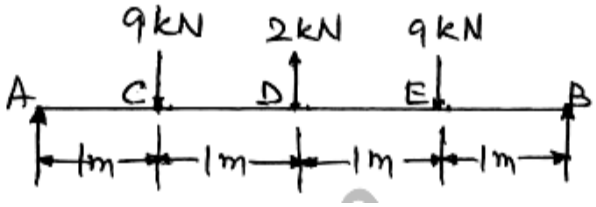
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Determine the Poisson's ratio and bulk modulus of a material, for which Young's modulus is 1.2×10^5 N/mm² and modulus of rigidity is 4.8×10^4 N/mm².	4 Marks	L1	CO1	PO1
	b)	An axial pulls of 40 kN is acting on a bar consisting of three sections of length 30 cm, 25 cm and 20 cm and diameters 2 cm, 4 cm, 5 cm respectively, if E = 2×10^5 N/mm² determine i) Stress in each section. ii) Total extension of the bar.	8 Marks	L3	CO1	PO3
		(OR)				
2.	a)	A steel bar is 4m long and it's both ends are firmly fixed to two walls. The original temperature of the bar is 40°C. If the bar is cooled to 25°C, determine the thermal stress and strain in the bar. Assume Young's modulus of steel 200kN/mm² and co-efficient of linear expansion 12×10^{-6} per °C.	6 Marks	L1	CO1	PO1
	b)	A hollow steel cylinder of 300mm length, 150mm inside diameter and 3mm uniform wall thickness is filled with concrete and compressed between two rigid parallel plates at the ends by a load 600 kN. Find the compressive stress in each material and the total shortening of the cylinder if the Young's modulus of steel = 2×10^5 N/mm² and Young's modulus of concrete = 2×10^4 N/mm².	6 Marks	L3	CO1	PO3

UNIT-II

3.	a)	Explain the concept of shear force and bending moment.	4 Marks	L1	CO2	PO1
	b)	Draw the shear force and bending moment diagrams for the beam shown below.	8 Marks	L2	CO2	PO3



(OR)

4.		A cantilever is subjected to a download load of 3000N at its free end and an upward vertical force of 12000 N at the middle. The cantilever is 12m long and supports a uniformly distributed load of 1000N per meter run. Draw the B.M. and S.F. diagrams.	12 Marks	L3	CO2	PO3

UNIT-III

5.	a)	Two principal stresses at a point in a bar are 200 N/mm² (tensile) and 100 N/mm² (compressive). Determine the resultant stress in the magnitude and direction on a plane inclined at 60° to the axis of the major principal stress. Also determine the maximum intensity of the shear stress.	6 Marks	L1	CO3	PO1
	b)	What assumptions are made in the theory of the simple bending?	6 Marks	L2	CO3	PO3

(OR)

6.	a)	A straight cylindrical bar is 16mm diameter and 1.2m long. When freely supported at its two ends horizontally under a concentrated load of 90N at centre develops some bending stress for a central deflection of 5mm. Find this bending stress developed. What load is required to buckle it when loaded vertically?	5 Marks	L1	CO3	PO1
	b)	Two wooden planks 150mm x 50mm each are connected to form a T-section of a beam. If a moment of 3.4kN-m is applied around the horizontal neutral axis, inducing tension below the neutral axis, find the stresses in extreme fibres of the cross-section.	7 Marks	L2	CO3	PO3

UNIT-IV

7.	a)	Derive the torsion equation, explain its assumptions and compare strengths of solid and hollow shafts.	6 Marks	L2	CO4	PO2
	b)	Determine the diameters of a hollow shaft transmitting 300 kW at 250 r.p.m. The maximum shear stress in the shaft should not exceed 30MPa. Assume the ratio of inner to outer diameter (di/do) = 0.75 and modulus of rigidity (C) = 100 GPa.	6 Marks	L3	CO4	PO3

(OR)

8.	a)	Explain in brief about principal planes and principal stresses.	5 Marks	L2	CO4	PO2
	b)	Find the principal stresses, maximum shear stress and all the angles of an element y = 180MPa and T_{xy} = 80MPa (CCW) both analytically σ_x = –120MPa, σsubjected to and graphically.	7 Marks	L3	CO4	PO3

UNIT-V

9.	a)	Find the deflection of a simply supported beam with a central point load by Moment Area Method.	6 Marks	L1	CO5	PO2
	b)	A Cantilever of length '2a' is carrying 'W' load at free end and 'W' load at the centre. Using Moment Area method, determine the slope and deflection at the free end.	6 Marks	L2	CO5	PO3

(OR)

10.		What is Macaulay's method? Derive an expression for deflection at any section of a simply supported beam with eccentric point load, using Macaulay's method.	12 Marks	L3	CO5	PO2

CODE No.: 19BT30402 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations January – 2022

ELECTRONIC DEVICES AND CIRCUITS

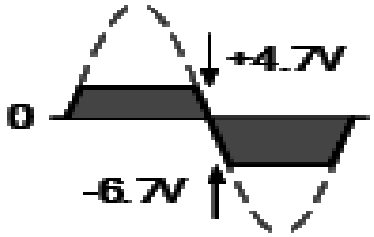
[Electrical and Electronics Engineering, Electronics and Communication Engineering, Computer Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Design a clipper circuit to generate the wave form shown below.	6 Marks	L1	CO1	PO1

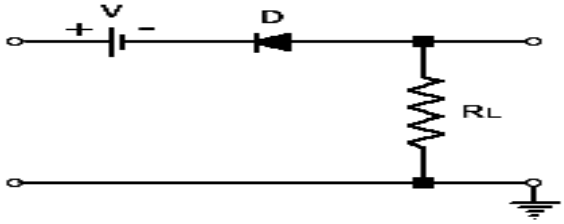


Assume $V_{in\ p\text{-}p}$ =30V and the diode is non-ideal and V_{th}=0.7V.

	b)	Realize a low pass filter having cut-off frequency of 1KHz. Derive an expression for the output at steady state condition when the circuit excited by a unit step.	6 Marks	L2	CO1	PO2

(OR)

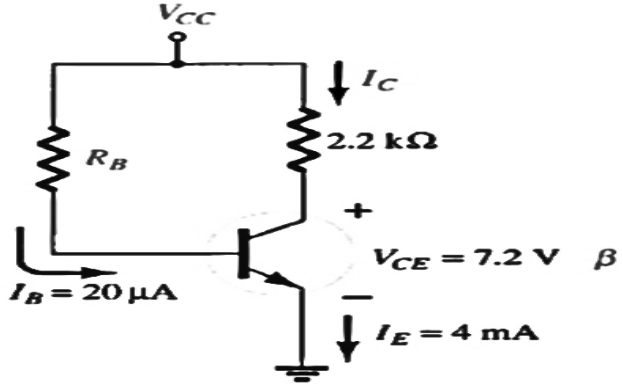
2.	a)	Sketch the out waveform of the circuit show below for a give sinusoidal input of 10V peak, V=3V and assume the diode in non-ideal and having a threshold voltage of 0.7V.	6 Marks	L1	CO1	PO1



	b)	Explain the operation of a negative clamper circuit with neat sketch. Condition: Assume the diode is non-ideal.	6 Marks	L3	CO1	PO4

UNIT-II

3.	a)	For a voltage divider biasing circuit, calculate the values of R_C, R_1, and R_2. V_{CC} = 12V. The quiescent values are I_C=2mA, and V_{CE}=6V. Assume β=100, V_{BE}=0.7V and R_E=200Ω	6 Marks	L1	CO2	PO1
	b)		6 Marks	L2	CO2	PO4



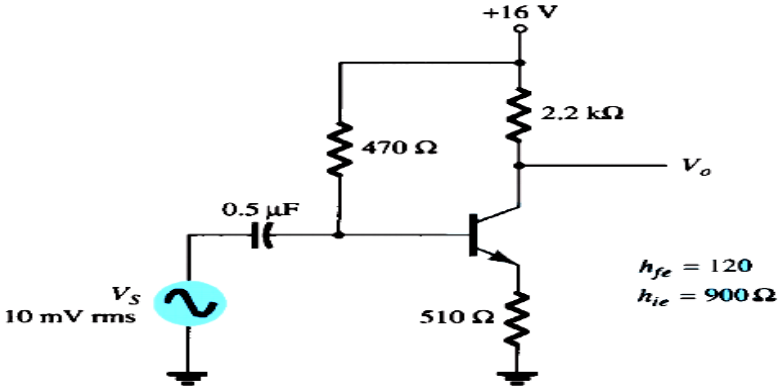
Determine I_C, V_{CC}, β and R_B

(OR)

4.	a)	For a fixed bias circuit derive the expressions for S, S' and S''	6 Marks	L3	CO2	PO3
	b)	Explain the concept of negative feedback in collector to base bias with emitter resistor.	6 Marks	L2	CO2	PO2

UNIT-III

5.		Calculate the small signal voltage gain, input and output impedances of amplifier configuration shown below.	12 Marks	L4	CO3	PO2



(OR)

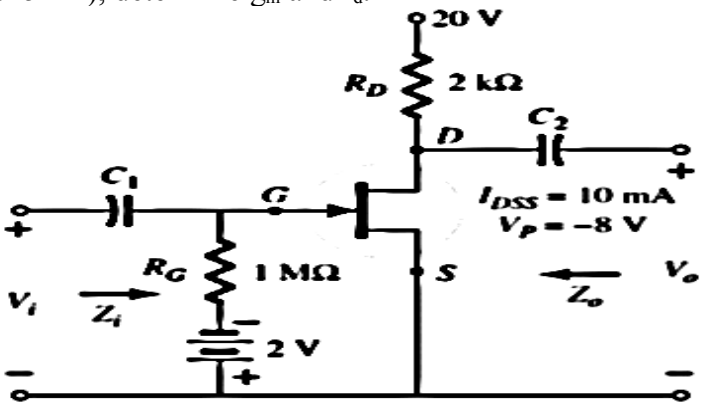
6.	a)	Draw the *h*-parameter model of a CB configuration.	6 Marks	L2	CO3	PO1
	b)	Explain the advantages of *h*-parameter model over R_e model of a transistor.	6 Marks	L3	CO3	PO1

UNIT-IV

7.	a)	Explain the enhancement mode operation of a *n*MOSFET with neat sketchs.	6 Marks	L2	CO4	PO4
	b)	Derive the drain current expression of MOSFET and also derive the expression when the MOSFET operating in saturation.	6 Marks	L2	CO4	PO2

(OR)

8.	a)	For a given I_{DSS} of 10mA and V_P = -5V draw the transfer characteristics of a JFET.	6 Marks	L2	CO4	PO1
	b)	For a fixed bias shown below having an operating point of (-3V, 6.625mA), determine g_m and r_d.	6 Marks	L2	CO4	PO2



UNIT-V

9.	a)	Explain the operation of tunnel diode using energy band diagram.	6 Marks	L3	CO5	PO1
	b)	Draw the construction of a DIAC and explain the various modes of operation.	6 Marks	L2	CO5	PO2

(OR)

10.	a)	Explain operation of a varactor diode and draw the C-V characteristics.	6 Marks	L2	CO5	PO1
	b)	Explain the working of SCR and draw the I-V characteristics.	6 Marks	L3	CO5	PO4

❀ ❀ ❀

CODE No.: 19BT30403 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations January – 2022

SIGNALS AND SYSTEMS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Given a signal $x(t) = \begin{cases} 1; & 0 < t < 2; \\ 0: & otherwise \end{cases}$ Plot the following signals x(-t), x(3t), x(t/3), 5x(-2t+3)	6 Marks	L3	CO1	PO2
	b)	Why the unit step signal u(t) is neither even nor odd? Determine the even and odd parts of u(t).	6 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Check whether the following system is Static or dynamic, Linear or Non-linear, Causal or Non-causal, Time invariant or time-variant. $y(n) = \log_{10}\lvert x(n)\rvert$.	6 Marks	L6	CO1	PO2
	b)	Prove that $x(t) * \delta(t - t_0) = x(t - t_0)$.	6 Marks	L4	CO1	PO2

UNIT-II

3.	a)	Discuss the concept of exponential Fourier series and derive the Expressions for coefficients. Also discuss the concept of line spectrum.	6 Marks	L2	CO2	PO3
	b)	Determine the Fourier Transform of: i) $f_1(t) = e^{-at}\cos(bt)$. ii) $f_2(t) = t\cos(at)$.	6 Marks	L3	CO2	PO2
		(OR)				
4.	a)	Expand the following periodic function f(t) over the interval (-4, 4) by a complex Fourier Series $f(t) = \begin{cases} 1; & -2 < t < 2; \\ 0: & otherwise \end{cases}$	6 Marks	L3	CO2	PO2
	b)	State and prove any three properties of Fourier Transform.	6 Marks	L2	CO2	PO1

UNIT-III

5.	a)	Explain the method of detection of periodic signals in the presence of noise by correlation.	6 Marks	L2	CO3	PO1
	b)	Determine the cross correlation between the two sequences x(n) = {1,0,01} and h(n) = { 4,3,2,1}	6 Marks	L3	CO3	PO2
		(OR)				
6.	a)	A filter has an input $x(t) = e^{-2t}u(t)$ and the transfer function, $H(w) = \frac{1}{1 + jw}$. Find Energy Spectral Density of the output.	6 Marks	L3	CO3	PO4
	b)	State and prove the relation between convolution and correlation.	6 Marks	L2	CO3	PO3

UNIT-IV

7.	a)	Find the inverse Laplace Transform of $X(s) = \frac{2}{(s+4)(s-1)}$, if the Region of Convergence is: i) $\mathrm{Re}(s) > 1$. ii) $\mathrm{Re}(s) < -4$.	6 Marks	L3	CO4	PO2
	b)	Define Region of convergence and state its properties.	6 Marks	L1	CO4	PO1
		(OR)				

8.	a)	Find the inverse Laplace Transform of $X(s) = \frac{1}{(s+5)(s-1)}$ if the Region of Convergence is $-5 < \mathrm{Re}(s) < -1$.	6 Marks	L3	CO4	PO2
	b)	State and prove any three properties of Laplace transform.	6 Marks	L2	CO4	PO1

UNIT-V

9.	a)	Define Nyquist rate. Compare the merits and demerits of performing sampling using impulse, Natural and Flat-top sampling techniques.	6 Marks	L4	CO4	PO4
	b)	Discuss the effect of aliasing due to under sampling.	6 Marks	L2	CO4	PO4

(OR)

10.	a)	A signal $x(t) = \sin c(150\pi t)$ is sampled at a rate of i) 100 Hz ii) 200Hz iii) 300 Hz. For each of these three cases, explain if you can recover the signal x(t) from the sampled signal.	6 Marks	L3	CO4	PO2
	b)	Discuss the process of reconstructing the signal from its samples.	6 Marks	L2	CO4	PO4

CODE No.: 19BT30404 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations January – 2022

SWITCHING THEORY AND LOGIC DESIGN

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

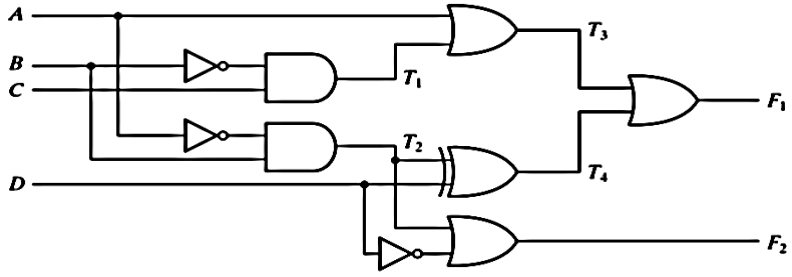
Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Perform the following in BCD. i) 679.6+536.8. ii) 206.7-147.8.	6 Marks	L3	CO1	PO2
	b)	Explain about Error detection and correction codes.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Subtract the following decimal numbers using the 12-bit 2's complement methods. i)52-17. ii) 46-84. iii) 63.75-17.5.	6 Marks	L3	CO1	PO4
	b)	List out the binary codes in Number Systems.	6 Marks	L4	CO1	PO1

UNIT-II

3.	a)	Give the Minimized Expression for $F=\Sigma_{wxyz}(1,3,4,5,9,11,12,13,14,15)$ using K-Maps and indicate the Prime Implicants.	6 Marks	L3	CO1	PO1
	b)	Derive the Boolean expressions for T_1 through T_4. Evaluate the outputs F_1 and F_2 as a function of the four inputs. **CO 1** **(2M)** 	6 Marks	L5	CO1	PO2
		(OR)				
4.	a)	Express the following function as a sum of minterms and as a product of maxterms : $F(A, B, C, D) = B'D + A'D + BD$.	6 Marks	L4	CO1	PO3
	b)	Simplify the following Boolean function F, together with the don't-care conditions d , and then express the simplified function in sum-of-minterms form: $F(A, B, C, D) = \sum(0, 6, 8, 13, 14) + d(2,4, 10)$.	6 Marks	L4	CO1	PO4

UNIT-III

5.	a)	Design and explain the Carry look ahead adder.	6 Marks	L6	CO2	PO1
	b)	Design and explain 3X8 Decoder.	6 Marks	L6	CO2	PO2
		(OR)				
6.	a)	Design a magnitude comparator with necessary equations.	6 Marks	L6	CO2	PO4

	b)	Draw the circuit of Binary Adder-Subtractor and explain its operation.	6 Marks	L4	CO2	PO4

UNIT-IV

7.	a)	Convert JK flip flop to T flip flop.	6 Marks	L3	CO2	PO3
	b)	How the JK-Flip Flops used as divide-by-2 devices? Explain with the help of the timing diagram, by taking 3 numbers of JK-Flip Flops connected to divide the input frequency.	6 Marks	L4	CO2	PO1
		(OR)				
8.	a)	Explain state machine synthesis using transition lists.	6 Marks	L2	CO3	PO3
	b)	Differentiate between Ring counter and Johnson Counter with examples.	6 Marks	L4	CO2	PO6

UNIT-V

9.	a)	Explain the difference between synchronous and asynchronous sequential circuits.	6 Marks	L2	CO3	PO1
	b)	Explain the difference between stable and unstable states.	6 Marks	L2	CO3	PO2
		(OR)				
10.	a)	Explain about different hazards in combinational circuits.	6 Marks	L1	CO4	PO4
	b)	Distinguish between ROM, PLA and PAL.	6 Marks	L4	CO4	PO4

CODE No.: 19BT30501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations January – 2022

COMPUTER GRAPHICS

[Computer Science and Engineering, Information Technology]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		Explain in detail about the following: i) Raster-Scan Displays. ii) Random-Scan Displays. iii) Color CRT Monitors.	12 Marks	L1	CO1	PO1
		(OR)				
2.	a)	List out the operations of Graphic Monitors and Workstations.	4 Marks	L1	CO1	PO1
	b)	Summarize the various steps involved in Midpoint Circle algorithm and explain it with an example.	8 Marks	L2	CO2	PO2
		UNIT-II				
3.	a)	Define Affine Transformation and write a short note on it.	4 Marks	L1	CO2	PO1
	b)	Explain in detail about Transformations between coordinate systems with suitable example.	8 Marks	L2	CO2	PO2
		(OR)				
4.	a)	Write a pseudo code for filling color in an object using Boundary fill algorithm to fill an 8 connected region.	6 Marks	L1	CO2	PO1
	b)	Explain in detail about various components of Composite Transformations.	6 Marks	L1	CO2	PO1
		UNIT-III				
5.	a)	Explain in detail about the following with suitable examples related to polygon surfaces. i) Polygon Tables. ii) Plane Equations. iii) Polygon Meshes.	6 Marks	L2	CO3	PO2
	b)	Explain in detail about BEZIER CURVES with a suitable example program that illustrates a method for generating Bezier curves.	6 Marks	L2	CO3	PO2
		(OR)				
6.	a)	Explain in detail about the following related to quadradic surfaces. i) Sphere. ii) Ellipsoid. iii) Torus	6 Marks	L2	CO3	PO2
	b)	Define spline curve and illustrate the differences between interpolation and approximation splines.	6 Marks	L2	CO3	PO2
		UNIT-IV				
7.	a)	Explain in detail about parallel projection with suitable example.	8 Marks	L2	CO3	PO2
	b)	Illustrate in brief about three-dimensional viewing functions.	4 Marks	L2	CO3	PO1
		(OR)				
8.	a)	Explain in detail about perspective projection with suitable example.	7 Marks	L2	CO3	PO2
	b)	Illustrate in brief about composite transformations with an example.	5 Marks	L2	CO3	PO2

UNIT-V

9.	a)	List out the two basic techniques for anti-aliasing in ray-tracing algorithms with suitable example for each.	5 Marks	L2	CO4	PO2
	b)	Explain in detail about Distributed Ray Tracing sampling method.	7 Marks	L2	CO4	PO2

(OR)

10.	a)	Define Phong Shading and explain in detail about Fast Phong Shading	6 Marks	L2	CO4	PO2
	b)	Explain in detail about Gouraud Shading in detail with a suitable example.	6 Marks	L2	CO4	PO2

CODE No.: 19BT30502 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations January – 2022

COMPUTER ORGANIZATION

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain about IEEE floating point representation and perform addition of two floating numbers.	6 Marks	L2	CO1	PO1
	b)	Explain the One stage of Arithmetic logic shift unit with neat sketch.	6 Marks	L2	CO3	PO3
		(OR)				
2.	a)	Formulate the hardware and draw the flowchart for Booth's Multiplication. Solve (-9) x (-13) by applying Booth's Multiplication algorithm.	9 Marks	L3	CO1	PO3
	b)	Draw the block diagram of 4-bit arithmetic circuit and explain the functionality and show in tabular form.	3 Marks	L2	CO2	PO1
		UNIT-II				
3.	a)	Explain various registers that are connected to a common bus in a basic computer with neat diagram.	6 Marks	L2	CO2	PO2
	b)	Discuss Control unit of basic computer with neat sketch.	6 Marks	L2	CO2	PO2
		(OR)				
4.	a)	Explain various CPU organizations and evaluate the expression X = (A+B) * (C+D) in: i) Three address instructions. ii) Two address instructions. iii) One address instructions. iv) Zero address instructions.	6 Marks	L2	CO2	PO1
	b)	Explain about basic instruction cycle. Explain are the different phases of instruction cycle with neat diagrams and draw the flow chart.	6 Marks	L2	CO2	PO1
		UNIT-III				
5.	a)	Explain the design of control unit with micro program sequencer with neat diagram.	6 Marks	L2	CO2	PO1
	b)	Explain Priority interrupt Daisy chaining priority with neat sketch.	6 Marks	L2	CO4	PO2
		(OR)				
6.	a)	Differentiate between hardwired control and micro programmed control.	6 Marks	L4	CO2	PO2
	b)	Explain PCI physical and logical architecture.	6 Marks	L2	CO2	PO1
		UNIT-IV				
7.	a)	Explain different Read only memories.	6 Marks	L2	CO3	PO3
	b)	What for cache memory is used? Explain three types of mapping procedures of cache memory organization.	6 Marks	L2	CO2	PO1
		(OR)				

8.	a)	Compare and contrast Synchronous and Asynchronous DRAMS.	6 Marks	L4	CO4	PO2
	b)	Briefly explain Non volatile Solid state memory Technologies	6 Marks	L2	CO2	PO1

UNIT-V

9.	a)	Discuss about Flynn's classification of parallel processor systems.	6 Marks	L2	CO2	PO2
	b)	Explain Inter-processor arbitration	6 Marks	L2	CO2	PO1

(OR)

10.	a)	Describe Hardware performance issues of multi core computers.	6 Marks	L2	CO2	PO1
	b)	Discuss features of Intel core i7-990X.	6 Marks	L2	CO4	PO2

CODE No.: 19BT30503 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations January - 2022

DATA STRUCTURES

[Computer Science and Engineering, Information Technology]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Describe in detail about Polynomial manipulation in linked list.	6 Marks	L1	CO1	PO1
	b)	What is a linked list? Describe the suitable routine segments for any four operations.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Given a list 100, 200, 300, 400, generalize the steps and write routine to delete a node from the beginning of the linked list, deletion of last node in a list and deletion of middle node in a list.	6 Marks	L5	CO4	PO3
	b)	Examine a doubly linked list with neat diagram.	6 Marks	L3	CO1	PO2
		UNIT-II				
3.	a)	Develop an algorithm for deleting an element in a double ended queue.	6 Marks	L6	CO1	PO3
	b)	Write algorithm to check if the parenthesized arithmetic expression contains balanced parenthesis and to convert such expression to postfix form and evaluate it. Illustrate with example.	6 Marks	L2	CO1	PO2
		(OR)				
4.	a)	Give an algorithm to convert an infix expression to a postfix expression using stack with suitable example.	6 Marks	L2	CO1	PO1
	b)	Illustrate the application of stack with an example.	6 Marks	L3	CO1	PO1
		UNIT-III				
5.	a)	Illustrate the steps in the construction of a heap of records with the following key values:12, 33, 67, 8, 7, 80, 5, 23.	6 Marks	L3	CO4	PO1
	b)	Write an algorithm for preorder, inorder and postorder traversal of a binary tree.	6 Marks	L1	CO2	PO1
		(OR)				
6.	a)	Create a binary search tree using the following data elements 45, 39, 56, 12, 34, 78, 32, 10, 89, 54, 67, 81.	6 Marks	L5	CO4	PO3
	b)	Construct B Tree of order m=5 for the following keys. 1, 12, 8, 2, 25, 5, 14, 28, 17, 7, 52, 16, 48, 68, 3, 26, 29, 53, 55, 45.	6 Marks	L6	CO4	PO3
		UNIT-IV				
7.	a)	Compare working of binary search and linear search technique with example.	6 Marks	L2	CO3	PO2
	b)	Using binary search, search the number 26 from the list of numbers and give the steps. 10, 7, 17, 26, 32, 92.	6 Marks	L6	CO4	PO3
		(OR)				
8.	a)	Select the best sorting method out of the following - insertion sort, quick sort and merge sort and give justification.	6 Marks	L5	CO3	PO2
	b)	Sort the given integers and Show the intermediate results using shellsort: 39, 9, 81, 45, 90, 27, 72, 18.	6 Marks	L3	CO4	PO3

UNIT-V

9.	a)	List the different types of hashing techniques. Explain them in detail with an example.	6 Marks	L1	CO3	PO1
	b)	Assess the minimum number spanning tree possible for a complete graph with **n** vertices.	6 Marks	L5	CO2	PO2
		(OR)				
10.	a)	Illustrate Kruskal's algorithm to find the minimum spanning tree of a graph.	6 Marks	L3	CO2	PO1
	b)	Explain weakly connected graph and strongly connected graph with example.	6 Marks	L5	CO2	PO1

CODE No.: 19BT31201 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations January – 2022

DISCRETE MATHEMATICAL STRUCTURES

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Construct a truth table for $[(p \vee q) \wedge (\sim r)] \leftrightarrow q$.	6 Marks	L2	CO1	PO1
	b)	Determine whether the following inference is valid or faulty. If the inference is valid, provide some evidence which will confirm its validity. If the inference is faulty, provide a combination of truth values that indicate a fallacy. "If today is Ramu's birthday, then today is October 21. Today is October 21. Hence, today is Ramu's birthday."	6 Marks	L4	CO1	PO4
		(OR)				
2.	a)	Verify that the following argument is valid by translating in to symbols and using truth tables to check for tautologies. "If Raghu is a mathematician, then he is ambitious. If Raghu is early riser, then he does not like eat meal. If Raghu is ambitious, then he is an early riser. Hence, if Raghu is a mathematician, then he does not like eat meal."	6 Marks	L3	CO1	PO4
	b)	Find the disjunctive normal form of $\sim (p \vee q) \leftrightarrow (p \wedge q)$.	6 Marks	L2	CO1	PO1

UNIT-II

3.	a)	If the relations R and S are both reflexive, show that $R \cup S$ and $R \cap S$ are also reflexive.	6 Marks	L3	CO2	PO1
	b)	Determine that the poset ({1, 3, 6, 9, 12}, /) is a lattice and also prove that it is a distributive lattice.	6 Marks	L3	CO2	PO1
		(OR)				
4.	a)	Define lattice. Illustrate properties of lattices.	6 Marks	L2	CO2	PO1
	b)	Draw a poset diagram for the poset (A, /), where A = {2, 3, 4, 9, 12, 18}.	6 Marks	L2	CO2	PO1

UNIT-III

5.	a)	Examine whether a semi group with more than idempotent can be a group or not. Justify your answer by giving an example.	6 Marks	L3	CO3	PO2
	b)	If N is the set of positive integers and * denotes the least common multiple on N, show that (N, *) is a commutative semi group. Find the identity element of *.	6 Marks	L3	CO3	PO1
		(OR)				

6.	a)	Define the following: i) group. ii) sub group. iii) semi group. iv) monoid.	6 Marks	L1	CO3	PO1
	b)	If S = NxN is the set of ordered pairs of positive integers and * is an operation on S defined by (a, b)*(c, d) = (a + c, b + d), then show that (S, ∗) is semi group. If f: (S, ∗) → (Z, +) is defined by f(a, b) = a – b, then prove that f is homomorphism.	6 Marks	L2	CO3	PO3

UNIT-IV

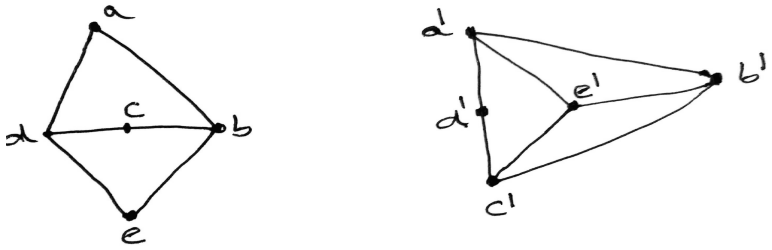
7.	a)	There are 250 students in an engineering college of these 188 have taken a course in Fortran, 100 have taken a course in C and 35 have taken a course in Java. Further 88 have taken courses in both Fortran and C, 23 have taken courses in both C and Java, and 29 have taken courses in both Fortran and Java. If 19 of these students have taken all the three courses, how many of these 250 students have not taken a course in any of these programming languages?	6 Marks	L3	CO4	PO2
	b)	How many bit strings of length 10 have i) exactly three 0's? ii) at least three 1's? iii) an odd number of 0's?	6 Marks	L3	CO4	PO1

(OR)

8.	a)	Identify the coefficient of x^{14} in $(1 + x + x^2 + x^3 + x^4 + \ldots + x^8)^{10}$.	6 Marks	L4	CO4	PO2
	b)	Solve the recurrence relation $u_n + 7\ u_n\text{-}1 + 8\ u_n\text{-}2 = 0$ for $n \geq 2$, $u_0 = 1$, $u_1 = -2$.	6 Marks	L4	CO4	PO2

UNIT-V

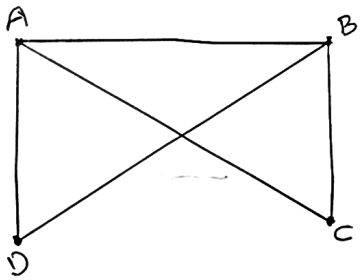
9.	a)	Determine whether the following graphs are isomorphic.	6 Marks	L4	CO5	PO3



	b)	Prove that a tree with n vertices has exactly n – 1 edges.	6 Marks	L2	CO5	PO1

(OR)

10	a)	Illustrate Depth-First search algorithm with an example.	6 Marks	L2	CO5	PO1
·	b)	Define spanning tree. Draw all the spanning trees of the following graph.	6 Marks	L2	CO5	PO4



❀ ❀ ❀

CODE No.: 19BT3BS01 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC19) Supplementary Examinations July – 2022

NUMERICAL METHODS, PROBABILITY AND STATISTICS
[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Find the root of the equation $2x - \log_{10} x = 7$, which lies between 3.5 and 4 by Regula –Falsi method. — 6 Marks L1 CO1 PO1

   b) Using the technique of Lagrange's interpolation, express the function $f(x) = \frac{3x^2 + x + 1}{(x-1)(x-2)(x-3)}$ as a sum of partial fractions. — 6 Marks L3 CO1 PO2

(OR)

2. a) Derive a recurrence formula for the reciprocal of a natural number N by Newton-Raphson method and hence find the reciprocal of 18. — 6 Marks L3 CO1 PO1

   b) State Newton's backward interpolation formula and using it evaluate cos73° from the following data — 6 Marks L1 CO1 PO1

x°	10	20	30	40	50	60	70	80
Cos x°	0.9848	0.9397	0.866	0.766	0.6428	0.500	0.342	0.1737

UNIT-II

3. a) The following data gives corresponding values of pressure(p) and specific volume(v) of superheated system. — 6 Marks L5 CO1 PO2

v	2	4	6	8	10
p	10.5	42.7	25.3	16.7	13

evaluate the rate of change of pressure with respect to volume when $v = 2$.

   b) State Simpson's $\frac{1}{3}$ rule and applying it evaluate $\int_0^{\frac{\pi}{2}} \sqrt{\sin\theta}\, d\theta$ for taking six subintervals. — 6 Marks L1 CO1 PO1

(OR)

4. a) Using Simpson's $\frac{3}{8}$ rule evaluate $\int_0^6 \frac{dx}{1+x^2}$ by dividing the range into six equal parts. — 6 Marks L3 CO1 PO1

   b) Find $y(0.1)$ using Taylor's series method given that $\frac{dy}{dx} = xy + 1$ *and* $y(0) = 1$. — 6 Marks L1 CO1 PO2

UNIT-III

5. a) A random variable X has the following probability function — 6 Marks L1 CO2 PO1

$X=x$	0	1	3	4	5	6	7
$P(X=x)$	0	k	$2k$	$2k$	$3k$	k^2	$7k^2+k$

Find: i) k ii) $P(X < 6)$ iii) $P(0 < X < 5)$.

b) A continuous random variable X has a probability density function given by $f(x) = \begin{cases} kxe^{-\lambda x}, & x \geq 0, \lambda > 0 \\ 0, & otherwise \end{cases}$ Determine the value of k and obtain the mean and variance of X. — 6 Marks L3 CO2 PO1

(OR)

6. a) A die is tossed thrice. A success is getting 1 or 6 on a toss. Find the mean and variance of the number of successes. — 6 Marks L1 CO2 PO2

b) If X is a continuous random variable with probability density function is given by $f(x) = \begin{cases} x^2, & 0 \leq x \leq 1 \\ 0, & otherwise \end{cases}$ — 6 Marks L5 CO2 PO1

if $P(a \leq x \leq 1) = \frac{19}{81}$ then estimate the value of a.

UNIT-IV

7. a) In eight throws of a die 5 or 6 is considered a success. Find the mean number of success and the standard deviation. — 6 Marks L1 CO2 PO1

b) A hospital switch board receives an average of 4 emergency calls in a 10 minute interval. Applying appropriate probability techniques, estimate the probability that — 6 Marks L3 CO2 PO2

i) there are at most 2 emergency calls in a 10 minute interval.

ii) there are exactly 3 emergency calls in a10 minute interval.

(OR)

8. a) If two cards are drawn from a pack of 52 cards which are diamonds, using Poisson distribution find the probability of getting two diamonds at least 3 times in 51 consecutive trials of two cards drawing each time. — 6 Marks L3 CO2 PO1

b) Suppose the weights of 800 male students are normally distributed with mean 140 pounds and standard deviation 10 pounds. Find the number of students whose weights are — 6 Marks L1 CO2 PO1

i) between 138 and 148 pounds.

ii) more than 152 pounds.

UNIT-V

9. a) Explain briefly about : — 6 Marks L2 CO2 PO1

i) critical region. ii) level of significance.

iii) degrees of freedom.

b) The time taken by workers in performing a job by method I and method II is given below: — 6 Marks L3 CO2 PO4

Method I	20	16	26	27	23	22	-
Method II	27	33	42	35	32	34	38

Using appropriate statistical technique analyse the data show that the variances of time distribution from population from which these samples are drawn do not differ significantly.

(OR)

10.	a)	In a random sample of 100 packages shipped by air freight 13 had some damage. Construct 95% confidence interval for the true proportion of damage package.	6 Marks	L3	CO2	PO1
	b)	A random sample of 6 steel beams has a mean compressive strength of 58392 *psi* with a standard deviation of 648 *psi*. Use this information at level of significance ($\alpha = 0.05$) to test whether the true average compressive strength of the steel from which this sample came is 58,000 *psi*. Assume normally.	6 Marks	L4	CO2	PO4

CODE No.: 19BT3BS02 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC19) Supplementary Examinations July – 2022

SPECIAL FUNCTIONS AND COMPLEX ANALYSIS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Show that $\Gamma(n)\Gamma(1-n)=\frac{\pi}{\sin n\pi}$ and hence evaluate $\Gamma\left(\frac{1}{4}\right)\Gamma\left(\frac{3}{4}\right)$.	12 Marks	L1	CO1	PO1
		(OR)				
2.		Define Beta and Gamma functions and express $\int_0^1 x^m(\log x)^n\,dx$ in terms of gamma function, where n is a positive integer and m > – 1.	12 Marks	L2	CO1	PO1

UNIT-II

3.	a)	State Generating function for Legendre polynomial $P_n(x)$ and show that $P_3(x)=\frac{1}{2}(5x^3-3x)$.	6 Marks	L2	CO1	PO2
	b)	State and prove the orthogonality formula for Bessel function $J_n(x)$.	6 Marks	L1	CO1	PO1
		(OR)				
4.	a)	Establish the recurrence relation $(2n+1)\,xP_n(x)=(n+1)P_{n+1}(x)+nP_{n-1}(x), n\geq 1$.	6 Marks	L2	CO1	PO2
	b)	Identify a suitable relation between $J_{n-1}(x), J_n(x)$ *and* $J_{n+1}(x)$ and hence rewrite $J_4(x)$ in terms of $J_0(x)$ *and* $J_1(x)$.	6 Marks	L2	CO1	PO2

UNIT-III

5.		Separate the real and imaginary parts of log z and find ρ such that $f(z)=\frac{1}{2}\log(x^2+y^2)+i\tan^{-1}\left(\frac{px}{y}\right)$ is analytic.	12 Marks	L3	CO2	PO1
		(OR)				
6.	a)	Define fixed point of a bilinear transformation and find the fixed points of the transformation $w=\frac{2i-6z}{iz-3}$.	6 Marks	L2	CO2	PO1
	b)	Making use of the transformation $w=z+3+2i$, establish the image for the circle $\lvert z\rvert=2$.	6 Marks	L3	CO2	PO2

UNIT-IV

7.	a)	Evaluate the integral $\int_C \frac{\sin\pi z^2 + \cos\pi z^2}{(z-1)(z-2)}dz$ where C is the circle $\|z\| = 3$ using Cauchy's Integral formula.	6 Marks	L2	CO2	PO2
	b)	Construct a series containing positive and negative powers of (z -1) for the function $f(z) = \frac{z}{(z-1)(z-3)}$.	6 Marks	L3	CO2	PO2
		(OR)				
8.	a)	Determine the value of $f(2)$ if $f(a) = \int_C \frac{(2z^2 - z - 2)}{(z-a)}dz$ where c is the circle $\|z\| = 2.5$ using Cauchy's Integral formula.	6 Marks	L2	CO2	PO1
	b)	Establish Laurent's series for $f(z) = \frac{1}{z^2 - 3z + 2}$ in the region $0 < \|z-1\| < 1$.	6 Marks	L2	CO2	PO2

UNIT-V

9.		Define the residue and find the poles and corresponding residues of the function $f(z) = \frac{z^2 - 2z}{(1+z)^2(z^2+1)}$.	12 Marks	L2	CO2	PO1
		(OR)				
10.		Show that $\int_0^{2\pi} \frac{\cos 2\theta}{1 - 2a\cos\theta + a^2}d\theta = \frac{2\pi a^2}{1-a^2}$ $(a^2 < 1)$ by complex variable technique.	12 Marks	L3	CO2	PO2

CODE No.: 19BT30102 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC19) Supplementary Examinations July – 2022

FLUID MECHANICS

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	List the different types of fluid properties. Explain any five properties.	6 Marks	L2	CO1	PO1 PO10
	b)	Calculate the specific weight, specific mass, specific volume and specific gravity of a liquid having a volume of 8 m^3 and weight of 48 kN.	6 Marks	L4	CO1	PO1 PO2
		(OR)				
2.	a)	What are manometers? Explain briefly the following with neat sketch: i) Piezometer ii) U-tube manometer	6 Marks	L2	CO1	PO1 PO10
	b)	A simple manometer (U-tube) containing mercury is connected to a pipe in which an oil of specific gravity 0.8 is flowing. The pressure in the pipe is vacuum. The other end of the manometer is open to atmosphere. Find the vacuum pressure in pipe, if the difference of mercury level in the two limbs is 200 mm and height of oil in the left-limb from the center of the pipe is 150 mm below.	6 Marks	L4	CO1	PO1 PO2 PO5 PO10
		UNIT-II				
3.	a)	Differentiate between the Eulerian and Lagrangian methods of representing fluid flow. Write the expressions for convective and local accelerations.	6 Marks	L4	CO2	PO1 PO2 PO5
	b)	Determine the missing component of velocity distribution $\mathbf{u = 2x^2 + 2xy}$, $\mathbf{v = 2yz^2 + 3z^2}$, $\mathbf{w = ?}$, such that they satisfy continuity equation.	6 Marks	L4	CO2	PO1 PO2
		(OR)				
4.	a)	Derive Euler's equation of motion with a neat sketch.	6 Marks	L4	CO2	PO1 PO2 PO5 PO10
	b)	The water is flowing through a pipe having diameters 200 mm and 100 mm at sections 1 and 2 respectively. The rate of flow through the pipe is 35 liters/s. The section 1 is 6 m above datum and section 2 is 4 m above datum. If the pressure at section 1 is 400 kN/m^2, find the intensity of pressure at section 2.	6 Marks	L4	CO2	PO1 PO2 PO4 PO10
		UNIT-III				
5.	a)	List the various types of losses and explain briefly.	6 Marks	L2	CO3	PO1 PO10
	b)	In a pipe of diameter 350 mm and length 75 m water is flowing at a velocity of 2·8 m/s. Find the head lost due to friction using: i) Darcy-Weisbach formula; ii) Chezy's formula for which C = 55.	6 Marks	L4	CO3	PO1 PO2 PO4 PO5

						PO10
		(OR)				
6.	a)	Describe venturimeter and find an expression for measuring discharge of fluid through a pipe with this device.	6 Marks	L4	CO3	PO1 PO2 PO5 PO10
	b)	In an 80 mm diameter pipeline an oil of specific gravity 0·8 is flowing at the rate of 0·0125 m^3/s. A sudden expansion takes place into a second pipeline of such diameter that maximum pressure rise is obtained. Find: i) Loss of energy in sudden expansion, ii) Differential gauge length indicated by an oil-mercury manometer connected between the two pipes.	6 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO10
		UNIT-IV				
7.	a)	Define Couette flow and describe flow of viscous fluid between two parallel plates.	6 Marks	L2	CO5	PO1 PO10
	b)	Two parallel plates kept 100 mm apart have laminar flow of oil between them with a maximum velocity of 1.5 m/s. Calculate discharge per meter width, shear stress at the plates, difference in pressure between two points 20 m apart and velocity gradient at the plates.	6 Marks	L4	CO5	PO1 PO2 PO4
		(OR)				
8.	a)	Obtain an expression for velocity distribution in turbulent flow for smooth pipes and rough pipes.	6 Marks	L4	CO5	PO1 PO2 PO4
	b)	The velocities of water through a pipe of diameter 10 cm are 4 m/s and 3.5 m/s at the center of the pipe and 2 cm from the pipe center respectively. Determine the wall shearing stress in the pipe for turbulent flow.	6 Marks	L4	CO5	PO1 PO2 PO4
		UNIT-V				
9.	a)	Define dimensional analysis and explain the principle of dimensional homogeneity. Describe the procedure for obtaining the relationship between dependent and independent variables using Rayleigh's method.	6 Marks	L3	CO6	PO1 PO5
	b)	Derive the relationship for drag force on a smooth sphere of diameter D immersed in a liquid of mass density ρ and dynamic viscosity μ and moving with a velocity V using Rayleigh's method.	6 Marks	L4	CO6	PO1 PO2 PO5
		(OR)				
10.		Explain Froude model law. A 1:64 model is constructed of an open channel in concrete which has Manning's N =0.014. Find the value of N for the model.	12 Marks	L4	CO6	PO1 PO2 PO4 PO5

CODE No.: 19BT30103 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC19) Supplementary Examinations July – 2022

MECHANICS OF SOLIDS

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	A simply supported beam of span 6m has overhang on both sides with the left overhang spanning 1.5m and the right overhang spanning 2m. A uniformly distributed load of intensity 3kN/m acts throughout in the central span and overhangs. Also, a point load of intensity 5kN acts at the mid span of simply supported beam. Determine the shear force and bending moment at the salient points. Draw SFD and BMD.	12 Marks	L4	CO1	PO1 PO2 PO4 PO10
		(OR)				
2.	a)	Determine the maximum shear force and bending moment of a cantilever beam of span 'l' carrying a uniformly distributed load of w per unit run over a distance of 'a' from the fixed end where a<l. Draw SFD and BMD.	6 Marks	L4	CO1	PO1 PO2 PO4 PO10
	b)	A simply supported beam of 8m span has a central point load of 15kN. Determine the maximum shear force and bending moment. Draw shear force diagram and bending moment diagram.	6 Marks	L4	CO1	PO1 PO2 PO4 PO10
		UNIT-II				
3.	a)	Derive the relation between average shear stress and the maximum shear stress for a rectangular section and draw the shear stress distribution diagram.	4 Marks	L4	CO2	PO1 PO2 PO4 PO10
	b)	A timber beam 150mm x 250mm in cross section is simply supported at its ends and has a span of 3.5m. The maximum safe allowable stress in bending is 7500kN/m^2. Find the maximum safe U.D.L. which the beam can carry. What is the maximum shear stress in the beam for the U.D.L. calculated?	8 Marks	L6	CO2	PO1 PO2 PO4 PO6 PO10
		(OR)				
4.		A cylindrical chimney, 22m high, of uniform circular cross section has 4m external diameter and 2m internal diameter. The intensity of horizontal wind pressure is 1.2kN/m^2. Find the maximum and minimum normal stress intensities at the section, if the specific weight of masonry is 22kN/m^3.	12 Marks	L4	CO3	PO1 PO2 PO6 PO10
		UNIT-III				
5.	a)	What are the assumptions in the theory of pure torsion? Derive the equation of torsion.	6 Marks	L4	CO4	PO1 PO2
	b)	Determine the diameter of the shaft which will transmit 120kW at 160m r.p.m if the shear strength in the shaft is limited to 75N/mm^2. Find also the length of the shaft, if the twist must not exceed 1° over the entire length. Take C=8x10^4 N/mm^2.	6 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO6

(OR)

6.	a)	An open coiled helical spring consist of 12 coils each of mean diameter 60mm, the wire forming the coil being 6mm in diameter. Each coil makes an angle of 30° with the plane perpendicular to the axis of spring. i) Determine the load required to elongate the spring by 25mm and the bending and the shear stress caused by the load. ii) Calculate the axial twist that would cause a bending stress of 50MN/m² in the coils. Take E=200GN/m² and C= 82GN/m².	8 Marks	L4	CO4	PO1 PO2 PO4 PO6
	b)	A closely coiled helical spring is to carry a load of 500N. Its mean coil diameter is to be 10 times that of the wire diameter. Calculate these diameters if the maximum shear stress in the material of the spring are to be 80MN/m².	4 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO6

UNIT-IV

7.	a)	Derive the expression for the stresses acting in an inclined plane due to the forces acting in only one direction.	6 Marks	L4	CO5	PO1 PO2 PO10
	b)	At a point in a strained material the normal stresses on two planes at right angles are 80N/mm² and 60N/mm² and both are tensile. Find graphically, the resultant intensity of stress on a plane inclined at 45° to the axis of maximum stress.	6 Marks	L4	CO5	PO1 PO2 PO6 PO10

(OR)

8.	a)	Explain in detail about Maximum Shear Stress theory.	6 Marks	L2	CO2	PO1
	b)	In a metallic body the principal stresses are +35MN/m² and -95MN/m², the third principal stress being zero. The elastic limit stress in simple tension as well as in simple compression is equal and is 220 MN/m². Find the factor of safety based on the elastic limit, if the criterion of the failure for the material is the maximum principal stress theory.	6 Marks	L6	CO2	PO1 PO2 PO6 PO10

UNIT-V

9.	a)	What are limitations due to which Euler's formula is of little practical use? Derive the Euler's formula when one end is fixed and other is free.	6 Marks	L4	CO6	PO1 PO2
	b)	A solid round bar 60mm in diameter and 2.5m long is used as a strut. One end of the strut is fixed, while the other end is hinged. Find the safe compressive load for this strut, using Euler's formula. Assume E = 200GN/m³ and the factor of safety = 3.	6 Marks	L4	CO6	PO1 PO2 PO5 PO6

(OR)

10.		A hollow cylindrical cast iron column is 4m long with both ends fixed. Determine the minimum diameter of the column, if it has to carry a safe load of 250kN with a factor of safety as 5. Take the internal diameter as 0.8 times the external diameter. Take a= 1/1600 in Rankine's formula and stress as 550MN/m².	12 Marks	L4	CO6	PO1 PO2 PO5 PO6

CODE No.: 19BT30104 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC19) Supplementary Examinations July – 2022

SURVEYING

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What are the principles of surveying? How do surveying influences the society, environment and sustainability?	6 Marks	L2	CO1	PO1 PO6 PO7 PO8
	b)	List out the tape corrections. Explain them in detail.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Differentiate between: i) Declination and Dip. ii) Fore bearing and Back bearing.	4 Marks	L4	CO1	PO1 PO2
	b)	The bearings of the lines of a traverse are given below. Correct the bearings for local attraction, if any, find the included angles.	8 Marks	L4	CO1	PO1 PO2 PO4 PO5

Line	Fore bearing	Back bearing
AB	S $36^0$15’ E	N $36^0$15’ W
BC	S $44^0$30’ W	N $45^0$30’ E
CD	N $71^0$45’ W	S $71^0$00’ E
DE	N $14^0$00’ E	S $14^0$30’ W
EA	N $61^0$15’ E	S $61^0$00’ W

UNIT-II

3.	a)	Discuss the radiation method of plane table surveying.	5 Marks	L3	CO1	PO1 PO5 PO10
	b)	Following readings were observed successively with a leveling instrument: 0.583, 1.010, 1.735, 3.295, 3.775, 0.350, 1.795, 2.575, 3.375, 3.895, 1.745, 0.635 and 1.605 m. The instrument was shifted after fourth and tenth readings. Design a page of level book and determine the reduced levels of various points by using rise and fall method, if RL of first point is 130.00 m.	7 Marks	L4	CO2	PO1 PO2 PO4
		(OR)				
4.	a)	How would you account for the following corrections in trigonometric leveling? i) Corrections due to refraction. ii) Correction due to curvature of earth.	6 Marks	L4	CO2	PO1 PO2
	b)	Write a short note on: i) Contour interval. ii) Horizontal equivalent. iii) Contour gradient.	6 Marks	L3	CO2	PO1

UNIT-III

5.	a)	List out the methods for measuring horizontal angle and explain any one method in detail.	4 Marks	L2	CO3	PO1 PO5
	b)	Calculate latitudes, departures, closing error and also adjust the traverse by Bowditch rule.	8 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO8

Line	Length (m)	WCB
AB	89.31	$45^0$10’
BC	219.76	$72^0$05’
CD	151.18	$161^0$52’
DA	159.10	$228^0$43’
EA	232.26	$300^0$42’

(OR)

6.	a)	What are the constants of a tacheometer and how are they determined?	5 Marks	L2	CO3	PO1
	b)	The observations were made on the top A of a flag AB on a hill from two instrument stations P and Q, 100m apart, the stations P and Q being in the line with A. The angles of elevation of A at P and Q were $30^0$05’ and $17^0$52’ respectively. The staff reading upon the BM (RL = 311.29 m) were 2.690 and 3.815 respectively, when the instrument was at P and Q, the telescope being horizontal. Determine the elevation of the foot B of the flag if AB is 3.5 m.	7 Marks	L4	CO3	PO1 PO2 PO4 PO10

UNIT-IV

7.	a)	The following offsets were taken from a chain line to a hedge at regular intervals of 5.0 m: 2.72, 3.46, 6.80, 4.86, 3.35, 2.50 and 1.60 m. Determine the area included between the chain line and the hedge by using: i) Mid-ordinate rule. ii) Trapezoidal rule. iii) Simpson’s rule.	6 Marks	L4	CO4	PO1 PO2 PO5
	b)	Derive an expression for the area of two-level section for cutting.	6 Marks	L4	CO4	PO1 PO2

(OR)

8.	a)	Define “Degree of curve” by arc definition and chord definition.	4 Marks	L2	CO5	PO1
	b)	Derive an expression for Rankine’s deflection angle and explain the setting out a simple curve by Rankine’s deflection angle method.	8 Marks	L6	CO5	PO1 PO3 PO5

UNIT-V

9.	a)	What is the working principle of total station? Write down the applications of total station.	6 Marks	L2	CO6	PO1 PO5
	b)	How to determine the remote height of a point using total station?	6 Marks	L4	CO6	PO1 PO2 PO5

(OR)

10.	a)	Differentiate between interior drone surveying and exterior drone surveying.	6 Marks	L4	CO6	PO1 PO2 PO5
	b)	Explain the procedure for the calculation of stockpile volume in drone surveying.	6 Marks	L4	CO6	PO1 PO2 PO5

❀ ❀ ❀

CODE No.: 19BT30202 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC19) Supplementary Examinations July – 2022

ELECTROMAGNETIC FIELDS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	State and prove Gauss Law in point form.	6 Marks	L2	CO1	PO1
	b)	Find the total charge in a volume defined by the six planes for which $1 \le x \le 2$, $2 \le y \le 3$ and $3 \le z \le 4$, if $\overline{D} = 3x\overline{a}_x + 2y^2\overline{a}_y + z^3\overline{a}_z C/m^2$.	6 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Derive the expression for electric field intensity due to an infinite line charge.	6 Marks	L3	CO1	PO1
	b)	An electrostatic field is given by $\overline{E} = 8xy\overline{a}_x + 4x^2\overline{a}_y + 2\overline{a}_z \ V/m$. A charge of 6C is to be moved from B (1, 8, 5) to A (2, 18, 6). Find the work done in each of the following cases, i) The path selected is $y = 3x^2 + z,\ z = x + 4$. ii) The straight line from B to A. Show that work done remains same and is independent of the path selected.	6 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Derive the expressions for potential and electric field intensity due to a dipole.	6 Marks	L2	CO1	PO1
	b)	A capacitor consists of square shape metal plates of each 80cm side, placed parallel and 3mm apart. The space between the plates is filled with a dielectric having a relative permittivity of 3. A potential difference of 300 V is maintained between the plates. Calculate i) the capacitance ii) charge on the capacitor iii) the electric flux density iv) energy stored in the capacitor.	6 Marks	L3	CO1	PO2
		(OR)				
4.	a)	Explain the boundary conditions between conductor and free space for electric fields.	6 Marks	L2	CO1	PO1
	b)	For the current density $\overline{J} = 10z\sin^2\phi\ \overline{a}_\rho \ A/m^2$, determine the current through the cylindrical surface $\rho = 2$, $1 \le z \le 5$ m.	6 Marks	L3	CO1	PO2

UNIT-III

5.	a)	Using Ampere's circuital Law, obtain an expression for magnetic field intensity due to an infinite sheet of current carrying conductor.	8 Marks	L3	CO2	PO5
	b)	Derive an expression for vector magnetic potential.	4 Marks	L3	CO2	PO1
		(OR)				
6.		Derive Maxwell's III and IV equations, and elucidate the significance of their point and integral form.	12 Marks	L3	CO2	PO1

UNIT-IV

7.	a)	Derive the Lorentz force equation.	6 Marks	L3	CO2	PO1
	b)	A point charge of Q = -1.2C has velocity of $\vec{v} = 5\vec{a}_x + 2\vec{a}_y - 3\vec{a}_z \, m/s$. Find the magnitude of the force exerted on the charge, i) if the electric field intensity is $\vec{E} = -18\vec{a}_x + 5\vec{a}_y - 10\vec{a}_z \, V/m$. ii) if the flux density is $\vec{B} = -4\vec{a}_x + 4\vec{a}_y + 3\vec{a}_z \, wb/m^2$.	6 Marks	L3	CO2	PO2

(OR)

8.	a)	Derive an expression for self-inductance of a solenoid.	6 Marks	L3	CO2	PO1
	b)	A solenoid of 500 turns has a length of 50cm and the radius of 10cm. A steel rod of circular cross-section is fitted in the solenoid coaxially. Relative permeability of steel is 3000. A DC current of 10 A is passed through solenoid. Compute inductance of the system, energy stored in the system and mean flux density inside the solenoid.	6 Marks	L3	CO2	PO2

UNIT-V

9.		State and explain the differential and integral forms of Maxwell's equations for time varying fields.	12 Marks	L2	CO3	PO1

(OR)

10.	a)	Differentiate between transformer EMF and Generator EMF	6 Marks	L2	CO3	PO1
	b)	A lossy dielectric has μ_r = 1.5, ε_r = 1, σ = 2 x 10^{-8}S/m and $\vec{E} = 100 \sin \omega t \, \vec{a}_z \, V/m$. i) Determine at what frequency the conduction and displacement currents are equal. ii) Calculate instantaneous displacement current density at that frequency.	6 Marks	L3	CO3	PO2

CODE No.: 19BT30203 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC19) Supplementary Examinations July – 2022

SIGNALS AND NETWORKS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

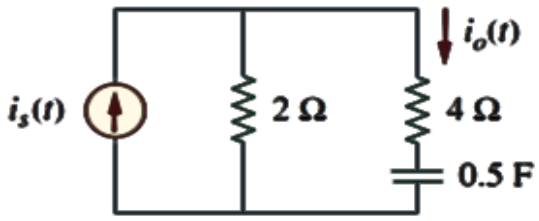
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Verify whether the following system is stable or unstable whose impulse response is: $h(t) = 2e^{-3t}\cos t\,u(t)$.	6 Marks	L3	CO1	PO2
	b)	Find the odd and even component of the signal defined by $x[n] = \{3,2,1,4,5\}$, consider the origin at third element.	6 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Investigate the periodicity of the signal and determine the period of the signal defined by $x(t) = 0.1e^{-j\frac{2\pi}{3}n} + 0.3\sin\pi n$.	6 Marks	L4	CO1	PO2
	b)	Investigate whether the signal $x(t) = u(t) - u(t-1)$ is energy signal or power signal.	6 Marks	L4	CO1	PO2

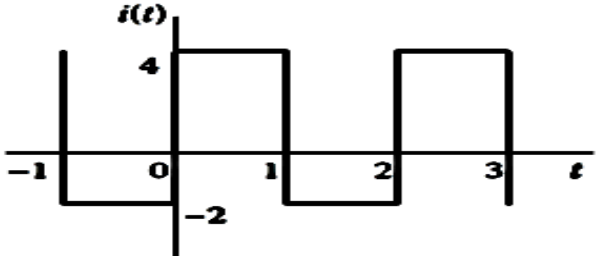
UNIT-II

3.	a)	Find the inverse Fourier transforms of the following function: $F(w) = \frac{10jw}{(-jw+2)(jw+3)}$.	4 Marks	L3	CO2	PO5
	b)	Using the Fourier transform method, find $i_o(t)$ shown in the figure if $i_s(t) = 10\sin 2t$ A.	8 Marks	L3	CO2	PO5



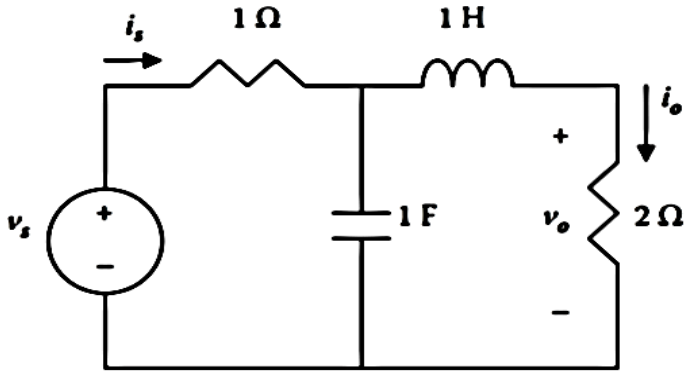
(OR)

4.	a)	Find the inverse Fourier transforms of the following function: $F(w) = \frac{jw}{-w^2 + j5w + 6}$.	4 Marks	L3	CO2	PO5
	b)	The periodic current waveform in Figure is applied across a 2 kΩ resistor. Find the percentage of the total average power dissipation caused by the DC component.	8 Marks	L3	CO2	PO2



UNIT-III

5.	a)	For the circuit in figure, find $H(s) = V_o(s)/V_s(s)$. Assume zero initial conditions.	6 Marks	L3	CO2	PO2



	b)	Find the time domain initial and final values of the following z-domain function: $X(z) = \dfrac{z^2}{(z-1)(z-0.2)}$.	6 Marks	L3	CO2	PO2

(OR)

6.	a)	Obtain the inverse Laplace transforms of the function: $X(s) = \dfrac{3}{s^2(s+3)(s+2)}$.	6 Marks	L3	CO2	PO2
	b)	Using z-transforms, determine the response of a system for an input $x[n] = 0.2^n u[n]$, if the impulse response of the system is $h[n] = 0.4^n u[n]$.	6 Marks	L3	CO2	PO5

UNIT-IV

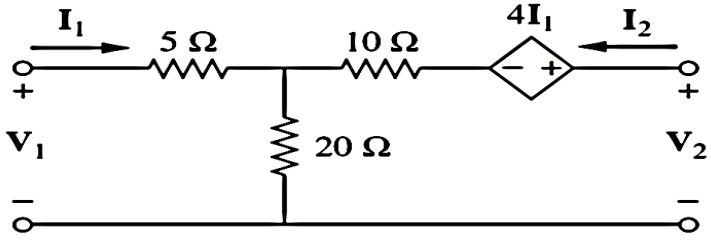
7.	a)	Explain the transient properties of a capacitor for DC and AC excitations.	4 Marks	L2	CO3	PO1
	b)	A series RC circuit with R = 100Ω and C = 25 micro farads has a sinusoidal excitation $V(t)$ = 200 sin 500t. Find the expression for the current using Laplace method assuming that the capacitor is initially unchargeds.	8 Marks	L3	CO3	PO5

(OR)

8.	a)	Explain why the current in a pure inductance cannot change in zero time.	4 Marks	L2	CO3	PO1
	b)	The coil of a certain relay is operated by a 12-V battery. If the coil has a resistance of 150Ω and an inductance of 30 mH and the current needed to pull in is 50 mA, calculate the relay delay time and its response.	8 Marks	L3	CO3	PO2

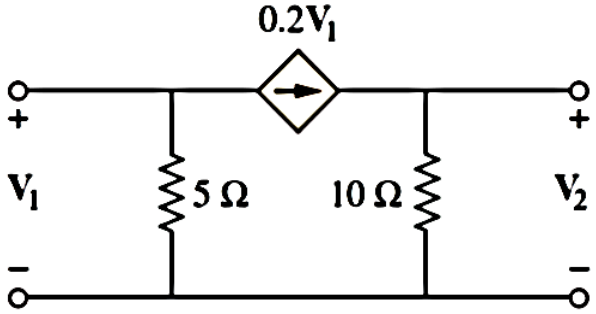
UNIT-V

9.	a)	Y-parameters for a two port network are given as Y_{11} = 0.75, $Y_{12} = Y_{21}$ = -0.25, Y_{22} = 0.8. Design an equivalent π-network.	6 Marks	L4	CO4	PO3
	b)	Compute the z parameters of the circuit in figure and invistigate whether the netwok is symmetrical and reciprocal.	6 Marks	L4	CO4	PO4



(OR)

10.	a)	Define reciprocity and symmetry for a generalized two port network and derive the conditions for reciprocity and symmetry in terms of impedance parameters.	4 Marks	L3	CO4	PO1
	b)	Obtain the admittance parameter equivalent circuit of the two-port in figure and invistigate whether the netwok is symmetrical and reciprocal.	8 Marks	L3	CO4	PO4



❀ ❀ ❀

CODE No.: 19BT30301 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC19) Supplementary Examinations July – 2022

ENGINEERING THERMODYNAMICS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What is meant by point and path function? Explain with one example each.	6 Marks	L2	CO1	PO1
	b)	To a closed system 150kJ of work is supplied. If the initial volume is 0.6m^3 and pressure of the system changes as p = 8 – 4V, where p is in bar and V is in m^3, determine the final volume and pressure of the system.	6 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Discuss the First Law of Thermodynamics applied to a process in a closed.	6 Marks	L2	CO1	PO2
	b)	Two streams of air, one at 1 bar, 27^{0}C and velocity of 30 m/s and the other at bar, 227^{0}C and velocity of 50 m/s mix in equal proportion in a chamber from which heat at the rate of 100 kJ/kg is removed. The mixture is then passed through an adiabatic nozzle. Find the velocity of the stream issuing out of the nozzle. The temperature of the air leaving the nozzle is 27^{0}C and its Cp = 1.005 kJ/kgK .	6 Marks	L3	CO1	PO2

UNIT-II

3.	a)	State and prove Carnot's theorem.	6 Marks	L1	CO1	PO1
	b)	A heat engine drives a heat pump. The heat delivered by the heat engine as well as by the pump is used to heat the water circulating through the heat radiators of a building. The efficiency of the heat engine is 27% and the coefficient of performance of heat pump is 4. Calculate the ratio of heat transferred to the circulating water to the heat taken by the heat Engine.	6 Marks	L3	CO1	PO2
		(OR)				
4.	a)	Discus the concept of principle entropy increases.	6 Marks	L2	CO1	PO1
	b)	1 kg of ice at -10^{0}C is exposed to the atmosphere which is at 25^{0}C. The ice melts and comes in contact with the atmosphere. i) Determine the entropy increase of the universe, ii) What is the minimum amount of work necessary to convert the water back into ice at 10^{0}C? Cp of ice is 2.093 kJ/kgK and the latent heat of fusion of ice is 333 kJ/kg.	6 Marks	L3	CO1	PO2

UNIT-III

5.	a)	Draw the phase change process for pure substance or steam formation and explain	6 Marks	L2	CO2	PO2
	b)	A closed vessel of 0.2 cubic meter contains steam at 1 Mpa and temperature of 250 deg C. If the vessel is cooled so that pressure falls to 350kPa, determine the final temperature, heat transfer and change in entropy during the process.	6 Marks	L3	CO2	PO2
		(OR)				

6.		Derive the Maxwell relations and explain their importance in thermodynamics.	12 Marks	L3	CO1	PO2

UNIT-IV

7.		What is compressibility factor? What does it signify? What is its value for an ideal gas at critical point?	12 Marks	L1	CO3	PO2

(OR)

8.	a)	Explain the Dalon's law of partial pressures for mixture of gases.	6 Marks	L2	CO3	PO1
	b)	Following is the gravimetric analysis of air: Oxygen-23.14%, Nitogen-75.53%, Argon-1.28%, Carbon dioxide-0.05% Calculate analysis by volume and the partial pressure of each constituent when total pressure is 1bar.	6 Marks	L3	CO3	PO2

UNIT-V

9.	a)	Derive an expression for the thermal efficiency of Otto Cycle and draw P-V and T- S diagrams.	6 Marks	L3	CO4	PO2
	b)	The swept volume of a diesel engine working on dual cycle is 0.0053m^3 and clearance volume is 0.00035m^3. The maximum pressure is 65 bar. Fuel injection ends at 5 per cent of the stroke. The temperature and pressure at the start of the compression are 80°C and 0.9 bar. Determine the air standard efficiency of the cycle. Take γ for air = 1.4.	6 Marks	L3	CO4	PO2

(OR)

10.	a)	Derive an expression for the thermal efficiency of stirling cycle and draw P-V and T- S diagrams.	6 Marks	L3	CO4	PO2
	b)	The efficiency of an Otto cycle is 60% and γ=1.5. What is the compression ratio?	6 Marks	L3	CO4	PO2

CODE No.: 19BT30302 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

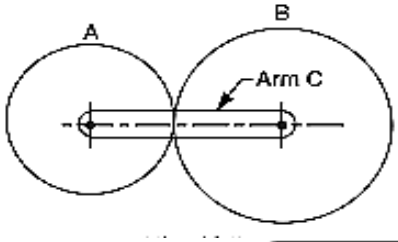
II B.Tech I Semester (SVEC19) Supplementary Examinations July – 2022

KINEMATICS OF MACHINERY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

	UNIT-I				
1.	Write notes on complete and incomplete constraints in lower and higher pairs, illustrating your answer with neat sketches.	12 Marks	L2	CO1	PO1
	(OR)				
2.	Sketch and describe the working of two different types of quick return mechanisms. Give examples of their applications.	12 Marks	L2	CO1	PO1
	UNIT-II				
3.	Give a neat sketch of the straight line motion 'Hart mechanism.' Prove that it produces an exact straight line motion.	12 Marks	L3	CO2	PO1 PO2
	(OR)				
4.	What is the condition for correct steering? Sketch and show the two main types of steering gears and discuss their relative advantages.	12 Marks	L3	CO3	PO1 PO2
	UNIT-III				
5.	Derive an expression for the length of the arc of contact in a pair of meshed spur gears.	12 Marks	L4	CO4	PO1 PO3
	(OR)				
6.	In an epicyclic gear train, an arm carries two gears A and B having 36 and 45 teeth respectively. If the arm rotates at 150 r.p.m. in the anticlockwise direction about the centre of the gear A which is fixed, determine the speed of gear B. If the gear A instead of being fixed, makes 300 r.p.m. in the clockwise direction, what will be the speed of gear B ? 	12 Marks	L4	CO4	PO1 PO2 PO3
	UNIT-IV				
7.	A cam is to be designed for knife edge follower with the following data: i) Cam lift =40 mm during 90^0 of cam rotation with SHM. ii) Dwell for next 30^0 iii) During the next 60^0 of cam rotation, the follower returns to its original position with uniform acceleration iv) Dwell during the remaining 180^0. Draw the profile of the cam when the line of stroke is offset by 20 mm from the axis of the cam shaft. The radius of the base circle of the cam is 40 mm. Determine the maximum velocity and acceleration of the follower during its ascent and descent, if the cam rotates at 240 r.p.m.	12 Marks	L3	CO6	PO1 PO2 PO3

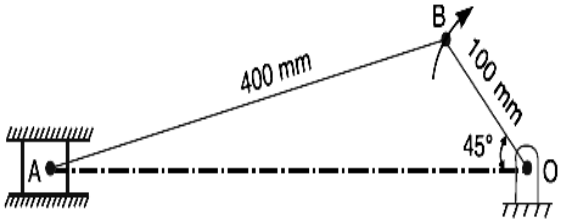
(OR)

8.	A cam rotating clockwise at a uniform speed of 1000 r.p.m. is required to give a roller follower the motion defined below : i) Follower to move outwards through 50 mm during 120^0 of cam rotation, ii) Follower to dwell for next 60^0 of cam rotation, iii) Follower to return to its starting position during next 90^0 of cam rotation, iv) Follower to dwell for the rest of the cam rotation. The minimum radius of the cam is 50 mm and the diameter of roller is 10 mm. The line of stroke of the follower is off-set by 20 mm from the axis of the cam shaft. If the displacement of the follower takes place with uniform and equal acceleration and retardation on both the outward and return strokes, draw profile of the cam and find the maximum velocity and acceleration during out stroke and return stroke.	12 Marks	L3	CO5	PO1 PO2 PO3

UNIT-V

9.	A mechanism, as shown in Fig. 6.31, has the following dimensions: O_1A = 60 mm; A B = 180 mm ; O_2 B = 100 mm ; O_2 C = 180 mm and CD = 270 mm. The crank O_1 A rotates clockwise at a uniform speed of 120 r.p.m. The block D moves in vertical guides. Find, by instantaneous centre method, the velocity of D and the angular velocity of CD.	12 Marks	L4	CO6	PO1 PO2 PO3

(OR)

10.	Locate all the instantaneous centres of the slider crank mechanism as shown in Fig. The lengths of crank OB and connecting rod AB are 100 mm and 400 mm respectively. If the crank rotates clockwise with an angular velocity of 10 rad/s, find: i) Velocity of the slider A, and ii) Angular velocity of the connecting rod AB.  	12 Marks	L4	CO6	PO1 PO2 PO3

CODE No.: 19BT30303 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC19) Supplementary Examinations July – 2022

MANUFACTURING TECHNOLOGY
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Elucidate the design considerations needed to be followed in Gating system.	6 Marks	L2	CO1	PO1 PO2 PO3
	b)	List types of gates and sketch any four of them.	6 Marks	L2	CO1	PO1 PO2
		(OR)				
2.	a)	Explain the purpose of chaplets and chillers used in casting process.	6 Marks	L2	CO1	PO1 PO2
	b)	List the types of cores. What are the advantages and applications of sand core?	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	What are the limitations of sand casting over special casting processes?	6 Marks	L2	CO2	PO1
	b)	Describe the lost wax process.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	List out various casting defects and explain any two with neat sketch.	6 Marks	L2	CO2	PO1 PO2
	b)	Write short notes on true centrifugal casting process with neat sketch.	6 Marks	L2	CO2	PO1
		UNIT-III				
5.	a)	Describe the principle of extrusion process. Compare both direct and indirect extrusion process with respect to mechanical properties.	6 Marks	L2	CO3	PO1 PO2
	b)	What is drawing process? Explain deep drawing process with a neat sketch.	6 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Explain explosive forming process.	6 Marks	L2	CO3	1,4,7
	b)	Explain the magnetic pulse forming process with a neat sketch.	6 Marks	L2	CO3	PO1 PO4 PO7
		UNIT-IV				
7.	a)	Explain the construction and working of laser beam welding with its advantages and limitations.	6 Marks	L2	CO4	PO1 PO2
	b)	List the welding defects with cause and remedies.	6 Marks	L1	CO4	PO1 PO2
		(OR)				
8.	a)	List out the non-destructive tests and explain any one of it.	6 Marks	L1	CO4	PO1
	b)	Discuss about brazing with neat sketch.	6 Marks	L2	CO4	PO1

UNIT-V

9.	a)	Describe the working principle of blow molding process.	6 Marks	L2	CO5	PO1 PO7
	b)	Describe properties of plastics.	6 Marks	L2	CO5	PO1
		(OR)				
10.	a)	Explain the principle of compression molding process.	6 Marks	L2	CO5	PO1 PO2
	b)	What are the additives to be mixed in processing plastics? Explain the purpose of each.	6 Marks	L2	CO5	PO1 PO2

CODE No.: 19BT30304 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC19) Supplementary Examinations July – 2022

STRENGTH OF MATERIALS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Establish the relation between bulk modulus and modulus of rigidity.	4 Marks	L3	CO1	PO1 PO2
	b)	An assembly of a steel bar of 70 mm diameter enclosed in an aluminium tube of 80 mm internal diameter and 120 mm external diameter is compressed between two rigid parallel plates by a force of 400 kN. The length of the assembly is 1 m. Determine the stresses in the tube and the bar if the young's moduli of elasticity of steel and aluminium are 200 GPa and 80 GPa respectively.	8 Marks	L3	CO1	PO1 PO2 PO3

(OR)

2.	a)	Sketch the stress-strain curve for a ductile material and label all the salient points with brief explanation.	6 Marks	L2	CO1	PO1 PO2
	b)	An axial pull of 40 kN is applied on a steel bar of diameter 12mm and length 2.5m. Calculate the change in length, diameter and volume of the bar if the Poisson's ratio is 0.25. Also find the work done in stretching the bar. Take $E = 2 \times 10^5$ N/mm².	6 Marks	L2	CO1	PO1 PO2

UNIT-II

3.		A simply supported beam of length 10m carries the uniformly distributed load and two point loads as shown Fig.1. Draw the shear force and bending moment diagrams for the beam. Also calculate the maximum bending moment.	12 Marks	L4	CO2	PO1 PO2 PO3

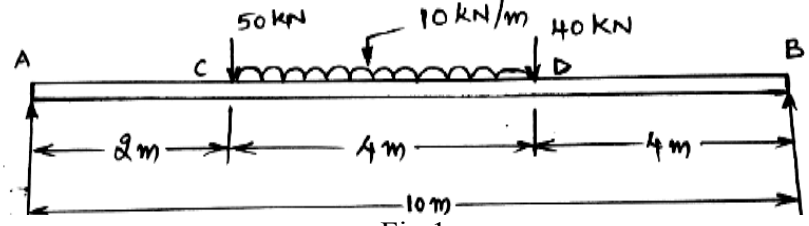


Fig.1

(OR)

4.	a)	Define bending moment, shear force and point of contra flexure.	4 Marks	L1	CO2	PO1 PO2
	b)	Draw shear force and bending moment diagrams for the Cantilever of 1.5 m long which carries a UDl of 3kN for entire span, and another load 1.5kN at a distance of 0.5 m from the free end.	8 Marks	L3	CO2	PO1 PO2 PO3 PO4

UNIT-III

5.	a)	Mention the assumptions made in bending equation.	4 Marks	L1	CO2	PO1 PO2
	b)	A beam of spam L meters simply supported at the ends, carries a central load W. The beam section has an overall depth of the 290mm and a vertical Web 250mm and 10mm. If the maximum shear stress is to be 45N/mm². When the maximum bending stress is 150N/mm². Calculate the value of the centrally applied.	8 Marks	L3	CO2	PO1 PO2 PO3

(OR)

6.	a)	Derive the relation to find the shear stress distribution in a beam with I cross section.	6 Marks	L3	CO2	PO1 PO2
	b)	A steel beam of 'T' section is 500 mm deep. Flange is 200mm wide and 50mm thick. The web is 15mm thick. The beam is subjected to a shear force of 300kN. Determine the shear stress distribution for the beam section. Also sketch the shear stress distribution.	6 Marks	L3	CO2	PO1 PO2

UNIT-IV

7.	a)	Derive the torsion equation from basics.	4 Marks	L3	CO3	PO1 PO2
	b)	A shaft transmits 300kW power at 120 r.p.m. Determine the necessary diameter of solid circular shaft and the necessary diameter of hollow circular section, the inside diameter being 2/3 of the external diameter. The allowable shear stress is 70N/mm^2. Taking the density at material as 77N/m^3, calculate the percentage saving in the shaft if hollow shaft is used.	8 Marks	L3	CO3	PO1 PO2

(OR)

8.		For a given loading conditions the state of stress in the wall of a cylinder is expressed as follows: i) 85 MN/m^2 tensile. ii) 25 MN/m^2 tensile at right angles to (a) iii) Shear stresses of 60 MN/m^2 on the planes on which the stresses Calculate the principal stresses and the planes on which they act. What would be the effect on these results if owing to a change of loading: i) becomes compressive while stresses. ii) remain unchanged.	12 Marks	L4	CO3	PO1 PO2 PO3

UNIT-V

9.	a)	Derive the expression for the slope and deflection of a cantilever beam of length L, carrying a point load W at the free end by double integration method.	6 Marks	L3	CO4	PO1 PO2
	b)	A Simply supported beam of span 6m loaded point load of 12kN at its centre, in addition to the UDL of 6kN/m for the whole span. Find slopes at the supports and maximum deflection. Use double integration method.	6 Marks	L3	CO4	PO1 PO2 PO3

(OR)

10.	a)	Find an expression for the slope at the supports of a simply supported beam, carrying a point load at the centre.	6 Marks	L3	CO4	PO1 PO2
	b)	A cantilever of length 3m carries a uniformly distributed load of 15kN/m over a length of 2m from the free end. If I =10^8mm^{4}and E=2 x 10^5 N/mm^2, find: i) Slope at the free end. ii) Deflection at the free end.	6 Marks	L3	CO4	PO1 PO2 PO3

CODE No.: 19BT30401 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC19) Supplementary Examinations July – 2022

ELECTROMAGNETIC FIELDS AND TRANSMISSION LINES
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	State Coulomb's law. Develop the vector expression for Force due to N number of Charges.	6 Marks	L1	CO1	PO2
	b)	A circular loop located on $x^2 + y^2 = 9$, $z = 0$ carries a direct current of 10 A along a$. Determine H at (0, 0, 4) and (0, 0, -4).	6 Marks	L4	CO1	PO4
		(OR)				
2.	a)	State Biot-savart's Law. Formulate an expression for Straight Filamentary Conductor of finite length.	6 Marks	L1	CO1	PO2
	b)	A point charge of 30nC is located at the origin while plane y=3 carries charge 10nC/m^2. Find D at (0, 4, 3).	6 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Explain Faraday's Law for Time Varying Fields.	6 Marks	L2	CO2	PO1
	b)	A conducting circular loop of radius 20cm lies in the z=0 plane in a magnetic field B = 10cos377t a_z mWb/m^2. Find a valid solution for induced voltage in the loop.	6 Marks	L3	CO2	PO4
		(OR)				
4.	a)	Develop the Maxwell's equation for time varying fields that relates space varying electric field and time varying magnetic field.	6 Marks	L3	CO2	PO3
	b)	Identify the magnetic boundary conditions as the conditions that H (or B) field must satisfy at the boundary between two different media.	6 Marks	L2	CO2	PO2

UNIT-III

5.	a)	A uniform plane wave propagating in a medium has $E = 2e^{-\alpha z} \sin(10^8 t - \beta z)\, a_y$ V/m. If the medium is characterized by $\varepsilon_r=1$, $\mu_r=20$, and $\sigma=3$mhos/m, interpret α, β, and H.	6 Marks	L4	CO3	PO4
	b)	Illustrate different types of polarizations with the necessary expressions.	6 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Develop the Wave Equations for Dielectric and Conducting Medium.	6 Marks	L2	CO3	PO3
	b)	Illustrate the reflection by a perfect conductor at normal incidence for parallel polarization. Formulate the expressions for fields.	6 Marks	L2	CO3	PO2

UNIT-IV

7.	a)	Write the mathematical expressions for attenuation constant (α), phase constant (β), phase velocity (v_p) and intrinsic impedance (η).	6 Marks	L1	CO4	PO1
	b)	In a lossless medium for which $\eta=60\prod$, $\mu_r=1$, and $H = -0.1 \cos(\omega t - z)\, a_x + 0.5 \sin(\omega t - z) a_y$ A/m. Interpret ε_r, ω, and E.	6 Marks	L3	CO4	PO4

(OR)

8.	a)	Develop the condition for distortion less and Minimum Attenuation.	6 Marks	L2	CO4	PO3
	b)	A lossless transmission line of length 100m has an inductance of 28 μ H and capacitance of 20 nF. Formulate the: i) Propagation velocity. ii) Phase constant at an operating frequency of 100 KHz.	6 Marks	L3	CO4	PO4

UNIT-V

9.	a)	Devise an expression for the input impedance of a loss less line. Derive Z_{SC} and Z_{OC} and sketch their variations.	6 Marks	L2	CO4	PO2
	b)	A 75Ω is terminated by a load of 120+80Ω. Design the maximum and minimum impedances on the line.	6 Marks	L4	CO4	PO3

(OR)

10.	a)	Identify the expression for the input impedance of a transmission line of length L.	6 Marks	L2	CO4	PO2
	b)	A loss less Line of 300Ω is terminated by a load of Z_R. If the VSWR at 200MHz is 4.48, and the first V_{min} is located at 6 cm from the load. Interpret the values of reflection coefficient and Z_R.	6 Marks	L3	CO4	PO4

CODE No.: 19BT30402 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC19) Supplementary Examinations July – 2022

ELETRONIC DEVICES AND CIRCUITS

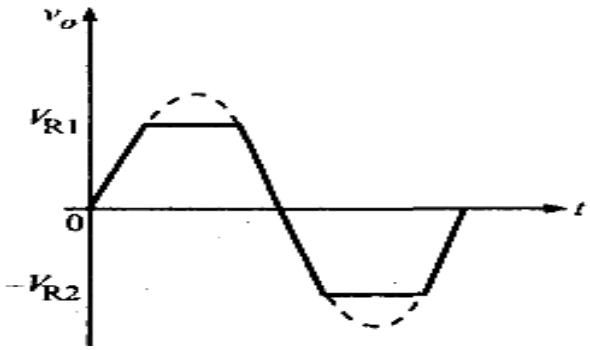
[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

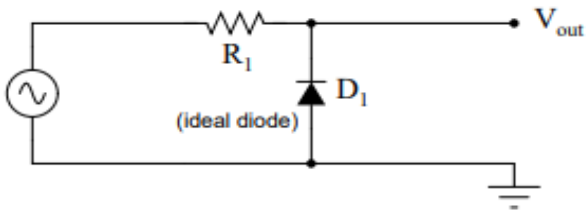
1.	a)	Develop a clipper circuit which produces the following output and assume the input applied voltage is 30VP-P, VR1 = 5V, VR2 = -5V and assume Diode is Ideal.	6 Marks	L2	CO1	PO2



	b)	Prove that a low pass circuit acts as an integrator. Derive an expression for the output voltage levels under steady state conditions of a low pass circuit excited by a ramp input.	6 Marks	L2	CO1	PO2

(OR)

2.	a)	Predict how the operation of this clipper circuit will be affected as a result of the following faults. Consider each fault independently.	6 Marks	L2	CO1	PO2



i) Diode D1 fails open
ii) Diode D1 fails shorted. For each of these conditions, explain why the resulting effects will occur.

	b)	A 10 kHz symmetrical square wave whose peak to peak amplitude is 2V is impressed upon a high pass circuit whose lower 3dB frequency is 5Hz. Calculate and sketch the output waveform in particular what is the peak to peak amplitude.	6 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Explain collector to base bias of CE amplifier with neat sketch and derive expression for S.	6 Marks	L1	CO2	PO2
	b)	Discuss the need for biasing a transistor and illustrate the DC load line analysis of BJT.	6 Marks	L2	CO2	PO1

(OR)

4.	a)	Design a base bias circuit with n-p-n transistor when the operating point is at I_C=1mA, V_{CE}=24V, β=60, $V_{CE(Sat)}$=0V, $I_{C(cut\ off)}$=0mA and V_{CC}=36V.	6 Marks	L4	CO2	PO3
	b)	Derive the expression for stability factor for voltage divider bias of a transistor circuit.	6 Marks	L2	CO2	PO2

UNIT-III

5.		Give the complete analysis of CE transistor amplifier circuit using h-parameters and derive expressions for the current gain, voltage gain, input impedance and output admittance.	12 Marks	L4	CO3	PO2

(OR)

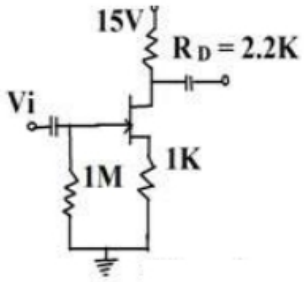
6.	a)	Analyze CB amplifier with exact and approximate analysis.	6 Marks	L4	CO3	PO2
	b)	Discuss the advantages of H-parameter analysis.	6 Marks	L1	CO3	PO1

UNIT-IV

7.		Explain the construction, operation and the characteristics of N-Channel JFET with the help of neat diagrams and also compare it with BJT.	12 Marks	L1	CO4	PO1

(OR)

8.	a)	For a common source amplifier as shown in the figure, operating point is defined by $V_{GSQ=}$ -2.5V, V_p= -6V & I_{DQ}=2.5mA with I_{DSS}=8mA. Calculate g_m, r_d ,Z_i , Z_o & Voltage gain A_v.	6 Marks	L4	CO4	PO2



	b)	With the help of neat diagram, explain the voltage divider biasing method for FET.	6 Marks	L1	CO4	PO1

UNIT-V

9.	a)	Explain the operation and characteristics of varactor diode with neat diagram.	6 Marks	L1	CO5	PO1
	b)	For a certain UJT Relaxation oscillator, the resistance is 10KΩ, the capacitance is 0.1 μF. The valley potential is 1.5V when V_{BB}=20V. Assuming diode cut-in voltage of 0.7V and standoff ratio as 0.6, calculate the frequency of oscillations.	6 Marks	L3	CO5	PO2

(OR)

10.	a)	Explain the various modes of operation of a TRIAC	6 Marks	L1	CO5	PO1
	b)	Explain the operation of the SCR using two transistor analogy.	6 Marks	L2	CO5	PO1

❀ ❀ ❀

CODE No.: 19BT30403 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC19) Supplementary Examinations July – 2022

SIGNALS AND SYSTEMS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

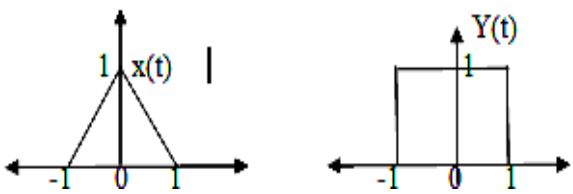
1.	a)	Discuss the importance of impulse signal as test signal for testing of various electronic equipments to ensure the safety and security of environment.	6 Marks	L2	CO1	PO2
	b)	Given a signal $x(t) = t \quad 0 < t < 2$ $= 2 \quad t > 2 \; t > 2$ $= 0 \quad$ elsewhere Plot the following signals x(2t), x(-t), x(t/2), 7x(-2t+3)	6 Marks	L3	CO1	PO2
		(OR)				
2.	a)	What is the importance of convolution? Find the response of a system for the given sequences x(n) = {1, 0, -1, 2, 1} and h(n) = {1, 2, -1, 2}	6 Marks	L1	CO1	PO1
	b)	Sketch the bounded and unbounded signals and check whether system $h(t)=e^{3t}$ is stable or not.	6 Marks	L2	CO1	PO2

UNIT-II

3.	a)	Examine the conditions required for existence of Fourier transform.	6 Marks	L1	CO2	PO1
	b)	What are the Dirichlet conditions? Derive the formulae for Fourier Coefficients.	6 Marks	L1	CO2	PO1
		(OR)				
4.	a)	Explain how input and output signals are related to impulse response of LTI system.	6 Marks	L2	CO2	PO1
	b)	Find the Fourier transform of the following: i) x(t) = A sin (2πfct) U(t) ii) x(t) = A rect(t / T) cos (2πfct)	6 Marks	L2	CO2	PO2

UNIT-III

5.	a)	A filter has an input $x(t)=e^{-2t}u(t)$ and transfer function, H(W)=1/(1+jw). Find ESD of the output.	6 Marks	L1	CO3	PO1
	b)	Find the cross correlation between unit triangular and unit gate pulse as follows:	6 Marks	L1	CO3	PO5



(OR)

6.	a)	State and prove Parseval's theorem.	6 Marks	L1	CO3	PO1
	b)	Find auto correlation, power, RMS value and sketch the PSD for the signal x(t)=(A+sin100t)cos200t.	6 Marks	L1	CO3	PO5

UNIT-IV

7.	a)	Determine x(t) and ROC for the function $X(s)=\frac{(s+1)(s+1)}{s^2-s-1}$ $\mathrm{Re}\{s\}\geq\frac{1}{2}$	6 Marks	L2	CO4	PO1
	b)	Obtain the Laplace Transform of a gate function and define ROC and with their conditions.	6 Marks	L2	CO4	PO2
		(OR)				
8.	a)	Explain how laplace transform is useful to analyse the stability of systems in s domain.	6 Marks	L2	CO4	PO2
	b)	Using convolution theorem for laplace transform find $y(t) = x_1(t)*x_2(t)$ where $x_1(t) = e^{-3t}u(t)$ and $x_2(t) = u(t-2)$.	6 Marks	L1	CO4	PO1

UNIT-V

9.	a)	List different types of noise.	6 Marks	L1	CO5	PO1
	b)	An amplifier with gain=30dB and Bandwidth=25kHz is found to have T=120K. Noise Figure =2 Find T_e and output noise power.	6 Marks	L3	CO5	PO4
		(OR)				
10.	a)	What is aliasing and anti aliasing? What are the causes to it and how it can be eliminated?	6 Marks	L2	CO5	PO2
	b)	Explain the following sampling techniques. i) Natural sampling. ii) Flat top sampling.	6 Marks	L3	CO5	PO4

CODE No.: 19BT30404 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC19) Supplementary Examinations July – 2022

SWITCHING THEORY AND LOGIC DESIGN

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Perform the subtraction with the following unsigned binary numbers by taking the 2's complement of the subtrahend. i)11010-10000 ii)11010-1101 iii)100-11000 iv)1010100-1010100	8Marks	L3	CO1	PO2
	b)	List out the binary codes in Number Systems.	4Marks	L1	CO1	PO1
		(OR)				
2.	a)	Assume that the even parity hamming code is $(0100111)_2$ is transmitted and that $(0100011)_2$ is received. The receiver does not know what is transmitted. Determine the bit location where error has occurred in the code received.	7Marks	L4	CO1	PO4
	b)	Express the complements of the following expressions i) B'C'D+(B+C+D)'+B'C'D'E ii) (ABC)'(A+B+C)'	5Marks	L2	CO1	PO3
		UNIT-II				
3.		Simplify the following function using Tabular method. F (A, B, C, D) = Σm(0, 1, 2, 3, 4, 10, 11, 12)+d (0, 3, 6, 10).	12Marks	L3	CO1	PO2
		(OR)				
4.	a)	Implement the following function with either NAND or NOR gates. **F=w'x'z+wxz+x'y'z+wxyz'**	6Marks	L3	CO1	PO3
	b)	Obtain the simplified expression in sum of products F(A, B, C, D)= Σm(1, 2, 4, 11, 12, 13)+d (0, 3, 6, 10).	6Marks	L4	CO1	PO4
		UNIT-III				
5.	a)	Draw and explain decimal adder.	6Marks	L2	CO2	PO1
	b)	Distinguish between an encoder and decoder.	6Marks	L4	CO2	PO2
		(OR)				
6.		Implement the following Boolean function using 4:1 Mux: F(A, B, C, D)=∑m(0, 1, 3, 4, 8, 9, 14) .	12Marks	L3	CO1	PO4
		UNIT-IV				
7.	a)	Convert SR Flip-Flop to D Flip-Flop	6Marks	L3	CO2	PO3
	b)	Describe race-around problem in JK Flip-flop? Explain how it is eliminated in Master slave JK Flip –Flop.	6Marks	L2	CO2	PO1
		(OR)				
8.		Design Mod-10 Counter using T Flip-Flops.	12 Marks	L3	CO2	PO6

UNIT-V

9.	a)	Write a programmable table to implement a BCD to Ex-3 code conversion using a PAL.	6 Marks	L3	CO3	PO2
	b)	Distinguish between PROM, PLA and PAL.	6 Marks	L2	CO4	PO4

(OR)

10.		A sequential circuit has one input and one output and shown in table:3: Design the sequential circuit with JK flip-flop	12 Marks	L3	CO3	PO7

Table.3

Present State		Next State		output	
		X=0	X=1	X=0	X=1
A	B	AB	AB	Y	Y
0	0	00	10	0	0
0	1	11	00	0	0
1	0	10	01	1	1
1	1	00	10	1	0

CODE No.: 19BT30501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC19) Supplementary Examinations July – 2022

COMPUTER GRAPHICS

[Computer Science and Engineering, Information Technology]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain about graphics monitors and workstations.	6 Marks	L2	CO1	PO1
	b)	Compare and Contrast DDA algorithm and Bresenham's algorithm.	6 Marks	L3	CO2	PO2
		(OR)				
2.	a)	Illustrate clearly the midpoint circle drawing algorithm.	6 Marks	L2	CO2	PO1
	b)	Given a circle radius **r** = 10, demonstrate the midpolnt circle algorithm by determining positions along the circle octant in the first quadrant upto $x = 0$ to $x = y$.	6 Marks	L3	CO2	PO3
		UNIT-II				
3.	a)	Explain the flood fill algorithm with a sample polygon.	6 Marks	L2	CO2	PO1
	b)	Find the transformation matrix that transforms the given square ABCD to half its size with centre still remaining at the same position. The coordinates of the square are A(1, 1), B(3, 1), C(3, 3), D(1, 3) and centre at (2, 2). Also find the resultant coordinates of square.	6 Marks	L3	CO3	PO2
		(OR)				
4.	a)	Illustrate clearly about translation and scaling transformations with examples.	6 Marks	L2	CO3	PO1
	b)	Apply the shearing transformation to square with A(0, 0), B(1, 0), C(1, 1), D(0, 1) as shear parameter value of 0.5 relative to the line yref = -1.	6 Marks	L3	CO3	PO2
		UNIT-III				
5.	a)	Explain clearly Window-to -viewport coordinate transformation.	6 Marks	L2	CO3	PO1
	b)	Write the cohen-sutherland line clipping algoritmm.	6 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Explain the properties of Bezier curve.	6 Marks	L2	CO3	PO1
	b)	Construct the Bezier curve of order 3 and with polygon vertices A(1, 1), B(2, 3), C(4, 3) and D(6, 4).	6 Marks	L3	CO3	PO2
		UNIT-IV				
7.	a)	Illustrate clearly about Reflection 3D Transformation with an example.	6 Marks	L3	CO3	PO2
	b)	Compute the new line points on 3D Scaling of a line A(1, 1, 1), B(2, 2, 2) with S(3, 3, 3).	6 Marks	L3	CO3	PO2
		(OR)				
8.	a)	Illustrate about perspective projection of an object to the view plane.	6 Marks	L2	CO3	PO1
	b)	Explain 3D clipping with a diagram.	6 Marks	L2	CO3	PO1
		UNIT-V				
9.	a)	Illustrate classification visible surface detection method.	6 Marks	L2	CO4	PO1
	b)	Explain Gouraud shading method.	6 Marks	L2	CO4	PO1
		(OR)				
10	a)	Differentiate between depth buffer method with scan line method.	6 Marks	L3	CO4	PO2

. b) Illustrate BSP tree visible surface detection method. 6 Marks L2 CO4 PO1

CODE No.: 19BT30502 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC19) Supplementary Examinations July – 2022

COMPUTER ORGANIZATION

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Perform the following arithmetic operations in binary using 2's complement representation. i) $(+12)_{10} + (-13)_{10}$. ii) $(-12)_{10} + (-13)_{10}$. iii) $(-6)_{10} - (+13)_{10}$	6Marks	L3	CO1	PO2
	b)	Draw flowchart and explain Booth's algorithm for multiplication of signed 2's complement numbers.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Design a 4-bit combinational circuit which performs bitwise OR, AND, XOR, NOT logical operations.	8 Marks	L4	CO3	PO3
	b)	Draw the flowchart and discuss in detail the binary subtraction of 2's complement numbers.	4 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Explain about the register and immediate addressing modes with examples.	6 Marks	L2	CO2	PO1
	b)	What is a machine instruction format? What are the generic fields in a machine instruction format?	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Design the common bus system that connects all the basic computer registers and memory. Analyze how the data is transferred.	8 Marks	L4	CO3	PO3
	b)	Draw and explain the flowchart for basic instruction cycle.	4 Marks	L2	CO2	PO1

UNIT-III

5.	a)	Differentiate between Isolated I/O and Memory Mapped I/O techniques.	6 Marks	L2	CO2	PO2
	b)	A DMA module is transferring characters to main memory from an external device transmitting at 9600 bits per second (bps).The processor can fetch instructions at the rate of 1 MIPS. By how much will the processor be slowed down due to the DMA activity?	6 Marks	L3	CO4	PO1
		(OR)				

6.	a)	Define the following: i) Micro Operation. ii) Control Word. iii) Control memory. iv) Micro Program. v) Micro Instruction.	6 Marks	L2	CO2	PO1
	b)	What is the purpose of I/O interface? Explain various commands issued to I/O interface.	6 Marks	L2	CO2	PO1

UNIT-IV

7.	a)	Design a 4M x 1 memory system using 1M x 1 RAM chips.	6 Marks	L4	CO3	PO3
	b)	Discuss in detail the nonvolatile solid-state memory technologies.	6 Marks	L2	CO4	PO1

(OR)

8.	a)	Explain fully associative cache mapping technique with a neat sketch.	6 Marks	L3	CO2	PO1
	b)	How many 128 x 8 RAM chips are needed to provide a memory capacity of 2048 bytes? And how many lines of the address bus must be used to access 2048 bytes of memory? How many of these lines will be common to all chips? How many lines must be decoded for the line select?	6 Marks	L3	CO2	PO2

UNIT-V

9.	a)	Compare the SIMD array processors and attached array processors.	6 Marks	L3	CO2	PO2
	b)	What are the different types of pipeline conflicts? Discuss in detail the resource conflicts and possible solutions.	6 Marks	L3	CO2	PO1

(OR)

10.	a)	How does vector processors provide advantage over scalar processors? How does vectorizing benefit matrix multiplication?	6 Marks	L3	CO4	PO1
	b)	Discuss in detail the Flynn's Classification of computers.	6 Marks	L2	CO2	PO1

CODE No.: 19BT30503 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC19) Supplementary Examinations July – 2022

DATA STRUCTURES

[Computer Science and Engineering, Information Technology]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	List the applications of linked list.	4 Marks	L1	CO1	PO1
	b)	Explain circular linked list operations in detail.	8 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Define header node/start node in a list with an example.	4 Marks	L1	CO1	PO1
	b)	Write the implementation of addition of two polynomials.	8 Marks	L3	CO1	PO3
		UNIT-II				
3.	a)	Write a program to implement stack operations Using arrays.	6 Marks	L3	CO1	PO3
	b)	Evaluate the given postfix expression 623+-382/+*2$3+.	6 Marks	L2	CO1	PO2
		(OR)				
4.	a)	Write a program to implement queue operations Using arrays.	6 Marks	L3	CO1	PO3
	b)	Illustrate how to convert an infix expression to postfix expression using stack with an example.	6 Marks	L2	CO1	PO2
		UNIT-III				
5.	a)	Define red-black tree and its properties.	4 Marks	L1	CO2	PO1
	b)	Explain algorithms for binary tree traversals.	8 Marks	L3	CO2	PO2
		(OR)				
6.	a)	Give an algorithm for finding minimum element in binary search tree.	4 Marks	L2	CO2	PO2
	b)	Construct AVL tree by inserting the following data sequentially. 45, 32, 70, 67, 21, 85, 92, 40 and explain steps involved in detail.	8 Marks	L3	CO2	PO2
		UNIT-IV				
7.		Define sorting and illustrate any two internal sorting algorithms in detail.	12 Marks	L2	CO4	PO1
		(OR)				
8.	a)	Explain Java code for binary search with an example.	8 Marks	L2	CO3	PO2
	b)	Discuss about divide and conquer approach.	4 Marks	L1	CO3	PO1
		UNIT-V				
9.	a)	Explain in detail different ways of representing graphs.	6 Marks	L2	CO2	PO2
	b)	How do you pick a good hash function?	6 Marks	L2	CO2	PO2
		(OR)				
10.	a)	Define Minimum Spanning Tree (MST) and how we can get MST from the given graph.	6 Marks	L2	CO2	PO2
	b)	How do we deal with collisions?	6 Marks	L1	CO2	PO1

CODE No.: 19BT31201 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC19) Supplementary Examinations July – 2022

DISCRETE MATHEMATIC STRUCTURES
[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Utilize truth table, verify that the proposition $(P \wedge Q) \wedge \neg (P \vee Q)$ is a contradiction.	6 Marks	L3	CO1	PO1
	b)	Show that the following premises are inconsistent: i) If Jack misses many classes through illness, then he fails high school. ii) If Jack fails high school, then he is uneducated. iii) If Jack reads a lot of books then he is not uneducated. iv) Jack misses many classes through illness and reads a lot of book.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Examine whether the conclusion C follows logically from the premises H_1 and H_2. i) $H_1: P \rightarrow Q$, $H_2 \neg (P \wedge Q)$, C: $\neg P$. ii) $H_1: \neg P$, $H_2: P \leftrightarrow Q$, C: $\neg (P \wedge Q)$. iii) $H_1: P \rightarrow Q$, $H_2: \neg P$, C:Q. iv) $H_1: \neg Q$, $H_2: P \rightarrow Q$. C: $\neg P$.	6 Marks	L4	CO1	PO2
	b)	Discuss in detail about Automatic Theorem and show that (S V R) is tautologically implied by $(P \vee Q) \wedge (P \rightarrow R) \wedge (Q \rightarrow S)$.	6 Marks	L6	CO1	PO2

UNIT-II

3.	a)	Identify which elements have complements and which do not have complements if 45 *D* denotes the set of all divisors of 45, under divisibility ordering.	6 Marks	L3	CO2	PO2
	b)	Show that $(X, \leq)$ is a chain , where $X = \{1, 2, 3, 4, 6, 12\}$ and $\leq$ is the usual less than or equal to relation.	6 Marks	L1	CO2	PO2
		(OR)				
4.	a)	Analyze Compatibility Relation with an Example.	6 Marks	L4	CO2	PO2
	b)	Find the Maximum Compatibility Block in the Given Relation. X= {(ball, bed, dog, let, egg)} and the relation is given as R= {(x, y) / x, y $\in$ X $\wedge$ x R y if x and y Contains some common Letter.	6 Marks	L1	CO2	PO2

UNIT-III

5.	a)	Discuss the properties of transitive closure of a binary relation.	6 Marks	L6	CO3	PO1
	b)	Show that $(xy)^{-1} = y^{-1}x^{-1}$, where x and y are elements of group G.	6 Marks	L1	CO3	PO2
		(OR)				

6.	a)	Illustrate groups with examples.	6 Marks	L2	CO3	PO1
	b)	List properties of binary relations with examples.	6 Marks	L1	CO3	PO1
		UNIT-IV				
7.	a)	Discuss multinomial theorem in detail.	6 Marks	L6	CO4	PO1
	b)	Solve the recurrence relation $a_n = 6a_{n-1} - 9a_{n-2}$ with initial conditions $a_0 = 4$ and $a_1 = 6$.	6 Marks	L6	CO4	PO2
		(OR)				
8.	a)	How many ways can 3 novels and 2 biographies can be arranged in a shell if There are 5 novels and 4 biographies?	6 Marks	L1	CO4	PO2
	b)	Solve the recurrence relation $a_n = 3a_{n-1} + 2^n$ with initial condition $a_0 = 2$.	6 Marks	L6	CO4	PO2
		UNIT-V				
9.	a)	Show that if a plane graph is self-dual, then E = 2 V – 2.	6 Marks	L1	CO5	PO3
	b)	Discuss graph coloring problem with required examples.	6 Marks	L6	CO5	PO1
		(OR)				
10.	a)	Analyze the bipartite graph with suitable examples.	6 Marks	L4	CO5	PO2
	b)	Explain BFS with an example.	6 Marks	L1	CO5	PO1

CODE No.: 19BT31502 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC19) Supplementary Examinations July – 2022

OPERATING SYSTEMS

[Computer Science and Engineering, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What are the services provided by Operating Systems?	4 Marks	L2	CO1	PO1
	b)	Write short notes on: i) Multilevel Queue Scheduling. ii) Multilevel Feedback Queue Scheduling.	8 Marks	L2	CO1	PO2
		(OR)				
2.	a)	What is Inter process Communication? Explain the issues related to logical implementation of communication in message passing systems.	7 Marks	L2	CO1	PO2
	b)	Classify different multithreading models.	5 Marks	L2	CO1	PO2

UNIT-II

3.	a)	Using semaphores, explain how mutual exclusion is achieved for the producer and consumer processes in Bounded Buffer Problem.	7 Marks	L4	CO2	PO5
	b)	Give the syntax and specify the need of monitors. Discuss the ways of resuming a process in a monitor.	5 Marks	L2	CO2	PO2
		(OR)				
4.	a)	With illustrations, explain the way of deadlock detection in a system having several instances of a resource type.	6 Marks	L2	CO3	PO2
	b)	Write short notes on: i) Resource Allocation graph. ii) Issues that arise by Resource pre-emption in Deadlock Recovery.	6 Marks	L2	CO3	PO2

UNIT-III

5.	a)	Give the detailed description about the hardware implementation of a page table with translation Look-Aside Buffer.	5 Marks	L2	CO4	PO2
	b)	Consider the following page reference string: 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6 How many page faults would occur for the optimal page replacement algorithm, assuming three frames and all frames are initially empty.	7 Marks	L3	CO4	PO3
		(OR)				
6.		Consider a swapping system in which memory consists of the following hole sizes in memory order: 12 KB, 4 KB, 24 KB, 15 KB, 9 KB, 7 KB, 10 KB and 11 KB. Determine which hole is taken for successive segment requests of: i) 14 KB ii) 8 KB iii) 5 KB for first fit, best fit, and worst fit approaches.	12 Marks	L3	CO4	PO3

UNIT-IV

7.	a)	Discuss about the linear list and hash table data structures to implement a directory.	6 Marks	L2	CO5	PO2
	b)	Write in detail about file attributes, operations, types and structures.	6 Marks	L2	CO5	PO1
		(OR)				
8.	a)	Illustrate the three allocation methods in file system implementation with proper diagrams.	6 Marks	L2	CO5	PO2
	b)	Explain the data structures supported by kernel I/O subsystem.	6 Marks	L2	CO6	PO2

UNIT-V

9.	a)	What is access matrix? Justify how the access matrix can be implemented effectively.	7 Marks	L4	CO6	PO4
	b)	Discuss the goals and principles of protection in a modern computer system.	5 Marks	L1	CO6	PO1
		(OR)				
10.	a)	Analyze why simple password protection is the most common authentication scheme in use today and discuss the weakness inherent in the password protection scheme.	6 Marks	L4	CO6	PO4
	b)	Explain the terms ‘WORMS’ and ‘VIRUSES’ with reference to system threats.	6 Marks	L2	CO6	PO2

CODE No.: 20BT3BS01 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Regular Examinations March – 2022

NUMERICAL METHODS, PROBABILITY AND STATISTICS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Science), Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Using the method of Regula Falsi, find an appropriate root for the equation $x^3 - 4x + 1 = 0$ correct up to 2 decimal places. — 7 Marks L3 CO1 PO1

   b) Find the root of the equation by Newton Raphson's method. $\mathbf{f(x) = x^3 - 3x - 5 = 0}$ correct up to 2 decimal places. — 7 Marks L3 CO1 PO1

(OR)

2. a) Find the solution using Newton's Forward Difference formula and estimate the value of x = 1895. — 7 Marks L1 CO1 PO1

X	1891	1901	1911	1921	1931
f(x)	46	66	81	93	101

   b) Find the solution using Lagrange's interpolation and estimate the value of x = 2.7. — 7 Marks L1 CO1 PO1

x	2.0	2.5	3.0
f(x)	0.69315	0.91629	1.09861

UNIT-II

3. a) Compute $f'(x)$ *and* $f''(x)$ at x = 23 by using Newton backward numerical differentiation formula from the following table. — 7 Marks L1 CO2 PO1

X	14	16	18	20	22	24
f(x) = $\sqrt{x}$	3.746	4.000	4.243	4.472	4.690	4.899

   b) Evaluate $\int_0^1 \sqrt{1+x^3}\,dx$ taking h = 0.10 by using Simpshon's 1/3 and 3/8 method. — 7 Marks L1 CO2 PO1

(OR)

4. a) Solve $y' = y^2 + x, y(0) = 1$ using Taylor's series method compute y(0.2) taking h=0.2 correct to 4 decimal places. — 7 Marks L2 CO2 PO2

   b) Apply R-K method to solve $y' = x + y, y(0) = 1, h = 0.2.$ and find y(0.2). — 7 Marks L2 CO2 PO2

UNIT-III

5. a) If a discrete random variable x has the following probability function, find the value of i) k; ii) E(x) and iii) Var(x). — 7 Marks L1 CO3 PO1

x	3	2	1	0	-1	-2	-3
P(x)	0.1	0.2	3k	k	2k	0	0.1

   b) The time to failure in thousands of hours of an important piece of electronic equipment used in a manufactured DVD player has the density function. $f(x) = \begin{cases} 2.e^{-2x}; & x > 0 \\ 0; & otherwise \end{cases}$ Find E(X) and Var(X). — 7 Marks L1 CO3 PO1

(OR)

6.	a)	Two cards are drawn successively with replacement from a well shuffled pack of 52 cards. Find the expected value for the number of aces.	7 Marks	L1	CO3	PO1
	b)	If X and Y are independent random variables, then show that $V(X + Y) = V(X) + V(Y)$.	7 Marks	L1	CO3	PO1

UNIT-IV

7.	a)	The mean and variance of binomial variate x with parameters 'n' and 'p' are 16 and 8. Find: i) $P(x=4)$ ii) $P(x\geq 3)$.	7 Marks	L2	CO4	PO2
	b)	The number of incidents at a nuclear power plant has a Poisson distribution with a mean of 4 incidents per year in one year. Find the probability that there will be i) no more than 2 incidents ii) exactly 6 incidents in a one year period.	7 Marks	L2	CO4	PO2

(OR)

8.	a)	Body Mass Index (BMI) in a population of 60 year old men in whom BMI is normally distributed and has a mean value is 29 and a standard deviation is 6. Find the probability that BMI is i) more than 28, ii) in between 29.5 to 32.4, iii) less than 30.	7 Marks	L2	CO4	PO2
	b)	Customers experiencing technical difficulty with their internet cable hookup may call for technical support. It takes the technician between 90 seconds and 14 minutes to resolve the problem. The distribution of this support time follows the uniform distribution. i) What are the values for **a** and **b** in minutes? ii) What is the mean time to resolve the problem? iii) What percent of the problems take more than 5 minutes to resolve?	7 Marks	L2	CO4	PO2

UNIT-V

9.	a)	10 specimens of copper wires drawn from a large lot have the following breaking strength: 578, 572, 570, 568, 572, 571, 570, 572, 596, and 548. Test whether the mean breaking strength of the lot may be taken be 578kg. Assume 0.05 level.	7 Marks	L3	CO5	PO3
	b)	An investigation of relative merits of two kinds of flash lights batteries showed that a random sample of 100 batteries of brand A tested on the average 36.5 hrs with a S.D of 1.8 hrs while a random sample of 80 batteries of brand B tested on the average 36.8 hrs with a S.D of 1.5 hrs. Test the claim at 5% level.	7 Marks	L3	CO5	PO3

(OR)

10.	a)	In a sample of 600 students of a certain college 400 are found to use dot pens. In another college, from a sample of 900 students 450 were found to use dot pens. Test whether the two colleges are significantly different with respect to the habit of using dot pens.	7 Marks	L4	CO5	PO3
	b)	A large electronics firm that hires many workers with disabilities wants to determine whether their disabilities affect such workers performance. Use the 0.05 level of significance to decide on the basis of the sample data shown in the following table whether it is reasonable to maintain that the disabilities have no effect on the workers performance.	7 Marks	L4	CO5	PO3

	performance		
	Low	Average	high
Deaf	16	49	24
disability	29	93	28

CODE No.: 20BT3BS02 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Regular Examinations March – 2022

SPECIAL FUNCTIONS AND COMPLEX ANALYSIS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks:70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define Beta function and applying it show that $\frac{\beta(m+1,n)}{m}=\frac{\beta(m,n+1)}{n}=\frac{\beta(m,n)}{m+n}$.	7 Marks	L1	CO1	PO1
	b)	Prove that 1.3.5.7 ……..(2n -1) $\sqrt{\pi}=2^n\Gamma(n+\frac{1}{2})$.	7 Marks	L5	CO1	PO1
		(OR)				
2.	a)	Prove that $\int_0^1 \frac{x^2}{\sqrt{1-x^4}}dx \times \int_0^1 \frac{dx}{\sqrt{1+x^4}}=\frac{\pi}{4\sqrt{2}}$.	7 Marks	L5	CO1	PO1
	b)	Show that $\beta\left(m,\frac{1}{2}\right)=2^{2m-1}\beta(m,m)$.	7 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Prove that $J_{-\frac{1}{2}}(x)=\sqrt{\frac{2}{\pi x}}\cos x$.	7 Marks	L5	CO2	PO2
	b)	Demonstrate $f(x)=x^4+3x^3-x^2+5x-2$ in terms of Legendre polynomials.	7 Marks	L2	CO2	PO2
		(OR)				
4.	a)	Demonstrate $J_5(x)$ in terms of $J_0(x)$ and $J_1(x)$.	7 Marks	L2	CO2	PO2
	b)	Prove the recurrence relation $(n+1)P_{n+1}(x)=(2n+1)xP_n(x)-nP_{n-1}(x)$.	7 Marks	L5	CO2	PO2

UNIT-III

5.	a)	Define analytic function and show that the function $f(z)=\sqrt{\lvert xy\rvert}$ is not analytic at the origin even though Cauchy Riemann equations are satisfied thereof.	7 Marks	L1	CO3	PO2
	b)	Construct the bilinear transformation which maps the points 1, *i*, -1 to 2, *i*, -2.	7 Marks	L3	CO4	PO2
		(OR)				
6.	a)	Construct an analytic function whose real part is $e^x\left[(x^2-y^2)\cos y-2xy\sin y\right]$.	7 Marks	L3	CO3	PO2
	b)	Discuss the transformation $w=e^z$.	7 Marks	L5	CO4	PO2

UNIT-IV

7.	a)	Evaluate $\int_C \frac{\sin^2 z}{(z-\pi/6)^3} dz$ where C is the circle $\lvert z\rvert = 1$.	7 Marks	L4	CO5	PO2
	b)	Expand $f(z) = \frac{1}{(z-1)(z-2)}$ in the region (i) $\lvert z\rvert < 1$, (ii) $1 < \lvert z\rvert < 2$ (iii) $0 < \lvert z-1\rvert < 1$.	7 Marks	L2	CO5	PO1
		(OR)				
8.		State Cauchy's theorem and verify it for e^{iz} along the boundary of the triangle with the vertices of the point 1+*i*, -1+*i* and -1-*i*.	14 Marks	L1	CO5	PO2

UNIT-V

9.	a)	Define pole and residue. Find the poles and corresponding residues of $f(z) = \frac{\sin z}{z\cos z}$.	7 Marks	L1	CO5	PO1
	b)	Evaluate $\int_C \tan z\, dz$ where C is the circle $\lvert z\rvert = 2$ By applying theory of residues.	7 Marks	L5	CO5	PO2
		(OR)				
10.		Show that $\int_0^\infty \frac{dx}{x^6+1} = \frac{\pi}{3}$ by complex variable technique.	14 Marks	L2	CO5	PO5

CODE No.: 20BT12901 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Regular Examinations March – 2022

DISCRETE MATHEMATICAL STRUCTURES

[Computer Science and Engineering, Information Technology, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Science)]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Determine the following premises is valid or invalid : ~ r → (s→ ~t) ~ r v w ~ p →s w _____ t → p	7 Marks	L4	CO1	PO1
	b)	Check the following argument inconsistency or consistency using rules of inference. Every living thing is a Plant or animal. Ratna's dog is alive and it is not a plant. All animals have hearts. Hence, Ratna's dog has a heart.	7 Marks	L4	CO1	PO2
		(OR)				
2.	a)	Prove the following one tautology or not: $\sim(p \vee q) \vee [(\sim p) \wedge q] \vee p$ (Using truth table).	7 Marks	L3	CO1	PO6
	b)	Give a contradiction proof that the square root of 2 is not a rational.	7 Marks	L3	CO1	PO1

UNIT-II

3.	a)	Define POSET. Draw a POSET or Hasse diagram for the POSET $[D_{12};/]$ and determine all maximal and minimal elements and greatest and least elements if they exist. Specify the $[D_{12};/]$ POSET is lattice or not.	7 Marks	L4	CO2	PO1
	b)	Let R be the relation in the natural numbers N = {1,2,3..} defined by "x + 2y = 10", that is, let R = {(x,y)|x∈N, x+2y = 10}. Find. i) The domain and range of R. ii) R^{-1} .	7 Marks	L4	CO2	PO8
		(OR)				
4.	a)	If f:A→B and g:B→C are both one-to-one correspondences, prove that gof is also a one-to-one correspondence.	7 Marks	L3	CO2	PO1
	b)	If $f(x)= x^3+1$ and f(x) is a bijective function find the inverse of the function.	7 Marks	L3	CO2	PO6

UNIT-III

5.	a)	Discuss the Homomorphism with suitable examples.	7 Marks	L2	CO3	PO1
	b)	Show that every cyclic graph is abelian group.	7 Marks	L2	CO3	PO1
		(OR)				
6.	a)	A = {2,4,8}. Determine that $(A,+_6)$ is a subgroup of $(Z_6, +_6)$.	7 Marks	L3	CO3	PO6
	b)	Explain Algebraic system general properties with suitable examples.	7 Marks	L2	CO3	PO2

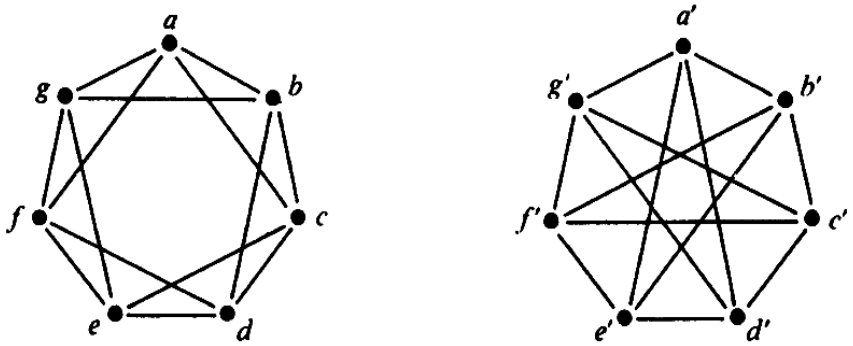
UNIT-IV

7.	a)	Prove by using Mathematical Induction, for each integer n > 1, n^{th} Fibonacci number F_n is less than $(7/4)^n$.	7 Marks	L4	CO4	PO8
	b)	How many different license plates are there (allowing repetitions) : that involve 1, 2, or 3 letters followed by 1, 2, 3, or 4 digits?	7 Marks	L3	CO4	PO6
		(OR)				
8.	a)	Solve the following recurrence relations: $\mathbf{a_n-7a_{n-1}+ 16a_{n-2}-12a_{n-3}=0}$ where $\mathbf{a_0=1, a_1=4, a_2=8}$ (using generating functions method).	7 Marks	L4	CO4	PO1
	b)	Find the coefficient of X^{25} in $\mathbf{(X^2+X^3+X^4+X^5+X^6)^7}$.	7 Marks	L4	CO4	PO2

UNIT-V

9.	a)	Find the Chromatic – Number for the i) $K_{3,3}$ ii) $K_{4,4}$ iii) $K_{n,n}$?	7 Marks	L3	CO5	PO1
	b)	Show that A complete graph K_n is planar iff $n \leq 4$. (Using Euler's)	7 Marks	L4	CO5	PO8
		(OR)				
10.	a)	What is meant by Isomorphism? Determine whether the following graphs G1 and G2 Isomorphic or not.	7 Marks	L3	CO5	PO6

(G1) **(G2)**



	b)	Discuss Prim's spanning tree algorithm with suitable examples.	7 Marks	L2	CO5	PO2

CODE No.: 20BT22901 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Regular Examinations March – 2022

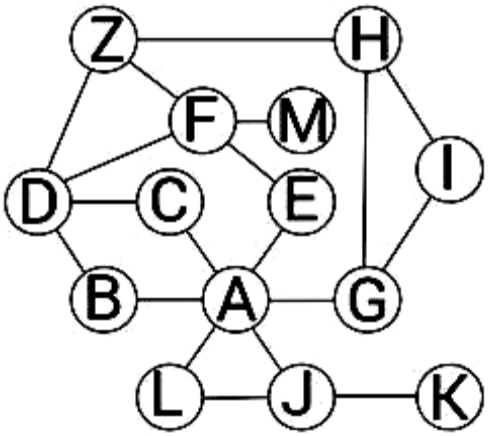
DATA STRUCTURES AND ALGORITHMS

[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	How to measure the performance analysis of an Algorithm?	7 Marks	L2	CO1	PO2
	b)	What are the guidelines for asymptotic Analysis?	7 Marks	L2	CO2	PO2
		(OR)				
2.	a)	Sort the following list of elements using Selection sort 15, 28, 46, 10, 35, 54, 5, 17	7 Marks	L3	CO2	PO5
	b)	Explain the Shell sort with an example.	7 Marks	L3	CO2	PO2
		UNIT-II				
3.	a)	What are the applications of linked list?	7 Marks	L2	CO3	PO2
	b)	What is doubly linked list? Write an algorithm to traverse doubly linked list.	7 Marks	L2	CO3	PO2
		(OR)				
4.	a)	What is circular linked list? Explain the various operations in a circular linked list.	7 Marks	L3	CO3	PO3
	b)	Write an algorithm to insert and delete an element at random place in single linked list.	7 Marks	L3	CO3	PO2
		UNIT-III				
5.	a)	Write an algorithm or program to implement Stack using linked list.	7 Marks	L2	CO4	PO2
	b)	What are the applications of Stacks?	7 Marks	L2	CO4	PO2
		(OR)				
6.	a)	Illustrate applications of Queues and write an algorithm or program to implement Queue using linked list.	7 Marks	L2	CO4	PO2
	b)	Convert the following infix expression to postfix expression using stack a+b*c+(d*e+f)*g.	7 Marks	L3	CO4	PO2
		UNIT-IV				
7.	a)	What is Complete binary tree? Write and explain all properties of complete binary trees with suitable examples.	7 Marks	L3	CO5	PO5
	b)	Construct Complete binary tree by inserting following elements 12, 6, 7, 22, 9, 14, 8, 65 and then delete elements 6 and 14.	7 Marks	L2	CO5	PO1
		(OR)				
8.	a)	Construct Binary search trees by inserting the following elements 33, 6, 7, 4, 12, 7, 9, 3, 55, 2, 46 and then delete 55 and 33.	7 Marks	L3	CO5	PO6
	b)	Write an algorithm or program to traverse Binary tree using In-order traversal technique.	7 Marks	L2	CO5	PO2
		UNIT-V				
9.	a)	Why hashing is so powerful compared to other techniques? Explain static hashing with suitable example.	7 Marks	L2	CO5	PO2
	b)	What is the motivation for Dynamic Hashing? Explain Dynamic hashing with suitable example.	7 Marks	L3	CO5	PO2
		(OR)				

10.	Find the depth first traversal and breadth first traversal for the following graph. Assume the source vertex is Z and also write the algorithm of both. 	14 Marks	L3	CO6	PO2

CODE No.: 20BT30101 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Regular Examinations March – 2022

CONSTRUCTION, PLANNING AND PROJECT MANAGEMENT

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Compare English bonds and Flemish bonds.	7 Marks	L4	CO1	PO1 PO5 PO10
	b)	Explain any three types of foundation with sketches.	7 Marks	L2	CO1	PO1 PO2 PO5
		(OR)				
2.	a)	Draw the Queen post truss and mention the parts.	8 Marks	L3	CO1	PO1 PO3 PO5
	b)	Explain any two flooring types.	6 Marks	L2	CO1	PO1 PO2 PO5
		UNIT-II				
3.	a)	Define damp proofing and describe the importance of damp proofing in construction.	8 Marks	L1	CO2	PO1 PO5 PO12
	b)	Briefly explain the constituents of paint.	6 Marks	L2	CO2	PO1 PO5 PO12
		(OR)				
4.	a)	Write short notes on: i) Shoring. ii) Scaffolding. iii) Form work. v) Varnish.	8 Marks	L2	CO2	PO1 PO5 PO10
	b)	Explain horizontal and vertical shoring with neat sketches.	6 Marks	L2	CO2	PO1 PO5 PO10
		UNIT-III				
5.	a)	Discuss about the necessary precautions need to be followed for safety in the construction site.	7 Marks	L2	CO3	PO1 PO5 PO9 PO11
	b)	Discuss about the types, merits and demerits of different types of organization.	7 Marks	L2	CO3	PO1 PO7 PO9 PO11
		(OR)				
6.	a)	Enumerate factors affecting cost owning and operating the equipment.	7 Marks	L2	CO3	PO1 PO5 PO8
	b)	Write down the steps involved in the ABC classification of materials for better resource management.	7 Marks	L1	CO3	PO1 PO2 PO6 PO11

UNIT-IV

7.	a)	Explain why planning is necessary in project management. Describe various steps in it.	7 Marks	L2	CO4	PO1 PO2 PO5 PO11
	b)	What is decision making? And explain its role in project management.	7 Marks	L2	CO4	PO1 PO2 PO3 PO9 PO11

(OR)

8.	a)	What is dummy activity? And discuss various rules for providing dummies in a network.	6 Marks	L2	CO4	PO1 PO2 PO3 PO11
	b)	A project consists of 8 activities A, B, C, D, E, F, G and H with their times of completion as follows:	8 Marks	L6	CO4	PO1 PO2 PO3 PO4

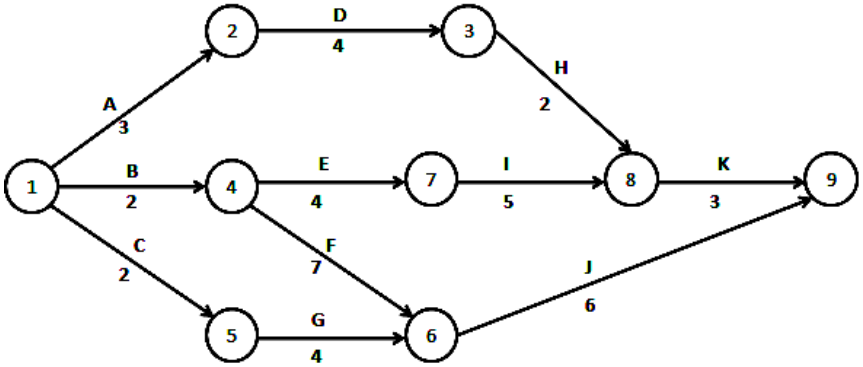
Activity	A	B	C	D	E	F	G	H
Duration (weeks)	2	4	2	4	6	4	5	4

The precedence relationships are as follows:
A and B can be performed in parallel, C and D cannot start until A is complete, E cannot start until half the work of activity C is complete., F can start only after activity D is complete, G succeeds C, H is the last activity which should succeed E.

i) Draw bar chart.
ii) What is the total time of completion of the project?

UNIT-V

9.		For a given network, calculate. i) Earliest and latest activity time for each activity. ii) Total float, free float, independent float and interfering float. iii) Determine critical path.	14 Marks	L6	CO5	PO1 PO2 PO3 PO4 PO5 PO11



(OR)

10.	a)	What is resource leveling? Illustrate with an example.	7 Marks	L2	CO5	PO1 PO2 PO4 PO10 PO11
	b)	Distinguish between crashing for optimum cost and crashing for optimum resources.	7 Marks	L4	CO5	PO1 PO2 PO10 PO11

❀ ❀ ❀

CODE No.: 20BT30102 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Regular Examinations March – 2022

FLUID MECHANICS AND HYDRAULIC MACHINERY

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain Newton's law of Viscosity and differentiate dynamic viscosity from kinematic viscosity.	7 Marks	L3	CO1	PO1 PO2
	b)	Pipes A and B are carrying water at a pressures of 100kN/m^2 and 200kN/m^2 respectively. Pipe B is located 2m above pipe A. Find the deflection of mercury in mercury U-tube differential manometer when both the limbs are connected to both the pipes.	7 Marks	L3	CO1	PO1 PO2 PO4 PO10
		(OR)				
2.	a)	Define density, specific gravity, viscosity and vapour pressure. Calculate the specific weight, specific mass, specific volume and specific gravity of a liquid having a volume of 6m^3 and weight of 44kN.	7 Marks	L2	CO1	PO1 PO2
	b)	Describe Newton's law of viscosity and a plate 0.05 mm distant from a fixed plate moves at 1.2 m/s and requires a force of 2.2 N/m^2 to maintain this speed. Find the viscosity of the fluid between the plates.	7 Marks	L3	CO1	PO1 PO2 PO4 PO10
		UNIT-II				
3.	a)	Explain the description of fluid motion and list out types of fluid flows with an example.	8 Marks	L2	CO2	PO1
	b)	Describe types of flow lines and velocity for a two dimensional flow field is given by V = (3 + 2xy +4t^2) i + (xy^2 + 3t) j. Find the velocity and acceleration at a point (1, 2) after 2 sec.	6 Marks	L2	CO2	PO1 PO2 PO4
		(OR)				
4.	a)	Derive the discharge equation of a triangular notch.	6 Marks	L2	CO2	PO1 PO2 PO4 PO10
	b)	200 lit/s of water is flowing in a pipe having a diameter of 300mm. If the pipe is bent by 600, find the magnitude and direction of the resultant force on the bend. The pressure of the water flowing is 400kN/m^2. Take specific weight of water as 9.81kN/m^3.	8 Marks	L3	CO2	PO1 PO2 PO3 PO4 PO10
		UNIT-III				
5.	a)	Two reservoirs are connected by two pipes of same length laid in parallel. The diameters of the pipes are 100mm and 300mm respectively. If the discharge through 100mm diameter pipe is 0.01m^3/s, what will be the discharge through 300mm pipe? Assume that friction factor is same for both pipes.	8 Marks	L4	CO3	PO1 PO2 PO3 PO4 PO10
	b)	In a pipe of Length 75m is flowing at a velocity of 2.8m/s. Design the diameter of the pipe using Darcy Weisbach formula. Consider the head loss in the pipe =3m, coefficient of friction = 0.004.	6 Marks	L2	CO3	PO1 PO2 PO3 PO4 PO5

(OR)

6.	a)	An oil of viscosity 9 poise and specific gravity 0.9 is flowing through a horizontal pipe of 60 mm diameter. If the pressure drop in 100 m length of the pipe is 1800 kN/m^2, determine rate of flow of oil, centre line velocity, total frictional drag over 100 m length and power required to maintain the flow.	7 Marks	L4	CO3	PO1 PO2 PO4 PO10
	b)	Define Couette flow and describe flow of viscous fluid between two parallel plates.	7 Marks	L2	CO4	PO1 PO2 PO10

UNIT-IV

7.	a)	List out types of channels and compare open channel flow and pipe flow. What is the purpose of providing bed slope in open channels?	7 Marks	L2	CO5	PO1 PO2 PO10
	b)	Classify flows and define energy and momentum correction factors. Hydraulic jump forms at the downstream end of spillway causing 18 cumec discharges. If the depth before jump is 0.8 m, determine the depth after the jump and energy loss.	7 Marks	L2	CO5	PO1 PO2 PO10

(OR)

8.	a)	Prove that for a trapezoidal channel of most economical section: i) Half of the top width = one of the length of side slopes. ii) Hydraulic mean depth = half of depth of flow.	7 Marks	L2	CO5	PO1 PO2 PO5
	b)	Find the pre-jump depth in a rectangular channel of bed width 5m when the rate of water is 10m^3/s having Froude Number after the jump is 0.8. Also find i) Loss of energy ii) % loss of energy.	7 Marks	L2	CO5	PO1 PO2 PO5

UNIT-V

9.	a)	State Impulse Momentum principle. Derive an expression for impact of jet of liquid on a fixed vertical plate. Find the force exerted by a 4cm diameter water jet directed against a flat plate held normal to the jet, if the jet is discharging 60 litres of water per second.	7 Marks	L3	CO6	PO1 PO2 PO5
	b)	Derive an expression for impact of jet of liquid on an inclined plate moving in the direction of the jet of liquid. A jet of water 120mm in diameter and moving with a velocity of 25 m/s strikes normally on a flat plate. Determine the force exerted on the plate and the work done when the plate is stationary, the plate is moving with a velocity of 8 m/s in the direction of the jet, and the plate is moving with a velocity of 8 m/s towards the jet.	7 Marks	L4	CO6	PO1 PO2 PO3 PO4 PO10

(OR)

10.	a)	Derive an expression for impact of jet on a fixed curved plate. A jet of water 5 cm in diameter and moving with a velocity of 15 m/s impinges on a series of vanes moving with a velocity of 5 m/s. Determine force on the plates. Work done per second and Efficiency of the jet.	7 Marks	L4	CO6	PO1 PO2 PO10
	b)	Obtain an expression for force exerted by the jet of water on a inclined plane which is at rest. Prove that the maximum efficiency is 50% when a jet of liquid strikes of plates fixed to the periphery of a wheel.	7 Marks	L4	CO6	PO1 PO2 PO10

CODE No.: 20BT30103 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Regular Examinations March – 2022

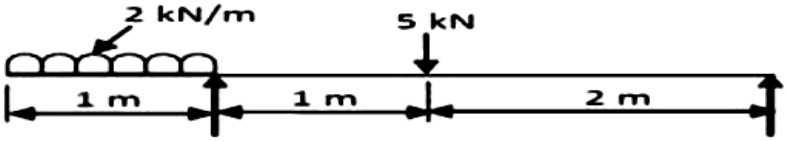
MECHANICS OF SOLIDS

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Draw the shear force and bending moment diagram for the overhanging load as shown in the figure below. And also locate the point of contra flexure. 	14 Marks	L4	CO1	PO1 PO2 PO4 PO10
		(OR)				
2.	a)	A cantilever beam of 2 m long carries a uniformly distributed load of 1.5 kN/m over a length of 1.6 m from the free end. Draws shear force and bending moment diagrams for the beam.	7 Marks	L4	CO1	PO1 PO2 PO4 PO10
	b)	A simply supported beam 6 m long is carrying a uniformly distributed load of 5 kN/m over a length of 3 m from the right end. Draw shear force and bending moment diagrams for the beam and also calculate the maximum bending moment on the beam.	7 Marks	L4	CO1	PO1 PO2 PO4 PO10
		UNIT-II				
3.	a)	State the assumptions made in deriving bending equation and derive the bending equation.	6 Marks	L4	CO2	PO1 PO2 PO3 PO4 PO6 PO10
	b)	Derive the relation between average shear stress and the maximum shear stress for a rectangular section and draw the shear distribution diagram.	8 Marks	L4	CO2	PO1 PO2 PO3 PO4 PO6 PO10
		(OR)				
4.		A square chimney 24 m high, has an opening of 1.25m x 1.25m inside. The external dimensions are 2.5m x 2.5m. The horizontal intensity of wind pressure is 1.3 kN/m^3 and the specific weight of masonry is 22 kN/m^3. Calculate the maximum and minimum stress intensities at the base of the chimney.	14 Marks	L4	CO3	PO1 PO2 PO6 PO10
		UNIT-III				
5.	a)	Derive the torsion equation for a circular shaft of dimeter ‘d’ subjected to torque ‘T’.	7 Marks	L4	CO4	PO1 PO2 PO3 PO4 PO6

	b)	Find the torque that can be transmitted by a thin tube 6 cm mean diameter and wall thickness 1 mm, the permissible stress is 6000 N/cm^2.	7 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO6
		(OR)				
6.		A close coiled helical spring is made of a round wire having 'n' turns and the mean coil radius R is 5 times the wire diameter. Show that the stiffness of the spring = 2.05 R/n. If the above spring is to support a load of 1.2 kN with 120 mm compression. Calculate mean radius of the coil and number of turns assuming G = 8200N/mm^2 and permissible shear stress, λ allowable = 250 N/mm^2.	14 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO6
		UNIT-IV				
7.		At a point in a strained material there are tensile stresses of 120 MPa and 60 MPa at right angles to one another along with a state of simple shear of 30 MPa. Draw Mohr's circle of stresses and determine the principal stresses and find the position of planes on which they act. Find also the maximum shear stress.	14 Marks	L4	CO5	PO1 PO2 PO6 PO10
		(OR)				
8.	a)	Write a short note on maximum shear stress theory.	5 Marks	L4	CO5	PO1 PO2 PO6 PO10
	b)	A certain steel has proportionality limit of 280 N/mm^2 in simple tension. Under a certain three-dimensional stress system, the principal stresses are 120 N/mm^2 tensile, 60 N/mm^2 tensile, and 30 N/mm^2 compressive. Calculate the factor of safety according to (i) maximum principal stress theory, (ii) maximum shear stress theory, (iii) total strain energy theory (iv) shear strain energy theory and (v) maximum strain theory. (1/m = 0.3).	9 Marks	L4	CO5	PO1 PO2 PO6 PO10
		UNIT-V				
9.	a)	Derive the expression for Euler's buckling load for column when one end is fixed and other is free.	7 Marks	L4	CO6	PO1 PO2 PO5 PO6
	b)	Calculate the safe compressive load on a hollow cast iron column one end rigidly fixed and other pin-jointed, 150mm outer and 100mm inner diameter, 10m long. Use Euler's formula with a factor of safety of 5 and take young's modulus as 95GN/m^2.	7 Marks	L4	CO6	PO1 PO2 PO5 PO6
		(OR)				
10.	a)	Write the limitations of the Euler's formula and give Rankine's formula for critical load on columns.	6 Marks	L4	CO6	PO1 PO2 PO5 PO6
	b)	A hollow cast iron column whose outside diameter is 200mm has a thickness of 20mm. It is 4.5m long and is fixed at both ends. Calculate the safe load by Rankine formula using a factor of safety of 4. Calculate the slenderness ratio and the ratio of Euler's and Rankine's critical load. Take σ_c = 567 MN/m^2, E = 90 GN/m^2 and a = 1/1600.	8 Marks	L4	CO6	PO1 PO2 PO5 PO6

CODE No.: 20BT30104 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Regular Examinations March – 2022

SURVEYING

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What are the principles of surveying?. Explain any two of them briefly.	8 Marks	L1	CO1	PO1 PO2
	b)	Write the different types of chains and their specifications.	6 Marks	L2	CO1	PO1 PO2 PO3 PO5

(OR)

2.	a)	If the observed bearing are as under determine the correct bearings and included angles.	8 Marks	L3	CO1	PO1 PO2 PO4

line	F.B	B.B
AB	$150^0 30'$	$329^0 45'$
BC	78^0	$256^0 30'$
CD	$42^0 30'$	$223^0 45'$
DE	$315^0 45'$	$134^0 15'$
EA	$220^0 15'$	$40^0 15'$

	b)	Differentiate between prismatic and surveyor's compass.	6 Marks	L2	CO1	PO1 PO2 PO4 PO6

UNIT-II

3.	a)	What are the methods of plane tabling? Explain any one of them in detail.	9 Marks	L2	CO1	PO1 PO2 PO6 PO10
	b)	What are the advantages and disadvantages of plane table surveying?	5 Marks	L2	CO1	PO1 PO2

(OR)

4.	a)	Define contouring. Explain the characteristics of contours.	7 Marks	L2	CO2	PO1 PO2 PO4 PO6 PO10
	b)	The following notes refer to reciprocal levels. Determine: i) The true R.L of Q. ii) The combined correction for curvature and refraction.	7 Marks	L5	CO2	PO1 PO2 PO4 PO6 PO10

Instrument at	Staff readings on		Remarks
	P	Q	
P	1.678	2.536	PQ= 1020m
Q	0.649	1.432	R.L of P =120.386

UNIT-III

5.	a)	Explain the procedure to measure a horizontal and vertical angle using Theodolite.	10 Marks	L4	CO3	PO1 PO2 PO6 PO8
	b)	Explain briefly about the temporary adjustments of theodolite.	4 Marks	L4	CO3	PO1 PO2 PO6 PO8
		(OR)				
6.	a)	The following observations were taken with a tacheometer at the station P to a staff at Q held normal to the line of sight, staff readings are 1.45, 1.915, 2.380m, angle of depression is 15^0 30'and R.L of P is 201.45m. The height of trunnion axis above the peg at P = 1.315m. Determine the horizontal distance between P and Q, and the R.L of Q. take k=100 and C=0.0	7 Marks	L5	CO3	PO1 PO2 PO5 PO6
	b)	Derive an expression for principle of stadia method.	7 Marks	L2	CO3	PO1 PO3 PO5 PO6

UNIT-IV

7.		The two tangents meet at an angle of 70^0 with a chainage of 1190.56m. The radius of curve is 300m. Take peg interval as 20m. Calculate the necessary data for the simple circular curve by using tangential angle method.	14 Marks	L6	CO5	PO1 PO2 PO5 PO6
		(OR)				
8.	a)	A railway embankment is 16m wide with side slopes 2 to 1. Assume the ground to be level in direction transverse to the centre line. Calculate the volume contained in a length of 100m, the centre height at 20m intervals being in m: 2.0, 4.5, 4.0, 3.5, 2.5, 1.5, use trapezoidal rule and Simpsons rule.	8 Marks	L5	CO4	PO1 PO2 PO4 PO5 PO6
	b)	What do you mean by degree of curve and establish the relation between radius and degree of curve?	6 Marks	L4	CO5	PO1 PO2 PO3 PO5

UNIT-V

9.	a)	What is total station? Illustrates its uses.	7 Marks	L1	CO6	PO1 PO2 PO3 PO5
	b)	What is meant by GPS? Write the applications of GPS.	7 Marks	L1	CO6	PO1 PO2 PO5 PO6
		(OR)				
10.	a)	Explain the working principle of drone surveying.	7 Marks	L2	CO6	PO1 PO2 PO3 PO5 PO10
	b)	Explain the procedure involved in calculation of length and area in drone surveying.	7 Marks	L2	CO6	PO1 PO2 PO4 PO5

CODE No.: 20BT30201 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Regular Examinations March – 2022

ELECTROMAGNETIC FIELDS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	State and explain Coulomb's law also calculate E due to infinite line charge distribution.	7 Marks	L1	CO1	PO1 PO2
	b)	A point charge of 10C is located at (1, 1, 2) in free space, while a charge of 1C is at (4, 1, 3). Find the coordinated of the point at which a point charge experience no force.	7 Marks	L3	CO1	PO1 PO2
		(OR)				
2.	a)	If a sphere of radius 'a' has a charge density $\rho_v = kr^3$ then find **D** and ▼. **D** as a function of radius 'r' and sketch the result. Assume k constant.	7 Marks	L3	CO1	PO1 PO2
	b)	Find the stored energy in a system of four identical charges Q=4 nC at the corners of a square of 1 m on a side.	7 Marks	L2	CO1	PO1 PO2

UNIT-II

3.	a)	Derive an expression for electric field intensity due to an electric dipole.	7 Marks	L2	CO1	PO1 PO2
	b)	Find the total current in outward direction from a cube of 1m, with one corner at the origin and edges parallel to the coordinate axes if, $\vec{J} = 2x^2\vec{a}_x + 2xy^3\vec{a}_y + 2xy^3\vec{a}_z \ A/m^2$.	7 Marks	L3	CO1	PO1 PO2
		(OR)				
4.	a)	Explain and derive the boundary conditions for a conductor –free space interface.	7 Marks	L2	CO1	PO1 PO2
	b)	A parallel plate capacitor with a separation of 1 cm has 29 kV applied, when air was the dielectric used. Assume that the dielectric strength of air as 30 kV/cm. A thin piece of glass with ϵ_r=6.5 with a dielectric strength of 290 kV/cm with thickness 0.2 cm is inserted. Find whether glass will break or not.	7 Marks	L3	CO1	PO1 PO2

UNIT-III

5.	a)	Using Biot-Savart's law, derive the expression for H due to conductor of finite length.	7 Marks	L2	CO2	PO1 PO2
	b)	In a cylindrical region 0 < r <0.5m, the current density is **J**=4.5 $e^{-2r}\mathbf{a_z}$ A/m^2 and **J**=0 elsewhere. Use Ampere's law to find **H**.	7 Marks	L3	CO2	PO1 PO2
		(OR)				
6.	a)	Find the flux passing the portion of the plane $\phi = \pi/4$ defined by 0.01< r < 0.05 m and 0 < z < 2 m. A current filament of 2.5A is along the z axis in the $\vec{a}_z$ direction, in free space.	7 Marks	L3	CO2	PO1 PO2
	b)	Using amperes circuital law, find **H** and **B** inside a long straight non magnetic conductor of radius 8 mm carrying a current density of 50kA/m^2.	7 Marks	L3	CO2	PO1 PO2

UNIT-IV

7.	a)	Two long parallel wires separated 2 m apart carry currents of 50 A and 100 A respectively in the same direction. Determine the magnitude and direction of the force between them per unit length.	7 Marks	L3	CO3	PO1 PO2
	b)	Find inductance per unit length of a coaxial cable if radius of inner and outer conductors is 1 mm and 3 mm respectively. Assume relative permeability unity.	7 Marks	L3	CO3	PO1 PO2
		(OR)				
8.	a)	Derive an expression for torque produced on a rectangular current loop if placed in a magnetic filed **B**. Show that $\vec{T} = \vec{m}\ X\ \vec{B}$ also holds for the system.	7 Marks	L2	CO3	PO1 PO2
	b)	A coil of 500 turns is wound on a closed iron ring of mean radius 10 cm and cross sectional area of 3 cm^2. Find the self inductance of the winding if the relative permittivity of iron is 800.	7 Marks	L3	CO3	PO1 PO2

UNIT-V

9.	a)	Derive the expression for one of the Maxwell's equation $\nabla x\ \vec{E} = \frac{-\partial \vec{B}}{\partial t}$.	7 Marks	L2	CO4	PO1 PO2
	b)	Show that the ratio of the amplitude of the conduction current and displacement current density is $\sigma/\omega\in$ for the applied field $E = E_{max} \cos\omega t$. Where $\in$ = permittivity of medium.	7 Marks	L3	CO4	PO1 PO2
		(OR)				
10.	a)	Explain the following terms: i) Motional EMF. ii) Static EMF.	7 Marks	L1	CO4	PO1 PO2
	b)	State and prove the Poynting theorem.	7 Marks	L2	CO4	PO1 PO2

CODE No.: 20BT30202 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Regular Examinations March – 2022

ELECTRICAL MACHINES - I

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain each part of DC generator with neat sketch.	8 Marks	L2	CO1	PO1
	b)	Compare lap and wave winding.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Derive **emf** equation of DC generator.	7 Marks	L2	CO1	PO1
	b)	A 4-pole DC shunt generator with shunt field resistance of 100Ω and armature resistance of 1Ω has 378 wave connected conductors in its armature and the generator is driven at 1000 r.p.m. Calculate the power absorbed by the load.	7 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Explain the process of commutation in DC generators with the help of diagrams.	8 Marks	L2	CO2	PO1
	b)	A four pole DC generator supplies a current of 100A at full load. It has wave wound armature with 722 conductors. If the brush lead is 8 degrees, calculate the armature demagnetizing and cross magnetizing ampere turns per pole.	6 Marks	L3	CO2	PO4
		(OR)				
4.	a)	What is self-excitation? What are the conditions for building up of voltage in dc shunt generator?	7 Marks	L2	CO2	PO2
	b)	Discuss the internal and external characteristics of DC shunt generator.	7 Marks	L2	CO2	PO2

UNIT-III

5.	a)	Derive the torque equation of a DC motor.	7 Marks	L2	CO3	PO2
	b)	The armature resistance of a DC shunt motor is 0.5Ω. It draws 20A from 220V mains and is running at a speed of 770 r.p.m. Determine induced **emf** and electromagnetic torque.	7 Marks	L3	CO3	PO4
		(OR)				
6.	a)	Explain why a starter is required to start a DC motor and describe three point starter with neat diagram.	7 Marks	L2	CO3	PO2
	b)	A DC shunt motor runs at 1000 r.p.m on 220V supply. Its armature and field resistances are 0.5Ω and 110Ω respectively and the total current taken from the supply is 26A. It is desired to reduce the speed to 750 r.p.m keeping the armature and field currents same. What resistance should be added in the armature circuit?	7 Marks	L3	CO3	PO4

UNIT-IV

7.	a)	Discuss the operation of single phase transformer with neat diagram.	6 Marks	L2	CO4	PO1
	b)	A 6600/440V single phase 600 KVA transformer has 1200 primary turns. Find i) Transformation ratio ii) Secondary turns iii) Voltage / turn iv) Secondary current when it supplies a load of 400 kW at 0.8 p.f. lagging.	8 Marks	L3	CO4	PO2

(OR)

8.	a)	List the losses, which occur in a loaded transformer. Deduce the relationship between losses for maximum efficiency.	6 Marks	L2	CO4	PO7
	b)	A 600kVA, distribution transformer has copper and iron losses of 5.6 kW and 3.2kW respectively on full load. The transformer is loaded as shown below. **Loading (kW) Power factor(lag) No. of hours** i) 500KW, 0.9 pf (Lag), 8hours. ii) 400KW, 0.8 pf (lag), 10 hours. iii) 50KW, 0.75 pf (lag), 4hours. iv) No load – 02hours. Calculate the all day efficiency.	8 Marks	L3	CO4	PO4

UNIT-V

9.	a)	Discuss the construction of three phase core type and shell type transformers with the help of diagrams.	7 Marks	L2	CO4	PO1
	b)	Three number of single phase *ideal* transformers, each of rating. 20kVA, 400V / 200V, 50Hz is connected in delta/star fashion to supply a balanced three phase 20 kW, 0.8 power factor load at 200V (line to line). Draw a circuit diagram for this. Calculate: i) What line to line voltage should be applied to the primary side? ii) Calculate the line and phase currents on the secondary and primary sides and indicate them on the diagram.	7 Marks	L3	CO4	PO4

(OR)

10.	a)	Explain with necessary diagrams how 3-phase supply is converted to 2-phase by scott connection.	7 Marks	L2	CO4	PO2
	b)	Explain the working of an on load tap changer with the help neat diagram.	7 Marks	L2	CO4	PO2

CODE No.: 20BT30203 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Regular Examinations March – 2022

SIGNALS AND NETWORKS

[Electrical and Electronics Engineering]

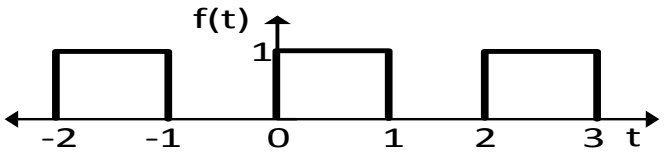
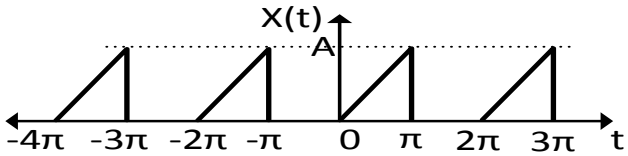
Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

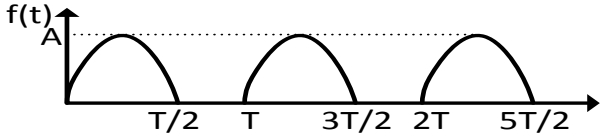
UNIT-I

1.	a)	Test whether the following systems are causal or non-causal systems. i) $y(n) = x(n) + x^2(n-1)$. (ii) $y(n) = x(2n)$.	8 Marks	L3	CO1	PO2
	b)	Sketch $y(t) = r(t) + r(t-1) + r(t-2) + r(t-3)$ where $r(t)$ is a unit ramp signal.	6 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Investigate whether the signal given by $x(t) = nu(t)$ is a power or energy signal?	6 Marks	L3	CO1	PO2
	b)	Determine if the system described by the following input-output equations is linear or non-linear. i) $y(n) = x(n) + \frac{1}{x(n-1)}$. (ii) $y(n) = x(2n)$.	8 Marks	L3	CO1	PO2

UNIT-II

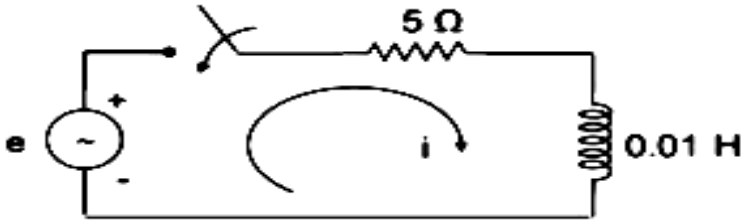
3.	a)	Distinguish between Fourier series and Fourier transforms	5 Marks	L2	CO2	PO1
	b)	Determine the Fourier series expansion for the waveform shown below. 	9 Marks	L3	CO2	PO5
		(OR)				
4.	a)	Obtain the trigonometric Fourier series for the periodic waveform shown below. 	9 Marks	L3	CO2	PO5
	b)	Find the Fourier transform of the function $\cos\omega_o t$.	5 Marks	L3	CO2	PO5

UNIT-III

5.	a)	Find the Laplace transform of the periodic signal shown below. 	7 Marks	L3	CO2	PO5
	b)	Find the inverse Z-transform of $X(z) = \frac{Z+1}{z^2 - \frac{7}{12}z + \frac{1}{12}}$.	7 Marks	L3	CO2	PO5
		(OR)				

6.	a)	Explain initial and final value theorems.	6 Marks	L3	CO2	PO5
	b)	Determine the frequency response of the system described by the difference equation $y(n) + 0.75y(n-1) = x(n) - 2x(n-1)$.	8 Marks	L3	CO2	PO5

UNIT-IV

7.	a)	In the initially relaxed RL circuit shown in the figure below, the sinusoidal source $e(t) = 100\sin(500t)$ volts is applied at time t=0. Determine resultant transient current for time t > 0. 	7 Marks	L3	CO3	PO5
	b)	A series RLC circuit comprises of $R=30\Omega$, $L=0.6H$ *and* $C=2\mu$ is excited by a constant voltage source of 50 volts. Obtain the expression for the current. (Assume that the circuit is relaxed initially).	7 Marks	L3	CO3	PO5

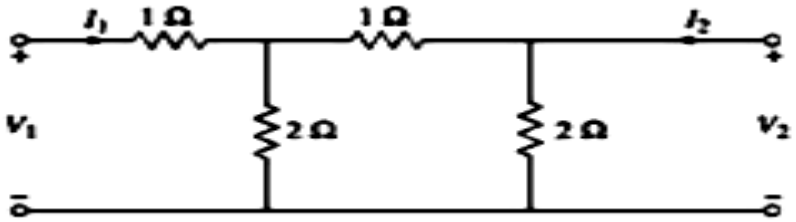
(OR)

8.	a)	Discuss the transient response of series RL circuit with **dc** excitation. Calculate circuit current and element voltages.	7 Marks	L3	CO3	PO5
	b)	A time-dependent voltage *V(t)* is applied to a series connection of RLC network. Find s-domain impedance and current. Assume initial condition of the voltage in inductor and current in capacitor to be zero. Draw the t-domain and s-domain circuits.	7 Marks	L3	CO3	PO5

UNIT-V

9.	a)	Obtain the relationship between ABCD and Y parameters.	7 Marks	L2	CO4	PO2
	b)	If the currents i_1 and i_2 are entering at port 1 and port 2 respectively of a two-port network and the equations are given below: $l_1 = 0.7V_1 - 0.8V_2, \quad l_2 = 0.5V_1 + 2V_2$ Find Y and Z parameters of the network.	7 Marks	L3	CO4	PO4

(OR)

10.	a)	Write short notes on Z, Y, T and h parameters.	7 Marks	L2	CO4	PO2
	b)	Find the Z- parameters of the network shown in the figure below. 	7 Marks	L3	CO4	PO4

❀ ❀ ❀

CODE No.: 20BT30301 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Regular Examinations March – 2022

ENGINEERING THERMODYNAMICS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define system and explain the different types of thermodynamic systems.	7 Marks	L2	CO1	PO1
	b)	A system of volume 'v' contains a man m of gas at pressure 'p' and temperature's' the microscopic properties of the system obey the following relationship $[p + a/v^2][v-b]=mRT$, where a, b, R are constants obtain an expression for the displacement work done by the system. During a constant temperature expansion from volume v_1 to v_2.	7 Marks	L3	CO1	PO1 PO2
		(OR)				
2.	a)	Write S.F.E.E equation for steam turbine.	7 Marks	L2	CO1	PO1
	b)	A gas flow steadily through a rotary compressor the gas enter the compressor at a temperature of 16^0c a pressure of 100Kpa and entropy of 391.2Kj/Kg the gas leaves the compressor at a temperature of 245^0c a pressure of 0.6Mpa and enthalpy of 534.5Kj/Kg there is no heat transfer (i) evaluate external work done per unit mass of gas assuming velocities are neglected (ii) evaluate external work done per unit mass of gas when the gas voltage entry is 80m/s and exit is 160m/s.	7 Marks	L3	CO1	PO1 PO3

UNIT-II

3.	a)	Define the terms i) available energy ii) unavailable energy and write the relation between them and also define PMM2.	7 Marks	L2	CO1	PO1
	b)	Two reversible heat engines A and B are arranged in series, A rejecting heat directly to B. engine A receives 200kJ at a temperature of 421^oC from a hot temperature reservoir while Engine B is communication with Cold sink temperature of 4.4^oC. if the work output of A is thrice that of B find the intermediate temperature between A & B and also efficiency of engines A & B.	7 Marks	L3	CO1	PO1 PO3
		(OR)				
4.	a)	Stat and prove carrot theorem.	7 Marks	L2	CO1	PO1
	b)	Two kg of water at 80^oC are mixed adiabatically with 3kg of water at 30^oC in a constant pressure process of 1atmosphere. Find the increase in entropy of the total mass of water due to mixing process. Take specific of water is 4.187kJ/kg-K.	7 Marks	L3	CO1	PO1 PO3

UNIT-III

5.	a)	Illustrate with a neat sketch P-V and T-S diagrams of a Pure substance.	7 Marks	L2	CO2	PO1 PO3 PO10
	b)	Calculate the internal energy per kg of super heated steam at a pressure of 5 bar and a temperature of 200°C. Also find the change in internal energy, if the steam expanded to 1 bar and dryness fraction is 0.75.	7 Marks	L3	CO2	PO1 PO2

(OR)

6.	a)	Using Maxwell relations obtain the expression for difference of specific heats at constant pressure and constant volume in terms of the derivatives of the properties and hence obtain its expression for an ideal gas.	7 Marks	L2	CO2	PO1 PO2
	b)	Explicate the terms Dry bulb temperature Wet bulb temperature psycho meter and adiabatic saturation temperature.	7 Marks	L2	CO2	PO1 PO10

UNIT-IV

7.	a)	State and explain Daltons law of partial pressure	7 Marks	L2	CO3	PO1 PO2
	b)	0.5kg of helium and 0.5kg of nitrogen are mixed at 20°C and a total pressure of 100KPa. Find total volume of the mixture, partial volume of the mixture, partial pressure of the component, mole fraction of the component specific heats of the mixtures gas constant of the mixtures.	7 Marks	L3	CO3	PO1

(OR)

8.	a)	Distinguish between Universal Gas constant and Characteristic Gas constant. Also define Mole fraction and mass fraction.	7 Marks	L2	CO3	PO1 PO2
	b)	A gaseous mixture consists of 1 kg of oxygen and 2 kg of nitrogen at a pressure of 150 kPa and a temperature of 20°C. Determine the changes in internal energy, enthalpy and entropy of the mixture when the mixture is heated to a temperature of 100°C (i) at constant volume and (ii) at constant pressure.	7 Marks	L3	CO3	PO2

UNIT-V

9.	a)	Illustrate with a neat sketch various operations of S.I. Engine on P-V diagram.	7 Marks	L2	CO4	PO1
	b)	In an air standard diesel cycle the compression ratio is 15, compression begins at 0.1MPa, 40°C the heat is added is 1.675MJ/Kg. find the maximum temperature of the cycle, cut off ratio and thermal efficiency.	7 Marks	L3	CO4	PO1 PO2 PO6

(OR)

10.	a)	Draw the PV and TS diagram of dual cycle and mentioned the processes.	7 Marks	L2	CO4	PO1
	b)	Derive an expression for thermal efficiency of Otto cycle.	7 Marks	L3	CO4	PO1 PO2

CODE No.: 20BT30302 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Regular Examinations March – 2022

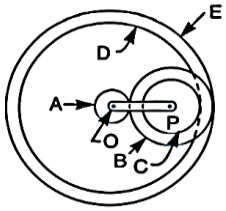
KINEMATICS OF MACHINERY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Classify Kinematic pairs based on type of relative motion, contact and closure and explain them by giving examples for each one of them.	9 Marks	L2	CO1	PO1
	b)	What is a machine? Giving example, differentiate between a machine and a structure.	5 Marks	L2	CO1	PO1
		(OR)				
2.		Sketch and explain the various inversions of a slider crank chain.	14 Marks	L2	CO1	PO1
		UNIT-II				
3.		What are straight line mechanisms? Describe ant two type of exact straight line motion mechanism with the help of a sketch.	14 Marks	L2	CO2	PO1 PO2
		(OR)				
4.	a)	Explain the difference between the Ackerman and Davis steering gear.	4 Marks	L2	CO2	PO1 PO2
	b)	Two shafts with an included angle of 160° are connected by a Hooke's joint. The driving shaft runs at a uniform speed of 1500 r.p.m. The driven shaft carries a flywheel of mass 12 kg and 100 mm radius of gyration. Find the maximum angular acceleration of the driven shaft and the maximum torque required.	10 Marks	L3	CO3	PO1 PO2
		UNIT-III				
5.		The following data relate to a pair of 20° involute gears in mesh: Module = 6 mm, Number of teeth on pinion = 17, Number of teeth on gear = 49; Addenda on pinion and gear wheel = 1 module. Find : (a). The number of pairs of teeth in contact ; (b). The angle turned through by the pinion and the gear wheel when one pair of teeth is in contact, and (c). The ratio of sliding to rolling motion when the tip of a tooth on the larger wheel (i) is just making contact, (ii) is just leaving contact with its mating tooth, and (iii) is at the pitch point.	14 Marks	L4	CO4	PO1 PO2 PO3
		(OR)				
6.		Figure below shows diagrammatically a compound epicyclic gear train. Wheels A, D and E are free to rotate independently on spindle O, while B and C are compound and rotate together on spindle P, on the end of arm OP. All the teeth on different wheels have the same module. A has 12 teeth, B has 30 teeth and C has 14 teeth cut externally. Find the number of teeth on wheels D and E which are cut internally. If the wheel A is driven clockwise at 1 r.p.s. while D is driven counter clockwise at 5 r.p.s., determine the magnitude and direction of the angular velocities of arm OP and wheel E.	14 Marks	L4	CO4	PO1 PO2 PO3



UNIT-IV

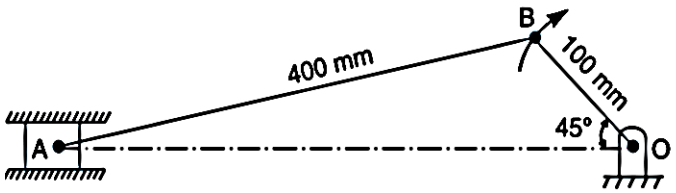
7.	a)	Define the terms Base circle, Pressure angle, Pitch point, Pich circle, Prime circle and Lift or Stroke used in Cam design.	8 Marks	L2	CO4	PO1 PO2 PO3
	b)	Classify of Cams and explain them.	6 Marks	L2	CO4	PO1 PO2 PO3

(OR)

8.	A cam, with a minimum radius of 50 mm, rotating clockwise at a uniform speed, is required to give a knife edge follower the motion as described below: (a). To move outwards through 40 mm during 100° rotation of the cam; (b). To dwell for next 80° ; (c). To return to its starting position during next 90°, and (d). To dwell for the rest period of a revolution i.e. 90°. Draw the profile of the cam (i) when the line of stroke of the follower passes through the centre of the cam shaft, and (ii) when the line of stroke of the follower is off-set by 15 mm. The displacement of the follower is to take place with uniform acceleration and uniform retardation. Determine the maximum velocity and acceleration of the follower when the cam shaft rotates at 900 r.p.m. Draw the displacement, velocity and acceleration diagrams for one complete revolution of the cam.	14 Marks	L3	CO5	PO1 PO2 PO3 PO10

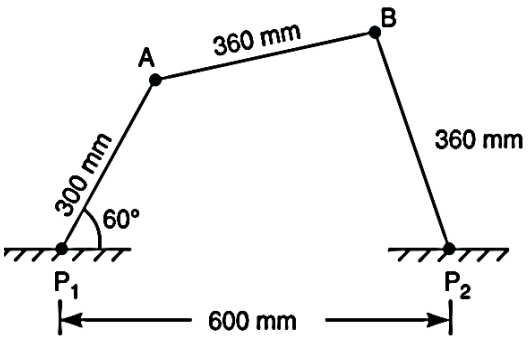
UNIT-V

9.	Locate all the instantaneous centres of the slider crank mechanism as shown in figure below. The lengths of crank OB and connecting rod AB are 100 mm and 400 mm respectively. If the crank rotates clockwise with an angular velocity of 10 rad/s, find: (a). Velocity of the slider A, and (b). Angular velocity of the connecting rod AB.	14 Marks	L4	CO6	PO1 PO2 PO3 PO10



(OR)

10.	The dimensions and configuration of the four bar mechanism, shown in figure are as follows : P_1A = 300 mm; P_2B = 360 mm; AB = 360 mm, and P_1P_2 = 600 mm. The angle AP_1P_2 = 60°. The crank P_1A has an angular velocity of 10 rad/s and an angular acceleration of 30 rad/s^2 , both clockwise. Determine the angular velocities and angular accelerations of P_2B, and AB and the velocity and acceleration of the joint B.	14 Marks	L4	CO6	PO1 PO2 PO3 PO10



CODE No.: 20BT30303 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Regular Examinations March – 2022

MANUFACTURING TECHNOLOGY
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	List and explain the considerations for selecting pattern materials.	7 Marks	L1	CO1	PO1
	b)	Define gating ratio. Illustrate the steps involved in designing a gating system.	7 Marks	L2	CO1	PO2
		(OR)				
2.	a)	What are the common allowances provided on patterns? Why and how they are provided? Give suitable examples.	7 Marks	L1	CO1	PO1
	b)	Calculate the optimum pouring time for a casting whose mass is 20kg and having an average section thickness of 15mm. The materials of the casting are grey cast iron and steel. Take the fluidity of iron as 711.2mm.	7 Marks	L2	CO1	PO3
		UNIT-II				
3.	a)	Describe centrifugal casting process and to what work piece configuration it is best suited.	7 Marks	L2	CO2	PO1
	b)	Mention the classification of casting defects and their causes and remedies.	7 Marks	L1	CO2	PO3
		(OR)				
4.	a)	What is Investment casting? What is the main material used for making an Investment Pattern? What are the methods of applying the Investment material to the pattern?	7 Marks	L2	CO2	PO1
	b)	Write short notes on cleaning and finishing of castings.	7 Marks	L1	CO2	PO2
		UNIT-III				
5.	a)	Describe the principles of hot and cold working processes. Compare them.	7 Marks	L1	CO3	PO4
	b)	Summarize the Magnetic pulse forming process with a neat sketch.	7 Marks	L2	CO3	PO2
		(OR)				
6.	a)	Explain how Forging improves the mechanical properties of the components.	7 Marks	L2	CO3	PO3
	b)	Briefly explain about the progressive dies used in sheet metal operations.	7 Marks	L1	CO3	PO4
		UNIT-IV				
7.	a)	Discuss the method of resistance welding. What are its advantages and disadvantages?	7 Marks	L1	CO4	PO3
	b)	Explain Oxy– Acetylene Gas cutting in detail.	7 Marks	L2	CO4	PO1
		(OR)				
8.	a)	Explain briefly the problems faced in Submerged Arc Welding in Horizontal and Vertical Welding Positions.	7 Marks	L2	CO4	PO2
	b)	Explain about destructive and nondestructive testing of welds.	7 Marks	L2	CO4	PO1

UNIT-V

9.	a)	Describe the working principle of Injection moulding process.	7 Marks	L2	CO5	PO2
	b)	Differentiate between thermoplastics and thermosetting resins with relevant examples.	7 Marks	L1	CO5	PO3
		(OR)				
10.	a)	Describe the working principle of blow moulding process.	7 Marks	L2	CO5	PO2
	b)	Write short notes on calendaring.	7 Marks	L1	CO5	PO3

CODE No.: 20BT30304 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Regular Examinations March – 2022

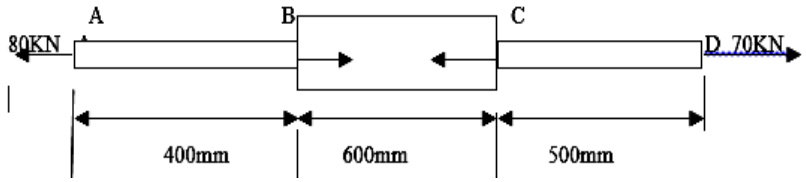
STRENGTH OF MATERIALS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	State Hooke's Law.	2 Marks	L1	CO1	PO1
	b)	A steel bar is loaded as shown in figure. Find the change in length of bar Take. E = 200GN/m^2 Diameters of AB = 20mm, BC = 40mm and CD = 20mm. Load at B= 60 KN and C= 50 KN. 	12 Marks	L3	CO1	PO1 PO2

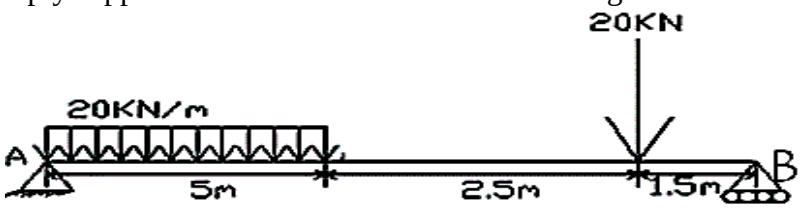
(OR)

2.	a)	A rod 200 cm long and diameter 3.0 cm is subjected to an axial pull of 30 kN. If the Young's modulus of the material of the tube rod is 2x10^5 N/mm^2, determine: i) stress. ii) strain. iii) the elongation of the rod.	7 Marks	L3	CO1	PO1 PO2
	b)	In a hollow circular shaft of outer and inner diameters of 20 cm and 10 cm respectively, the shear stress is not to exceed 40 N/mm^2. Calculate the maximum torque which the shaft can safely transmit.	7 Marks	L3	CO1	PO1 PO2

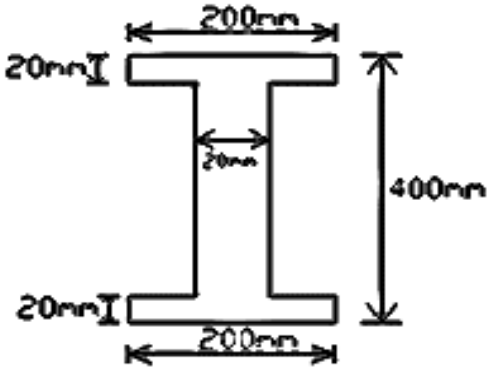
UNIT-II

3.	a)	Explain Point of contra flexure.	4 Marks	L1	CO2	PO2 PO3
	b)	A simply supported wooden beam of span 1.5m, having cross section 100m wide and 250mm deep carries a concentrated load of W at the centre. If the allowable bending stress is 10N/mm^2 and shear stress is 1.5 N/mm^2. i) Calculate maximum bending moment and shear force. ii) Determine the safe load W.	10 Marks	L3	CO2	PO2 PO3

(OR)

4.		Draw the shear force and bending moment diagrams for the simply supported beam loaded as shown in the figure. 	14 Marks	L3	CO2	PO1 PO2

UNIT-III

5.		Determine the maximum tensile and compressive bending stresses in a cantilever beam of 2m span, subjected to an uniformly distributed load of 10kN/m, throughout the length. The cross section of the beam is as shown in the figure. 	14 Marks	L3	CO2	PO1 PO5
		(OR)				
6.	a)	Discuss how you determine section modulus of channels.	4 Marks	L1	CO2	PO1 PO5
	b)	A T-section beam of flange 200mm x 20mm and web 250mm x 25mm is subjected to a bending moment of 30KN-m. Draw the bending stress distribution across the section. Calculate the position of the neutral Axis.	10 Marks	L3	CO2	PO1 PO2

UNIT-IV

7.	a)	Demonstrate Mohr's circle construction.	6 Marks	L2	CO3	PO1 PO5
	b)	An elemental cube is subjected to tensile stresses of 60 N/mm^2 and 20 N/mm^2 acting on two mutually perpendicular planes and a shear stress of 20 N/mm^2 on these planes. Draw the Mohr's circle of stresses and hence or otherwise determine the magnitudes and directions of principal stresses and also the greatest shear stress.	8 Marks	L3	CO3	PO1 PO5
		(OR)				
8.	a)	Two shafts of same material and same lengths are subjected to some torque, if the first shaft is of a solid circular section and the second shaft is of hollow circular section whose internal diameter is 0.7 times outside diameter and the maximum shear stress developed in each shaft is same; compare the weights of the shafts.	7 Marks	L3	CO3	PO1 PO2
	b)	In a hollow circular shaft of outer and inner diameters of 20 cm and 10 cm respectively, the shear stress is not to exceed 40 N/mm^2. Calculate the maximum torque which the shaft can safely transmit.	7 Marks	L3	CO3	PO1 PO2 PO5

UNIT-V

9.	a)	Explain Macaulay's methods.	4 Marks	L2	CO4	PO1 PO2
	b)	A simply supported beam of length 8m is subjected to a single force 50KN at a distance '5m' from one of the supports. i) Calculate the deflection under the load. ii) Calculate slope under the load.	10 Marks	L3	CO4	PO1 PO2
		(OR)				
10.	a)	Explain how to determine slope and deflection of simply supported beam subjected uniformly varying loads using Moment area method.	6 Marks	L2	CO4	PO1 PO2
	b)	A cantilever of length 2 metres carries a uniformly distributed load of 2500 N per metre for a length of 1.25 metres from the fixed end and a point load of 1000 N at the free end. If the section is	8 Marks	L2	CO4	PO1 PO2 PO5

rectangular 120 mm side and 240 mm deep, i) find the deflection at the free end. Take E=1000 N/mm^2. ii) find the slope at the free end.

CODE No.: 20BT30401 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Regular Examinations March – 2022

ELECTROMAGNETIC FIELDS AND TRANSMISSION LINES

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Develop the relations between Electric field intensity and Electric potential.	7 Marks	L3	CO1	PO1
	b)	Point charges 5 nC and -2 nC are located at (2, 0, 4) and (-3, 0, 5) respectively. i) Determine the force on a 1 nC point charge located at (1, -3, 7). ii) Determine the electric Field E at (1, -3, 7).	7 Marks	L4	CO1	PO2
		(OR)				
2.	a)	Derive the expression for the force between two finite current carrying loops.	7 Marks	L1	CO1	PO1
	b)	A current sheet = 8 x A/m lies in z = 10 m plane and current filament is located at y = 0, z = 9 m. Determine I in current filament if = 0 at P (3, 0, 1) m.	7 Marks	L4	CO1	PO2

UNIT-II

3.	a)	Express Maxwell equations for time varying fields in both differential and integral forms and make their word statements	7 Marks	L2	CO2	PO3
	b)	Let $\mu = 10^{-5}$ H/m, $\varepsilon = 4x10^{-9}$ F/m, $\sigma = 0$, and $\rho v = 0$. Determine k so that the following pair satisfy Maxwell's equations $D = 6\,ax - 2y\,ay + 2z\,az\ nC/m^2$, $H = kx\,ax + 10y\,ay - 25\,az A/m$.	7 Marks	L6	CO2	PO2
		(OR)				
4.	a)	Explain the application note on Material with high dielectric constant.	7 Marks	L4	CO2	PO2
	b)	Develop the expression for Relaxation time.	7 Marks	L4	CO2	PO2

UNIT-III

5.	a)	Discuss the electromagnetic wave propagation in a lossless dielctric medium.	7 Marks	L2	CO3	PO1
	b)	A 30 GHz radar signal may be represented as a uniform plane wave in a sufficiently small region. Calculate the wavelength in cm and the attenuation in dB per foot if the wave is propagating in a non magnetic material for which $\varepsilon_r = 1$ and $\sigma = 0$.	7 Marks	L3	CO3	PO1
		(OR)				
6.	a)	Obtain the wave equation for a conducting medium.	7 Marks	L2	CO3	PO1
	b)	The magnetic field **H** of a plane wave has a magnitude of 9 mA/m in a medium defined by $\varepsilon_r = 3$, $\mu_r = 2$. Determine the average power flow.	7 Marks	L3	CO3	PO1

UNIT-IV

7.	a)	Derive the relation between Primary and secondary constants of a transmission line.	7 Marks	L2	CO4	PO1
	b)	A transmission line in which no distortion is present has the following parameters Zo=50Ω, $\alpha = 0.02m^{-1}$,v= $0.6v_0$. Determine R.L, G, C and wavelength at 0.1 GHz.	7 Marks	L4	CO4	PO4
		(OR)				
8.	a)	Derive the expressions for voltage, current and input impedance of an infinite line.	7 Marks	L2	CO4	PO1
	b)	A lossless transmission line used in a TV receiver has a capacitance of 50pF/m and an inductance of 200 nH/m. Evaluate the characteristic impedance for section of a line 10 m long and 500 m long.	7 Marks	L4	CO4	PO1

UNIT-V

9.	a)	Explain in detail about single stub tuner.	7 Marks	L2	CO4	PO1
	b)	Determine the input impedance of λ/8 line when it is terminated with a short circuit and also open circuit.	7 Marks	L3	CO4	PO4
		(OR)				
10.	a)	Demonstrate the procedure of finding first voltage minimum and first voltage maximum using smith chart.	7 Marks	L2	CO4	PO2
	b)	Design a stub to match a transmission line which is connected to a load impedance of 400-j350 Ω. The characteristic impedance of the line is 200 Ω. The operating frequency is 15 MHz.	7 Marks	L3	CO4	PO4

CODE No.: 20BT30402 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Regular Examinations March – 2022

ELECTRONIC DEVICES AND CIRCUITS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Sketch the output response of a low pass RC circuit excited by step and exponential waveforms for different time constants.	7 Marks	L2	CO1	PO2
	b)	A symmetrical square wave of peak-peak amplitude 10V and frequency 10KHz is applied to a High pass RC circuit. Sketch the input and output waveforms to scale and derive the necessary output voltage expressions.	7 Marks	L3	CO1	PO2
		(OR)				
2.	a)	With the help of neat circuit diagram, explain the working of positive clamping circuit.	7 Marks	L2	CO1	PO2
	b)	A rectangular wave whose peak to peak value is 1v extends ±0.5v with respect to ground. The duration of the positive section is 0.1 sec and of the negative section 0.2 sec. If this waveform is impressed upon an RC differentiating circuit whose time constant is 0.2 sec, what are steady state maximum and minimum values of output waveform?	7 Marks	L3	CO1	PO2
		UNIT-II				
3.	a)	A Germanium transistor is used in a voltage divider biasing circuit with V_{cc}=16V, R_c=1.5kΩ and β=50. The operating point desired is V_{CE}=8V and I_c=4mA. If a stability factor=10 is desired, calculate the values of R_1, R_2 and R_E of the circuit.	7 Marks	L3	CO2	PO2
	b)	Explain thermal runway and stabilization techniques.	7 Marks	L1	CO2	PO1
		(OR)				
4.	a)	Describe the circuit of self based CE amplifier using diode compensation for I_{CO}.	7 Marks	L2	CO2	PO2
	b)	Explain thermistor bias compensation technique.	7 Marks	L1	CO2	PO1
		UNIT-III				
5.	a)	Derive the expression for A_v, A_I, R_i and R_o of a transistor amplifier in CE configuration using low frequency h-parameter model.	7 Marks	L2	CO2	PO2
	b)	For a CE amplifier, if a load R_L = 1kΩ is connected and h_{ie}=1kΩ, h_{re}=2 x 10^{-4}, h_{fe}=50, h_{oe}=25μA/V, then calculate A_I, A_V and R_i	7 Marks	L3	CO2	PO2
		(OR)				
6.	a)	Compare transistor amplifiers in CE, CB and CC configurations in terms of A_V, A_I, R_i and R_o	7 Marks	L2	CO2	PO1
	b)	Draw the common emitter amplifier with an emitter resistance and derive the expressions for A_v, A_I, and R_i using simplified CE hybrid model.	7 Marks	L1	CO2	PO2

UNIT-IV

7.	a)	Compare JFET and BJT.	7 Marks	L2	CO2	PO1
	b)	Draw and explain drain characteristics of enhancement MOSFET.	7 Marks	L1	CO2	PO2
		(OR)				
8.	a)	Define R_d, g_m and μ of JFET & derive the relation between them.	7 Marks	L2	CO2	PO1
	b)	JFET amplified with voltage divider biasing circuit have V_{DD}=24V, V_p=-2V, I_{DSS}=4mA, R_D=910Ω, R_s=3kΩ, R_1=12MΩ, R_2=8.57MΩ. Find the drain current at the operating point.	7 Marks	L3	CO2	PO2

UNIT-V

9.	a)	Explain the working of SCR with neat diagrams.	7 Marks	L2	CO2	PO1
	b)	Draw the circuit of UJT relaxation oscillator. Explain the working of oscillator with neat voltage waveforms.	7 Marks	L1	CO2	PO1
		(OR)				
10.	a)	What is tunnelling and explain the effect of tunnelling on VI characteristics of Tunnel diode.	7 Marks	L1	CO2	PO2
	b)	Explain the operation DIAC with the help of its structure and characteristics.	7 Marks	L2	CO2	PO2

CODE No.: 20BT30403 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Regular Examinations March – 2022

SIGNALS AND SYSTEMS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Sketch the following signals: i) $x_1(t) = u(t) - 2u(t-1) + u(t-2)$. ii) $x_2(t) = u(t+2) - u(t-2)$. iii) $x_3(t) = r(t) - r(t-1) - r(t-3) + r(t-4)$.	7 Marks	L3	CO1	PO2
	b)	Identify the following systems whether time invariant, linear and causal systems: i) $y(t) = \int_{-\infty}^{2t} x(\tau)\,d\tau$. ii) $y(t) = \frac{d}{dt}\,x(t)$.	7 Marks	L4	CO1	PO2
		(OR)				
2.	a)	Why the unit step signal u(t) is neither even nor odd? Determine the even and odd parts of u(t).	7 Marks	L3	CO1	PO2
	b)	Prove that $x(t) * \delta(t-t_0) = x(t-t_0)$.	7 Marks	L2	CO1	PO2

UNIT-II

3.	a)	Expand the following periodic function f(t) over the interval (-2, 2) by a complex Fourier Series $f(t) = \begin{cases} 2; & -1 < t < 1; \\ 0; & Otherwise; \end{cases}$	7 Marks	L3	CO2	PO2
	b)	Discuss the following properties of Fourier transform: i) Convolution in time domain. ii) Duality Property.	7 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Find the trigonometric Fourier series of half-wave rectified signal and draw the amplitude and phase spectrum.	7 Marks	L3	CO2	PO2
	b)	The Fourier transform of $x(t)$ *is* $X(w) = \frac{6}{4+jw}$. Find the Fourier transform of the signal given by $f(t) = e^{-j3t}\,x(t-2)$.	7 Marks	L4	CO2	PO2

UNIT-III

5.	a)	If the impulse response of the system $h(t) = \delta(t+2) + 2\delta(t+1)$ and the input signal $x(t) = \begin{cases} t+1; & 0 \le t \le 1 \\ 2-t; & 1 \le t \le 2 \\ 0; & elsewhere \end{cases}$. Find the output of the system.	7 Marks	L4	CO3	PO2
	b)	Explain the method of detection of periodic signals in the presence of noise by correlation.	7 Marks	L2	CO3	PO1
		(OR)				

6.	a)	Discuss the properties of Auto correlation function for energy signals.	7 Marks	L2	CO3	PO1
	b)	Determine the correlation of the signals $x(t) = e^{-2t}\,u(t)$ *and* $y(t) = e^{-3t}\,u(t)$.	7 Marks	L4	CO3	PO2

UNIT-IV

7.	a)	Describe reconstruction of sampled signal with the help of interpolation equation. Describe zero order hold and first order hold systems. Describe the practical problems in reconstruction of signals.	7 Marks	L2	CO4	PO1
	b)	State and prove sampling theorem and discuss the effects of aliasing.	7 Marks	L2	CO4	PO1

(OR)

8.	a)	A signal $x(t) = \sin c(300\pi t)$ is sampled at a rate of : i) 200Hz. ii) 400Hz. iii) 600Hz. For each of these three cases, explain if you can recover the signal x(t) from the sampled signal.	7 Marks	L4	CO4	PO2
	b)	Describe the various types of sampling techniques and derive the expression for the flat-top sampled signal.	7 Marks	L2	CO4	PO1

UNIT-V

9.	a)	Check whether the following LTI systems are stable and causal. i) $H(s) = \dfrac{1}{s^2 - s - 6}$; if ROC is Re($s$) < - 2. ii) $H(s) = \dfrac{1}{s^2 - s - 6}$; if ROC is -2 < Re ($s$) < 3.	7 Marks	L3	CO5	PO2
	b)	Discuss the following properties of unilateral Laplace transform: i) Differentiation in time domain. ii) Integration in time domain.	7 Marks	L2	CO5	PO1

(OR)

10.	a)	Determine the initial and final value of *x[n]* for a given below Z transform $X(z) = \dfrac{2z\left(z - \dfrac{5}{12}\right)}{\left(z - \dfrac{1}{2}\right)\left(z - \dfrac{1}{3}\right)}$; $ROC : \lvert z \rvert > \dfrac{1}{2}$.	7 Marks	L4	CO5	PO2
	b)	Determine the inverse Z-Transform of $X(z) = \dfrac{3}{z-2}$; $ROC : \lvert z \rvert > 2$.	7 Marks	L4	CO5	PO2

CODE No.: 20BT30404 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Regular Examinations March – 2022

SWITCHING THEORY AND LOGIC DESIGN

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Perform 2's Complements subtraction between 11110-01110.	7 Marks	L2	CO1	PO1
	b)	Reduce the expression A+B[AC+(B+C')D].	7 Marks	L2	CO1	PO6
		(OR)				
2.	a)	Represent (2DB.48)16 in decimal, binary and octal numbers.	7 Marks	L3	CO1	PO1
	b)	Perform the following addition using excess-3 code. i) 156+323. ii) 5644+245.	7 Marks	L3	CO1	PO1
		UNIT-II				
3.	a)	Simplify the Boolean function using K-map: F (A, B, C, D) = ∑m (0, 2, 4, 6, 11, 13, 15).	7 Marks	L2	CO1	PO1
	b)	Obtain the optimized Boolean function using K-map for F =∏ M (0, 1, 3, 6, 7, 9, 12, 14, 15).	7 Marks	L2	CO1	PO5
		(OR)				
4.	a)	Minimize the following expression using K-map and implement with suitable gates: F = π M(1, 4, 5, 6, 7, 9, 10, 12, 15).	7 Marks	L2	CO2	PO1
	b)	Minimize the Boolean function using K-map: F =∑ m (1, 2, 5, 6, 8, 9, 11, 13, 14).	7 Marks	L2	CO2	PO5
		UNIT-III				
5.	a)	Construct a full adder using two half adders.	7 Marks	L1	CO3	PO1
	b)	Implement a logic circuit that compares the magnitude of two binary numbers A1A0 and B1B0. Use an appropriate decoder and OR gates to implement.	7 Marks	L2	CO3	PO6
		(OR)				
6.	a)	What is decoder? Construct 3*8 decoder using logic gates and truth tables.	7 Marks	L2	CO3	PO1
	b)	Design a 1 x 4 Demultiplexer using logic gates.	7 Marks	L3	CO3	PO5
		UNIT-IV				
7.	a)	Illustrate the working of SR flip-flop using NAND gates.	7 Marks	L1	CO4	PO1
	b)	Explain the working of universal shift register with neat diagram.	7 Marks	L2	CO4	PO1
		(OR)				
8.	a)	Draw and illustrate the operation of a 3-bit ripple UP counter using JK flip-flops.	7 Marks	L2	CO4	PO1
	b)	Sketch the logic circuit for MOD-5 Asynchronous counter.	7 Marks	L2	CO4	PO5
		UNIT-V				
9.	a)	Obtain the realization of 3 bit even parity generator using a PROM.	7 Marks	L1	CO5	PO1
	b)	Implement the function F=X'Y+YZ'+XZ using PLA.	7 Marks	L2	CO5	PO3
		(OR)				
10.	a)	Design a PLA based logic circuit for F = A'C+AC'+BC and G = A'BC'+AB+AC.	7 Marks	L2	CO5	PO5
	b)	Realize the operation of 3-bit Binary to Gray code converter using PAL.	7 Marks	L3	CO5	PO5

❀ ❀ ❀

CODE No.: 20BT30501 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Regular Examinations March – 2022

COMPUTER ORGANIZATION

[Computer Science and Engineering, Computer Science and Systems Engineering, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Science), Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Convert the following decimal numbers to the binary 1231; 673; and 1998.	7 Marks	L3	CO1	PO1
	b)	Describe fixed point representation with examples.	7 Marks	L2	CO1	PO1
		(OR)				
2.		Classify various categories of micro operations and explain each one with examples.	14 Marks	L4	CO3	PO3
		UNIT-II				
3.	a)	Describe any four addressing modes with examples.	7 Marks	L2	CO2	PO1
	b)	Discuss computer instruction in detail.	7 Marks	L2	CO2	PO2
		(OR)				
4.	a)	Explain various phases of instruction cycle.	7 Marks	L2	CO2	PO2
	b)	Demonstrate interrupt cycle with relevant figure.	7 Marks	L2	CO2	PO2
		UNIT-III				
5.	a)	Illustrate micro programmed control organization with figure.	7 Marks	L3	CO2	PO1
	b)	Describe address sequencing in detail.	7 Marks	L2	CO2	PO1
		(OR)				
6.	a)	Explain various modes of data transfer to and from peripherals.	7 Marks	L2	CO4	PO1
	b)	Discuss daisy chaining priority interrupt with figure.	7 Marks	L2	CO4	PO2
		UNIT-IV				
7.	a)	Analyze synchronous and asynchronous DRAMs.	7 Marks	L4	CO4	PO1
	b)	Discuss Read only memories in detail.	7 Marks	L2	CO4	PO1
		(OR)				
8.	a)	Explain mapping functions of cache memories.	7 Marks	L2	CO2	PO1
	b)	Describe nonvolatile solid state memory technologies.	7 Marks	L2	CO2	PO2
		UNIT-V				
9.		Illustrate attached array processor and SIMD array processor in detail.	14 Marks	L3	CO4	PO1
		(OR)				
10.	a)	Discuss interconnection structures in detail.	7 Marks	L2	CO4	PO1
	b)	Describe hardware and software performance issues of multicore computers.	7 Marks	L2	CO4	PO2

CODE No.: 20BT30502 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Regular Examinations March – 2022

DATA STRUCTURES

[Computer Science and Engineering, Information Technology, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Science)]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	What is Data Structure and applications of Data Structures in Real time Computations.	7 Marks	L2	CO1	PO1 PO2
	b)	Discuss about Non-linear Data Structure in detail.	7 Marks	L2	CO1	PO1 PO2
		(OR)				
2.	a)	What is asymptotic time complexity and evaluate the process to add an element in the linked list.	7 Marks	L2	CO1	PO1 PO2
	b)	Explain Sorting process and operations involved in Linked list with example.	7 Marks	L3	CO1	PO1 PO2
		UNIT-II				
3.	a)	Showcase the Stack for evaluating arithmetic operations.	7 Marks	L2	CO1	PO1 PO2 PO3
	b)	Differentiate Circular Queues and Doubly ended Queues with example.	7 Marks	L3	CO4	PO1 PO2 PO3
		(OR)				
4.	a)	Discuss the advantages of Heap over Stack with detail operations.	7 Marks	L3	CO1	PO1 PO2 PO3
	b)	Explain the parsing of arithmetic expression for the following (A-B)*[C/(D+E)+F] with example.	7 Marks	L3	CO1	PO1 PO2 PO3
		UNIT-III				
5.	a)	Explain how binary search tree works with an example.	7 Marks	L2	CO2	PO1 PO2 PO3
	b)	Explain the complexity of AVL Tree in the context of Space, Search, insert and delete operations.	7 Marks	L2	CO2	PO1 PO2 PO3
		(OR)				
6.	a)	Explain the process of finding maximum and minimum element in binary tree without using recursion procedure.	7 Marks	L2	CO4	PO1 PO2 PO3
	b)	Differentiate AVL and Red Black tree related to Balance factor, Insertion, Deletion, and Faster lookup.	7 Marks	L3	CO2	PO1 PO2 PO3

UNIT-IV

7.	a)	Explain sequential search algorithm process for the following list of elements in array70, 40, 30, 11, 57, 41, 25, 14, 52. The search element k = 41.	7 Marks	L3	CO3	PO1 PO2
	b)	Explain Bubble sort algorithm for the given elements [5, 1, 4, 2, 8] and showcase the operations in Three Pass.	7 Marks	L3	CO3	PO1 PO2
		(OR)				
8.	a)	Explain the time and space complexity of shell shot algorithm in detail.	7 Marks	L2	CO3	PO1 PO2
	b)	Explain the time and space complexity of Quick sort algorithm in detail.	7 Marks	L2	CO3	PO1 PO2

UNIT-V

9.	a)	Differentiate Direct Graph and Un-Directed weighted Graph with examples.	7 Marks	L4	CO4	PO1 PO2
	b)	Point out the Pros and Cons of Breadth first search and Depth first search.	7 Marks	L3	CO2	PO1 PO2
		(OR)				
10.	a)	Define Hash function. Write a procedure in search and insertion of element through separate chaining.	7 Marks	L3	CO2	PO1 PO2
	b)	Explain Hashing efficiency and differentiate Random and Non-Random Keys.	7 Marks	L2	CO2	PO1 PO2

CODE No.: 20BT30503 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Regular Examinations March – 2022

PYTHON PROGRAMMING

[Computer Science and Engineering, Computer Science and Engineering (Artificial Intelligence), Computer Science and Engineering (Data Science)]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Summarize various operators, built-in functions and standard library modules that deal with Python's numeric type.	7 Marks	L2	CO1	PO1
	b)	Explain about keywords used in Python.	7 Marks	L2	CO1	PO1
		(OR)				
2.	a)	What are different applications of Python? Give examples.	7 Marks	L2	CO1	PO1
	b)	Construct a simple program in python to print greatest number in given three numbers.	7 Marks	L3	CO1	PO1
		UNIT-II				
3.	a)	What is iterative control statement? Write a Python program to print all prime numbers less than 256 using while statement.	7 Marks	L2	CO2	PO2
	b)	Develop a Python program that interchanges the first and last characters of a given string.	7 Marks	L3	CO2	PO4
		(OR)				
4.	a)	Construct a python script to print fallowing pattern. 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	7 Marks	L3	CO2	PO2
	b)	Write a Python program that prints multiplication table of a given number.	7 Marks	L3	CO2	PO1
		UNIT-III				
5.	a)	Develop a Python program that counts the number of occurrences of a letter in a string, using dictionaries.	7 Marks	L3	CO3	PO4
	b)	Explain briefly about Sequence in python. Write operations with suitable examples.	7 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Provide a comparison between lists, tuples, dictionaries and sets and explain with example.	7 Marks	L2	CO3	PO1
	b)	Discuss in detail about Quantifiers in regular expressions.	7 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	Write about different types of arguments in a function provide suitable examples.	7 Marks	L3	CO4	PO3
	b)	Construct a program to open and read a text file and displays how many lines and paragraphs in the given file.	7 Marks	L3	CO4	PO2
		(OR)				
8.	a)	Develop a Python program to open a file and check what are the access permissions acquired by that file using OS module.	7 Marks	L3	CO4	PO3
	b)	Construct a Python program to implement towers of Hanoi problem.	7 Marks	L3	CO4	PO2

UNIT-V

9.	a)	Develop a python program to call data member and function using classes and objects.	7 Marks	L3	CO5	PO4
	b)	Differentiate between compile-time and run-time polymorphism.	7 Marks	L2	CO5	PO1

(OR)

10.	a)	Write about Errors and Exception Handling in Python programming.	7 Marks	L2	CO5	PO1
	b)	How to handle an exception using try except block? Explain with the help of a program.	7 Marks	L2	CO5	PO1

CODE No.: 20BT31001 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Regular Examinations March – 2022

ELECTRICAL AND ELECTRONIC MEASUREMENTS

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the working of the PMMC instrument with a labeled sketch.	7 Marks	L2	CO1	PO1
	b)	Write about multi-range voltmeters and multi-range ammeters in detail.	7 Marks	L1	CO1	PO2
		(OR)				
2.	a)	Describe the procedure used to extend the range of the DC ammeter and DC voltmeter using shunts and multipliers.	7 Marks	L1	CO1	PO1
	b)	With the help of a neat sketch, explain the working of a true RMS voltmeter.	7 Marks	L2	CO1	PO2

UNIT-II

3.	a)	What are the problems associated with an ac potentiometer? Describe the working of any one ac potentiometer with a neat sketch.	7 Marks	L1	CO2	PO2
	b)	A coordinate type potentiometer is used for the determination of a coil and the results obtained are: Voltage across a 1.0Ω resistor in series with the coil is +0.238V on in-phase dial and -0.085V on quadratic dial. The voltage across a 10:1 potential divider used with the coil is +0.3375V on in-phase dial and +0.232V on the quadratic dial. Calculate the resistance and reactance of the coil.	7 Marks	L2	CO2	PO2
		(OR)				
4.	a)	Draw the circuit diagram of a Crompton's potentiometer and explain its working. Describe the steps used when measuring an unknown resistance.	7 Marks	L2	CO2	PO2
	b)	Explain the term standardization of a potentiometer. Describe the procedure of standardization of dc and ac potentiometers.	7 Marks	L1	CO2	PO2

UNIT-III

5.	a)	Derive the equation for average power over a cycle. Prove that it can be measured by an electrodynamometer type of wattmeter.	7 Marks	L2	CO3	PO2
	b)	Describe the working of a single-phase induction type energy meter. Show that the total number of revolutions made by its disc during a particular time is proportional to the energy consumed.	7 Marks	L1	CO3	PO1
		(OR)				
6.	a)	A dynamometer-type wattmeter with its voltage coil connected across the load side of the instrument reads 250 watts. If the load voltage be 200 volts, what power is being taken by load? The voltage coil branch has a resistance of 2000Ω.	7 Marks	L2	CO3	PO2
	b)	Describe the working of a single-phase electro dynamic power factor meter. Compare its working with a moving iron type power factor meter.	7 Marks	L1	CO3	PO1

UNIT-IV

7.	a)	What are the different difficulties encountered in the measurement of high resistance? Explain how these difficulties are overcome.	7 Marks	L1	CO4	PO1
	b)	Describe the working of Kelvin double bridge for measurement of low resistance. Derive the equations for balance condition.	7 Marks	L2	CO4	PO2
		(OR)				
8.	a)	Describe how an unknown capacitance can be measured with the help of D'Sauty's bridge. What are the limitations of this bridge and how are they overcome by using modified D'Sauty's bridge?	7 Marks	L2	CO4	PO2
	b)	The four arms of a Wheatstone bridge are as follows: AB=100 Ω; BC=1000 Ω; CD=4000 Ω; and DA=400 Ω. The galvanometer has a resistance of 100 Ω, a sensitivity of 100 mm/μA, and is connected across AC. A source of 4Vd.c is connected across BD. Calculate the current through the galvanometer and its deflection if the resistance of arm DA is changed from 400 Ω to 401 Ω.	7 Marks	L3	CO4	PO2

UNIT-V

9.	a)	Draw and explain the simplified composite circuit for the digital frequency meter.	7 Marks	L2	CO5	PO1
	b)	What is the purpose of a universal counter-timer? Explain.	7 Marks	L1	CO5	PO2
		(OR)				
10.	a)	Draw and explain the frequency synthesizer with a neat sketch.	7 Marks	L2	CO5	PO2
	b)	Explain the basic circuit of the digital frequency meter with a neat block diagram.	7 Marks	L1	CO5	PO1

❀ ❀ ❀

CODE No.: 20BT31002 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Regular Examinations March – 2022

TRANSDUCERS IN INSTRUMENTATION

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Outline the desirable static characteristics of transducers.	7 Marks	L2	CO1	PO1
	b)	Discuss the generalized measurement system with a neat sketch.	7 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Explain the dynamic characteristics of transducers	7 Marks	L2	CO1	PO2
	b)	The following 10 observations were recorded when measuring voltage. 7.92, 8.03, 8.10, 7.95, 8.01, 7.98, 7.95, 8.07, 7.94, 7.97 volts. Calculate Arithmetic mean, Standard deviation and Variance.	7 Marks	L3	CO1	PO3

UNIT-II

3.	a)	Explain the working principle and applications of the Hall effect transducers.	7 Marks	L2	CO2	PO1
	b)	Illustrate the construction and working of Bonded and unbounded strain gauges.	7 Marks	L4	CO2	PO2
		(OR)				
4.	a)	Derive the strain and gauge factor of strain gauges.	7 Marks	L3	CO2	PO2
	b)	Outline the principle of different capacitive transducers with neat diagrams.	7 Marks	L2	CO2	PO2

UNIT-III

5.	a)	Explain the construction and working principle of RTD.	7 Marks	L2	CO3	PO1
	b)	Discuss the different types of IC temperature sensors with neat sketches.	7 Marks	L2	CO3	PO2
		(OR)				
6.	a)	Explain any one type of pyrometer with necessary diagrams.	7 Marks	L2	CO3	PO2
	b)	Identify a suitable temperature measuring device with positive temperature co-efficient and explain its working principle.	7 Marks	L3	CO3	PO3

UNIT-IV

7.	a)	Compare the performance of Stroboscope with other velocity measuring techniques.	7 Marks	L4	CO4	PO4
	b)	Outline different techniques for measurement of torque.	7 Marks	L2	CO4	PO2
		(OR)				
8.	a)	Discuss the working of principle of piezoelectric accelerometer.	7 Marks	L2	CO4	PO1
	b)	Identify suitable load cell for measurement of force that is non-contact type. Justify sensor selection.	7 Marks	L3	CO4	PO5

UNIT-V

9.	a)	Identify suitable encoder for measurement of position with detailed explanation.	7 Marks	L3	CO5	PO3
	b)	Outline the principle of Smart sensor with neat diagram.	7 Marks	L2	CO5	PO2
		(OR)				
10.	a)	Explain the principle and working of SAW sensor with neat sketch.	7 Marks	L2	CO5	PO1
	b)	Discuss different vibration sensors with necessary diagrams.	7 Marks	L2	CO5	PO2

❀ ❀ ❀

CODE No.: 20BT31201 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Regular Examinations March – 2022

SOFTWARE ENGINEERING

[Information Technology, Computer Science and Systems Engineering, Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	List out various characteristics of Software and explain in detail.	7 Marks	L2	CO1	PO2
	b)	Discuss in detail, various phases of the Unified process.	7 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Explain briefly the different categories of computer software available today. And also describe the recent challenges faced by it.	7 Marks	L2	CO1	PO2
	b)	With help of a diagram, discuss in detail the water fall model. Give certain reasons for its failure.	7 Marks	L1	CO1	PO3
		UNIT-II				
3.	a)	Discuss in detail the non-functional requirements of software.	7 Marks	L1	CO2	PO2
	b)	Define Software verification and validation and write short notes about user requirements.	7 Marks	L2	CO2	PO2
		(OR)				
4.	a)	Explain the requirement engineering process with help of a diagram.	7 Marks	L1	CO2	PO2
	b)	Illustrate the requirement elicitation and analysis process with neat sketch.	7 Marks	L2	CO2	PO3
		UNIT-III				
5.	a)	Give few characteristics of Good Design.	7 Marks	L1	CO3	PO3
	b)	Define software architecture. Describe its importance.	7 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Explain Data Flow architecture style with diagram.	7 Marks	L1	CO3	PO2
	b)	Write short notes on software measurement. And list out software metrics.	7 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	List out the Strategic Issues of Software testing.	7 Marks	L1	CO4	PO1
	b)	Compare and Contrast White Box and Black Box Testing.	7 Marks	L2	CO4	PO1
		(OR)				
8.	a)	Sketch how testing strategy is represented in spiral model and explain.	7 Marks	L2	CO4	PO1
	b)	Explain in detail Basis path testing in White Box Testing Technique.	7 Marks	L1	CO4	PO1
		UNIT-V				
9.	a)	List out and illustrate, what types of risks are likely to encounter during software development.	7 Marks	L2	CO5	PO2
	b)	Explain Business Process Reengineering (BPR) model activities in detail.	7 Marks	L1	CO5	PO2
		(OR)				
10.	a)	Write a short note on Risk Refinement.	7 Marks	L2	CO5	PO6
	b)	What is Formal Technical Reviews? Discuss in detail about Formal Technical Review (FTR) performed by Software Engineers.	7 Marks	L1	CO5	PO2

CODE No.: 20BT31501 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Regular Examinations March – 2022

OPERATING SYSTEMS

[Computer Science and Systems Engineering, Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain different services of an Operating System.	7 Marks	L2	CO1	PO1
	b)	Explain in detail about context switching.	7 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Consider the set of processes that arrive at time 0 with the length of the CPU burst time given in milliseconds.	7 Marks	L3	CO1	PO2

Process	Burst Time
P1	4
P2	6
P3	5
P4	8
P5	3

Draw the Ganttchart using FCFS and Round Robin scheduling algorithm. Calculate the average waiting time in both cases. (Take time quantum = 4ms).
Analyze which of the algorithms result in minimum average waiting time.

	b)	Does preemptive scheduling give same performance as non-preemptive scheduling algorithm? Compare their performance by assuming at least 5 processes arrived at different time intervals.	7 Marks	L3	CO1	PO1

UNIT-II

3.	a)	Discuss how Peterson's solution can address the critical section problem.	7 Marks	L2	CO2	PO2
	b)	What is semaphore? Explain its implementation as wait and signal for providing process synchronization.	7 Marks	L2	CO2	PO3
		(OR)				
4.	a)	Define Deadlock. What are the necessary and sufficient conditions needed to be satisfied for deadlock to occur?	7 Marks	L2	CO2	PO2
	b)	Write and explain the solution for Reader-Writer classical synchronization problem using monitors.	7 Marks	L4	CO2	PO2

UNIT-III

5.	a)	Discuss Paging with an example.	7 Marks	L2	CO3	PO2
	b)	Consider the following page reference string 1, 2, 3, 4, 5, 2, 6, 7, 3, 2, 4, 1, 7, 1, 4, 3, 2, 3, 4, 7, 1. Compare the number of page faults with frame sizes 3, 4 and 5 with any replacement algorithm.	7 Marks	L4	CO3	PO2
		(OR)				
6.	a)	What is Belady's Anomaly? Explain with an example.	7 Marks	L2	CO3	PO2
	b)	Define Virtual Memory. Explain the process of converting virtual addresses to physical addresses with a neat diagram.	7 Marks	L2	CO3	PO2

UNIT-IV

7.	a)	Discuss the different file allocation methods with suitable example.	7 Marks	L2	CO2	PO2
	b)	A disk drive has 200 cylinders, numbered 0 to 199. The drive is currently serving a request at cylinder 53. The queue of pending requests, in FIFO order, is 98, 183, 37, 122, 14, 124, 65, 67. Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests for each of the following disk-scheduling algorithms? i) SCAN. ii) LOOK. iii) C-SCAN.	7 Marks	L4	CO2	PO2
		(OR)				
8.	a)	Compare and contrast free space management and swap space management.	7 Marks	L4	CO4	PO2
	b)	Explain DMA and Memory mapped I/O	7 Marks	L2	CO4	PO2

UNIT-V

9.	a)	Explain access matrices along with its implementation.	7 Marks	L2	CO1	PO2
	b)	Explain the process of revocation of access rights.	7 Marks	L2	CO5	PO2
		(OR)				
10.	a)	Compare Symmetric and Asymmetric Encryption.	7 Marks	L 4	CO6	PO2
	b)	Explain System and Network Threats.	7 Marks	L 2	CO6	PO2

CODE No.: 20BT31501 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Regular Examinations March – 2022

OPERATING SYSTEMS

[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Differentiate multiprogramming and time sharing.	7 Marks	L4	CO1	PO1
	b)	State and explain different operating system services.	7 Marks	L2	CO1	PO1

(OR)

2.	a)	Consider the following set of processes with the length of CPU burst time in milliseconds. The processes are arrive at time 0. What is the turnaround time and waiting time of each process for Round Robin scheduling with time quantum 3 and for FCFS?	9 Marks	L3	CO1	PO4

Process	Burst Time
P1	6
P2	8
P3	5
P4	2
P5	9

	b)	Discuss multithreading models.	5 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Discuss various approaches to solve the critical section problem.	7 Marks	L2	CO2	PO2
	b)	Explain Dining Philosopher's problem and its solution using the concept of semaphores.	7 Marks	L2	CO2	PO2

(OR)

4.	a)	Illustrate how semaphore acts as a synchronization tool. CO2 PO2.	5 Marks	L2	CO2	PO2
	b)	Consider the current state of the system with 4 processes and 3 resource types. There are 3 units of type A, 2 units of type B and 2 units of type C still available. Detect whether the system is in a safe state or not.	9 Marks	L3	CO3	PO4

Process	Allocation			Request		
P1	A	B	C	A	B	C
P2	0	0	1	10	4	2
P3	3	2	0	3	0	0
P4	2	1	1	1	2	2
P5	1	1	2	8	2	2

UNIT-III

5.	a)	A disk has 200 tracks (numbered 0 through 199). The R/W head is currently servicing at cylinder 120. The queue of pending requests is in order: 30, 70, 115, 110, 80, 20 and 25. Starting from the current head position, what is the total distance travelled (in cylinders) by the disk arm to satisfy the requests using algorithms SSTF, FCFS, LOOK and SCAN. (Illustrate with figure in each case).	9 Marks	L3	CO4	PO2
	b)	Explain about Thrashing in detail.	5 Marks	L2	CO4	PO1

(OR)

6.	a)	Explain basic steps in handling a page fault with neat diagram.	7 Marks	L2	CO4	PO2
	b)	What is Demand paging? How to implement it?	7 Marks	L1	CO4	PO2

UNIT-IV

7.	a)	What are the attributes of a File? Write different operations that can be performed on a File.	7 Marks	L1	CO5	PO1
	b)	Explain the file system and directory implementation with the help of necessary diagrams.	7 Marks	L2	CO5	PO2

(OR)

8.	a)	Discuss Kernel I/O subsystem.	7 Marks	L2	CO6	PO1
	b)	What are the directories? List different types of directory structures with an example. List their advantages and disadvantages.	7 Marks	L1	CO6	PO1

UNIT-V

9.	a)	What are access matrices? Explain its implementation.	7 Marks	L2	CO6	PO1
	b)	Write about Access control.	7 Marks	L1	CO6	PO1

(OR)

10.	a)	Write about Symmetric and Asymmetric encryption.	7 Marks	L1	CO6	PO1
	b)	Explain Firewalling to protect Systems and Networks.	7 Marks	L2	CO6	PO1

CODE No.: 20BT50502 **SVEC-20**

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-20) Regular Examinations March – 2022

DESIGN AND ANALYSIS OF ALGORTIHMS

[Computer Science and Business Systems]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Distinguish between Recursive algorithm and Non-Recursive algorithm with an example.	7 Marks	L2	CO1	PO2
	b)	State the Masters theorem for solving recurrence relation. Apply the Masters theorem to solve the following recurrence relation: $T(n) = 9T(n/3) + n$.	7 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Design an algorithm to perform Binary search and compute its running time complexity.	7 Marks	L2	CO1	PO2

	b)	Explain the space and time complexity of the following algorithm.
		Algorithm Sample(n)
		{a = 0;
		for (i = 0; i <n; i++)
		{
		for (j = n; j > i; j--)
		{
		a = a + i + j;
		}
		}
		}
			7 Marks	L2	CO1	PO2

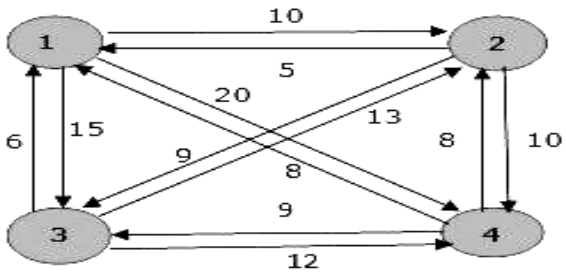
UNIT-II

3.		Sort the following elements 62, 71, 88, 93, 12, 14, 56, 75, 89, 23, 55, 12, 66, 87, 54, 11, 33, 42, 77 and 7 using merge sort. Show the order of elements after completion of final pass.	14 Marks	L2	CO2	PO3
		(OR)				
4.		Generally matrix multiplication is possible in O(n^3) Multiply the following matrices in less than O(n^3). Consider the following matrices and explain step by step procedure to find the multiplication. A=[1 1 1 1, 1 1 1 1, 1 1 1 1, 1 1 1 1] and B=[1 0 0 0, 0 1 0 0, 0 0 1 0, 0 0 0 1]	14 Marks	L3	CO3	PO2

UNIT-III

5.	a)	Solve the optimal binary search tree for the following words, where the frequency of occurrence is in parentheses: be (0.28), for(0.29), I(0.33), he(0.32), of(0.19).	10 Marks	L2	CO3	PO3
	b)	Dynamic Programming is a bottom up approach. Justify your answer with suitable example.	4 Marks	L2	CO3	PO1
		(OR)				

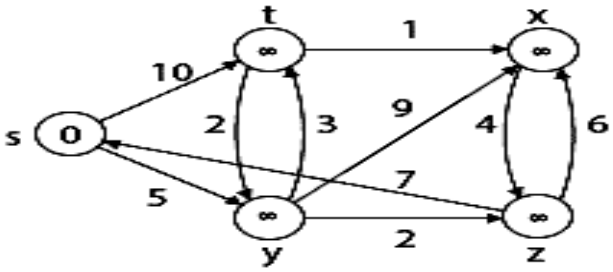
6.	a)	Apply Dynamic Programming to find the minimum cost tour for TSP.	8 Marks	L2	CO3	PO2



	b)	State the principal of Optimality, compare and contrast Greedy and Dynamic programming methods.	6 Marks	L2	CO2	PO2

UNIT-IV

7.	a)	Demonstrate greedy method to solve single source shortest path for the following graph (source vertex is 0) .	10 Marks	L2	CO3	PO2



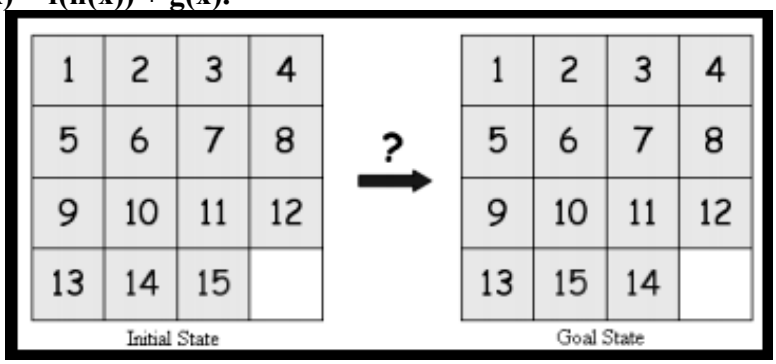
	b)	State and explain the approach of Job sequencing with deadlines using Greedy Approach.	4 Marks	L2	CO3	PO1

(OR)

8.		Solve the following instance of 0/1 knapsack problem using Backtracking when P={40, 30, 50, 10} W={2, 5, 10, 5} and m=16.	14 Marks	L3	CO3	PO2

UNIT-V

9.		Check whether the goal state is achieved from initial state given below using LC branch and bound method by using **$\hat{c}(x) = f(h(x)) + \hat{g}(x)$.**	14 Marks	L3	CO3	PO3



(OR)

10.	a)	Identify the differences between deterministic and non deterministic algorithm with an example.	10 Marks	L3	CO4	PO2
	b)	Explain about satisfiability in NP Problems.	4 Marks	L2	CO4	PO1

CODE No.:10BT40301 SVEC-10

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC10) Supplementary Examinations March - 2021

KINEMATICS OF MACHINERY

[Mechanical Engineering]

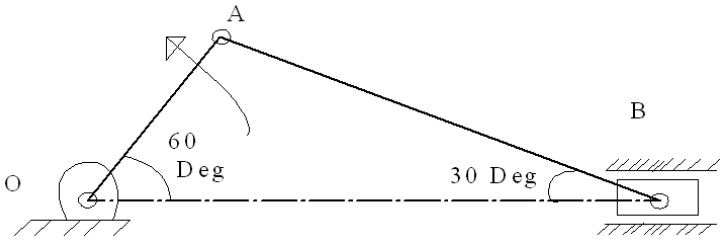
Time: 3 hours **Max. Marks: 70**

Answer any FIVE questions
All questions carry equal marks

1. a) What is meant by inversion of a mechanism? Describe with the help of suitable sketches the inversion of four bar mechanism.
b) How is the mechanism of higher pair can be replaced by the mechanism of lower pair?

2. a) Derive an expression for the ratio of shaft velocities for hooks joint and draw the polar diagram depicting the salient features of driven shaft speed.
b) Define any one of the approximate straight line motion mechanism with example.

3. For the configuration of a slider crank mechanism shown in fig, find
i) The acceleration of slider at B, ii) The angular acceleration of link AB
The crank rotates at 20rad/sec counterclockwise
Given: OA = 480mm; AB=1600mm;AE=450mm



4. Derive an expression for the ratio of shafts velocities for Hooke's joint and draw the polar diagram depicting the salient features of driven shaft speed.

5. A Cam is to be designed for a roller follower with the following data:
i) Cam lift =40mm during 90 deg of cam rotation with SHM
ii) Dwell for the next 30deg
iii) During the next 60deg of cam rotation, the follower returns to its original position with SHM
iv) Dwell during remaining 180deg

Draw the profile of the cam when the line of stroke of the follower passes through the axis of the cam shaft .The radius of the base circle of the cam is 40mm.Determine the maximum velocity and acceleration of the follower during its ascent and descent , if the cam rotates at 240rpm.

6. a) Define : i) Addendum ii) Total Depth
b) State and prove the fundamental Law of gearing with neat sketch?

7. a) Derive an expression for centrifugal tension in belt drive.
b) A leather belt is required to transmit 8 kW from a pulley 1.5 m diameter running at 240 rpm. The angle of contact is 160^0C and the coefficient of friction between belt and pulley is 0.25. The safe working stress for the belt is 1.5 MPa, and density of the belt material is 1000 kg/m^3 determine the width of the belt if its thickness is 10 mm. The effect of centrifugal tension is to be taken into account?

8. a) What is an epicyclic gear train? In what manner does it differ from a simple or compound gear train?

b) A compound gear train consists of six gears. The number of teeth on each gear is as follows:

Gear	A	B	C	D	E	F
No. of teeth	60	40	50	25	30	24

Determine i) speed of the output shaft ii) output torque iii) holding torque.

CODE No.:14BT40101 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations August – 2021

STRUCTURAL ANALYSIS - I
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Derive the expressions for finding out principal stresses, principal planes and maximum shear stress of a shaft under both B.M and Torque. 14 Marks

(OR)

2 At a point in material under stress, the intensity of the resultant stress on a certain plane is 60 Mpa(Tensile) inclined at 30° to the normal of that plane. The stress on a plane at right angles to this has a normal tensile component of intensity 40 Mpa(Tensile). Find: 14 Marks

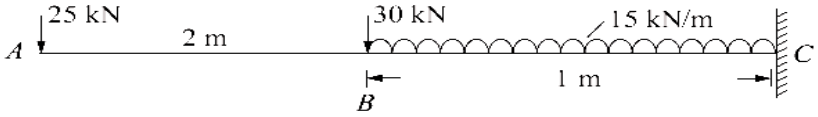
i) The Principal planes and Principal stresses.
ii) The planes of maximum Shear and its magnitude.
iii) Resultant stress on the plane on which 40 MPa stress is acting.

UNIT-II

3 A cantilever beam of length 7m, carries a point load at a distance of 4m from the fixed end. Find the deflection and slope under the point load and at the free end using Macaulay's method. Take E = 2.1×10^5 MPa and I = 86×10^6 mm^4. 14 Marks

(OR)

4 Compute the maximum slope and deflection for the beam shown in figure, using Moment-Area method. *EI*=16,000 kNm^2. 14 Marks



UNIT-III

5 What are the assumptions made in the Euler's theory? Derive the critical load formula for a long column with both the ends as fixed. 14 Marks

(OR)

6 A 5m long circular column having fixed ends has 240mm external diameter and 20mm thickness. The column carries a load of 160 kN at an eccentricity of 25mm from its longitudinal axis. Determine (i) stresses in the extreme fibres of the cross-section and (ii) maximum eccentricity so as to have no tension anywhere in its cross section. The modulus of elasticity of the material is 82 GPa. 14 Marks

UNIT-IV

7 A fixed beam ABC carries a u.d.l of 5kN/m over the entire span and a point load of 5kN at B. If AB= BC=2m and EI = 2000 kN-m^2, find the fixing moments and the maximum deflection. Also draw the S.F and B.M diagrams. 14 Marks

(OR)

8 A continuous beam ABC is simply supported at A, B and C. It carries a central point load of 10 kN on the span AB and a central clockwise moment of 10 kN.m at midspan of BC. If AB = 4m and BC = 6m, draw the S.F and B.M diagrams. 14 Marks

UNIT-V

9	a)	Derive an expression for Distortional strain energy per unit volume in terms three principal stresses.	7 Marks
	b)	Design the diameter of a circular shaft subjected to combined bending and twisting with bending moment of 10kN.m and twisting moment of 28kN.m. The safe stress in direct tension is 250MPa and μ=0.3.	7 Marks

(OR)

10	a)	What is Shear centre? Write the short note on Shear centre.	7 Marks
	b)	A channel section has flanges of size 10cm x 10cm and web size of 2cm x 14cm. Determine the shear centre of the channel section.	7 Marks

CODE No.:14BT40104 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations August - 2021

FLUID MECHANICS - II

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) A flat plate 1.5mx1.5m moves at 45 kmph in stationary air of specific weight 11.3N/m^3. If the coefficients of drag and lift are 0.15 and 0.75 respectively, find lift force, drag force and resultant force. 7 Marks

b) Define displacement, momentum and energy thicknesses. 7 Marks

(OR)

2 Find the displacement thickness, the momentum thickness and energy thickness for the velocity distribution in the boundary layer given by $u/U=2(y/\delta) - (y/\delta)^2$. 14 Marks

UNIT-II

3 Derive the conditions for the rectangular channel of the best section and find the critical depth and critical velocity of the water flowing through a rectangular channel of width 5m, when discharge is 15 m^3/s. 14 Marks

(OR)

4 Explain the concept of hydraulic jump with a neat sketch and hydraulic jump forms at the downstream end of spillway causing 18 cumec discharges. If the depth before jump is 0.8 m, determine the depth after the jump and energy loss. 14 Marks

UNIT-III

5 Obtain an expression for the force exerted by a jet of water on an inclined fixed plate in the direction of the jet and a jet of water of diameter 50mm moving with a velocity of 40m/s, strikes a curved fixed symmetrical plane at the centre. Find the force exerted by the jet of water in the direction of the jet, if the jet is defected through an angle of 120° at the outlet of the curved plate. 14 Marks

(OR)

6 a) Derive the expression for force exerted by a jet on a stationary vertical plate. 7 Marks

b) Water is flowing through a pipe at the end of which a nozzle is fitted. The diameter of the nozzle is 120mm and the head of water at the centre nozzle is 100m. Find the force exerted by the jet of water on a fixed vertical plate. The co-efficient of velocity is given as 0.95. 7 Marks

UNIT-IV

7 Explain with a neat sketch of different components of a hydro power plant and a Pelton wheel has to design to develop 750 kw working under a head of 250m running at 800 r.p.m with overall efficiency of 85%. Take speed ratio as 0.45, coefficient of velocity 0.98, jet diameter to wheel diameter is 1/10. 14 Marks

(OR)

8 Give the classification of hydro power plants. 14 Marks

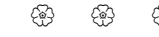
UNIT-V

9 a) What are all the losses that occur during the operation of a centrifugal pump? 7 Marks

b) Expand and explain the term NPSH. 7 Marks

(OR)

10 Explain with neat sketches the working procedures of : 14 Marks
i) Jet pump ii) Airlift pump.



CODE No.:14BT40203 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations August – 2021

ELECTRICAL AND ELECTRONIC MEASUREMENTS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the Static characteristics of instruments.	7 Marks
	b)	A voltmeter is accurate to 98% of its full-scale reading. i) If a voltmeter read 200V on 500V range, what is the absolute error? ii) What is the percentage error reading of part (i)?	7 Marks

(OR)

2	a)	Explain the construction and working of D'Arsonaval Galvanometer.	7 Marks
	b)	Explain the essential operating forces that occur on MI and MC type instruments.	7 Marks

UNIT-II

3	a)	Explain measurement of reactive power in three phase balanced and un-balanced loads.	7 Marks
	b)	Explain working principle of LPF Wattmeter.	7 Marks

(OR)

4	a)	Describe the constructional details of an Electrodynamometer type wattmeter and derive the expression for torque when the instrument is used on a.c.	7 Marks
	b)	Explain working principle of single phase energy meter with diagram.	7 Marks

UNIT-III

5	a)	Briefly describe CT and PT with diagrams.	7 Marks
	b)	Draw the equivalent circuit and phasor diagram of a current transformer and derive the expression for ratio and phase angle errors.	7 Marks

(OR)

6	a)	Briefly describe single phase Electro dynamo meter type power factor meter.	7 Marks
	b)	Explain the disadvantages of shunts and multipliers when used for extension of range. Explain how instrument transformers are a better substitute for shunts and multipliers especially for high range values.	7 Marks

UNIT-IV

7	a)	Explain the suitable bridge used for the measurement of high resistance.	7 Marks
	b)	Writ a short notes on Megger and Q-meter.	7 Marks

(OR)

8	a)	Derive the equations of balance for an Anderson's bridge. Draw the phasor diagram for conditions under balance.	8 Marks
	b)	Derive the equations of balance for Schering bridge. Draw the phasor diagram for under balance condition.	6 Marks

UNIT-V

9	a)	Explain the Lissajous Patterns for the measurement of Phase and Frequency.	8 Marks
	b)	List the Applications of Oscilloscopes.	6 Marks

(OR)

10		Write short notes on the following: i) Digital frequency meter. ii) Dual slope digital volt meter.	14 Marks

❀ ❀ ❀

CODE No.:14BT40204 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations August – 2021

TRANSFORMERS AND INDUCTION MACHINES
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	With relevant phasor diagrams, explain the operation of a single phase transformer operating on lagging and leading power factor loads.	8 Marks
	b)	Classify various types of transformers and explain them in brief.	6 Marks
		(OR)	
2	a)	Derive the EMF equation of a transformer. Hence derive transformation ratio.	7 Marks
	b)	Discuss the effect of variations of frequency and voltage on iron loss. How will you minimize the hysteresis and eddy current loss that occur in a practical transformer?	7 Marks

UNIT-II

3		With neat diagram, explain the various tests conducted on transformer to obtain its equivalent circuit. Derive all related equations.	14 Marks
		(OR)	
4	a)	Draw the vector diagrams of transformer at load with lagging and leading power factors.	6 Marks
	b)	Calculate the voltage regulation for a 200/400 V, 4 kVA transformer at full load and pf. 0.8 lagging with following test data: OC test: 200 V, 0.8 A, 70 W (LV side) SC test: 20 V, 10 A, 60 W (HV side)	8 Marks

UNIT-III

5	a)	What are the various three-phase transformer connections? Explain the star-star and star-delta connections with neat diagrams.	8 Marks
	b)	What is meant by Scott connection of transformers? Explain its significance and applications.	6 Marks
		(OR)	
6	a)	A three phase transformer has 400 turns on the primary and 40 turns on the secondary. The supply voltage is 3300V. Find the secondary voltage on no load when the windings are connected in (i) star-delta (ii) delta-star.	8 Marks
	b)	Explain the desirable conditions for the parallel operation of 3-phase transformers.	6 Marks

UNIT-IV

7	a)	Show that a three phase winding when excited by a three phase supply establishes a rotating magnetic field.	7 Marks
	b)	The full load power input to a 3-phase induction motor is 50Kw and the slip is 3%. Neglecting stator losses, calculate the full load **cu** losses and total mechanical power developed.	7 Marks
		(OR)	
8	a)	Compare slip-ring and squirrel-cage induction motor.	4 Marks
	b)	Explain air-gap power, internal mechanical power developed and shaft power. Deduce a relationship between them.	6 Marks
	c)	Derive the expression for maximum torque of three phase induction motor.	4 Marks

UNIT-V

9		Explain any two methods of speed control of a squirrel cage induction motor.	14 Marks
		(OR)	
10	a)	Explain auto transformer starting method of 3-phase induction motor.	7 Marks
	b)	The power input to a 3-phase induction motor is 60 KW. The stator losses are 1 KW. Find the mechanical power developed, and the rotor copper loss per phase if the motor is running with a slip of 3%.	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations August – 2021

ANALOG COMMUNICATIONS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Discuss the need for modulation.	6 Marks
	b)	An AM signal is of form: **$S(t)=10(1+0.5\cos 2000\pi t + 0.5\cos 4000\pi t)\cos(2\pi 10^6 t)$.** Sketch the amplitude spectrum and find Average power and Modulation Index.	8 Marks
		(OR)	
2	a)	Explain the generation of the AM signal with switching modulator.	7 Marks
	b)	With neat block diagram, explain principle and operation of Costas loop.	7 Marks

UNIT-II

3	a)	Compare various AM techniques with respect to transmitter power and band width.	6 Marks
	b)	Explain the generation of SSB wave using phase discriminator method.	8 Marks
		(OR)	
4	a)	Explain how VSB signal can be demodulated by envelop detector.	8 Marks
	b)	Why do you prefer VSB modulation scheme in TV signals.	6 Marks

UNIT-III

5	a)	Prove that narrow band FM offers no improvement in SNR over AM.	8 Marks
	b)	Evaluate the bandwidth requirement for the transmission of FM signal having a frequency deviation 75 KHz and an audio bandwidth of 10KHz.	6 Marks
		(OR)	
6	a)	Explain the detection of FM wave using balanced frequency discriminator	8 Marks
	b)	A single tone FM signal is given by **$x(t)=10\cos(16\pi 10^6 t+20\cos 2\pi 10^3 t)$ V**. Determine the modulation index, frequency deviation, BW and power associated.	6 Marks

UNIT-IV

7	a)	With a neat diagram, explain the operation of a Super heterodyne receiver.	7 Marks
	b)	Define the terms. i) Selectivity ii) Sensitivity with respect to a receiver. Also describe the notion of image frequency.	7 Marks
		(OR)	
8	a)	Write short notes on Preemphasis and Deemphasis in FM Modulation systems.	7 Marks
	b)	Derive the SNR in coherent detection and envelope detection of AM signals.	7 Marks

UNIT-V

9	a)	Explain the generation and demodulation of PPM with the help of block diagram and hence discuss its spectral characteristics.	8 Marks
	b)	What are the differences between PAM, PWM and PPM.	6 Marks
		(OR)	
10	a)	Differentiate different types of Pulse Modulation schemes.	7 Marks
	b)	Explain the generation and detection of PAM signals with neat schematics.	7 Marks

❀ ❀ ❀

CODE No.:14BT40402 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations August – 2021

ELECTRONIC CIRCUIT ANALYSIS AND DESIGN

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What do you mean by a multistage amplifier? Explain it briefly.	6 Marks
	b)	Draw the circuit diagram of a Darlington emitter follower and derive the expressions for its voltage gain and input resistance.	8 Marks
		(OR)	
2	a)	State the various methods of cascading transistor amplifiers.	7 Marks
	b)	With the help of a suitable circuit diagram, explain the working of a RC coupled amplifier	7 Marks

UNIT-II

3	a)	Explain the frequency response of amplifier at low and high frequencies.	7 Marks
	b)	Define F_T, $F\alpha$ and F_β and find relation between F_T and F_β.	7 Marks
		(OR)	
4	a)	Derive the expression for the voltage gain of a common drain FET amplifier.	7 Marks
	b)	Sketch the small signal high frequency circuit of CS amplifier and derive the expression for voltage gain.	7 Marks

UNIT-III

5	a)	With a neat sketch, explain the working of RC phase shift oscillator.	6 Marks
	b)	Draw the circuit diagram of a voltage series feedback amplifier and derive expressions for voltage gain with and without feedback.	8 Marks
		(OR)	
6	a)	Explain in detail about the different feedback topologies.	8 Marks
	b)	A transistor Colpitt's oscillator uses a tank circuit with L = 30mH, C_1 = 200PF and C_2 = 200PF. What is the frequency of oscillators?	6 Marks

UNIT-IV

7	a)	In what way the design features of power transistors different from small signal transistors?	7 Marks
	b)	What reasons will you assign for higher conversion efficiency of Class B-amplifier as compared to Class A -amplifier?	7 Marks
		(OR)	
8	a)	What do you understand by cross-over distortion? How can it be eliminated in Class B-operation?	6 Marks
	b)	Derive an expression for the efficiency of class A - power amplifiers.	8 Marks

UNIT-V

9	a)	Explain the working of a single-tuned amplifier.	6 Marks
	b)	Derive an expression for the resonance frequency of a parallel resonant circuit	8 Marks
		(OR)	
10	a)	Explain the working of a double-tuned amplifier.	7 Marks
	b)	Explain in brief, the function of the tank circuit in a tuned-voltage amplifier.	7 Marks

CODE No.:14BT40404 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations August - 2021

SIGNALS AND SYSTEMS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) A discrete-time system **s** described by the following input-output relation $y(n) = x^2(n)$. Is this system (i) static or dynamic and (ii) linear or non-linear? 7 Marks

b) Find the step response of an LTI system whose unit impulse response is given by $h(n) = (0.5)^n u(n)$. 7 Marks

(OR)

2 a) Find the convolution sum of sequences x(n) and $y(n)$ for n = 0, 3, 5 *and* 10 if $x(n) = (3/4)^n\, u(n)$ and $y(n) = u(n)$. 7 Marks

b) For what range of values of the parameter α are the systems defined by the following difference equations stable? $y(n) - a^2\, y(n-2) = x(n-3)$ 7 Marks

UNIT-II

3 a) Find Fourier Transform of the function $x(t) = e^{-3t}[u(t+2) - u(t-3)]$. 5 Marks

b) Prove frequency and time shifting properties of Fourier Transform. 9 Marks

(OR)

4 State and prove following properties of Fourier Transforms. 14 Marks

i) Convolution property. ii) Time shifting property.
iii) Differentiation property. iv) Integration property.

UNIT-III

5 a) Find the Auto-Correlation of f(t) = cos ($\omega_0 t$) and sketch. 7 Marks

b) Derive the relation between PSDs of input and output for an LTI system 7 Marks

(OR)

6 a) State and prove sampling theorem for band limited signals using analytical approach 8 Marks

b) Determine the Nyquist sampling rate and Nyquist sampling interval for the signals (i) sinc(100nt) . (ii) sinc(100nt) + sinc(50nt). 6 Marks

UNIT-IV

7 a) Find Laplace transforms and sketches their ROC of : 7 Marks

(i) x(t) = u(t-5). (ii) $x(t) = e^{j\omega t}u(t)$.

b) State and prove the following properties of Laplace transform. 7 Marks

(i) Convolution property. (ii) Time differentiation.

(OR)

8 a) Solve the second-order linear differential equation $\mathbf{y''(t) + 5y'(t) + 6y(t) = x(t)}$ with initial conditions $\mathbf{y(0) = 2, y'(0) = 1}$, and $\mathbf{x(t) = e^{-t}\, u(t).}$ 7 Marks

b) Find the inverse Laplace transform of $\mathbf{X(s) = (-5s-7)/(s+1)(s-1)(s+2)}$ 7 Marks

UNIT-V

9 a) Determine the z-transform of $x(n) = a^n u(n) - b^n u(-n-1)$ and find ROC. 7 Marks

b) The output y[n] of a discrete-time LTI system is found to be $2\,(1/3)^n\, u[n]$ when the input $x[n]$ is $u[n]$. Find the impulse response $h[n]$ of the system. 7 Marks

(OR)

10 a) Explain geometric evaluation of Fourier Transform from pole-zero plot. 7 Marks

b) Determine the signal x(n) whose z-transform is given by: 7 Marks

$X(z) = \log(1 - 1\, az^{-1};\ |z| > |a|$

❀ ❀ ❀

CODE No.:14BT40405 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations August – 2021

SWITCHING THEORY AND LOGIC DESIGN

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain Canonical and Standard forms with suitable examples.	6 Marks
	b)	Implement the INVERTER gate, OR gate and AND gate using: i) NAND gate. ii) NOR gate.	8 Marks
		(OR)	
2	a)	Explain basic laws of Boolean algebra with examples.	7 Marks
	b)	Simplify the expression **Z= AB'C' + AB'C + ABC** using Boolean laws.	7 Marks

UNIT-II

3	a)	Simplify following using K map **X= A'B+A'B'C+ABC'+AB'C'.**	7 Marks
	b)	Convert SOP to equivalent POS **A'B'C+A'BC+AB'C+ABC.**	7 Marks
		(OR)	
4	a)	Obtain the simplified expression in SOP form using K-map for the following Boolean function and draw logic circuit. $F(A, B, C, D) = \sum m(0,1,4,6,8,9,10,12) + \sum d(3,7,13,14,15)$	8 Marks
	b)	Show that the dual of the exclusive -OR is also its complement.	6 Marks

UNIT-III

5	a)	Design a combinational circuit for 4-bit Adder/Subtractor.	6 Marks
	b)	Design a BCD to Excess-3 code converter.	8 Marks
		(OR)	
6	a)	Implement a full adder circuit using 4x1 multiplexers	6 Marks
	b)	Explain about Encoder and Priority Encoder.	8 Marks

UNIT-IV

7	a)	Convert SR flip-flop to JK flip-flop.	7 Marks
	b)	Explain the operation of D flip-flop with logic diagram and truth table.	7 Marks
		(OR)	
8	a)	Design a decade asynchronous counter with timing diagrams.	8 Marks
	b)	Explain 4 bit Ring and Twisted ring counter with their truth tables.	6 Marks

UNIT-V

9	a)	Describe the design procedure for asynchronous sequential circuits.	6 Marks
	b)	Find a circuit that has no static hazards and the Boolean function $F(A, B, C, D) = \sum m(1, 3, 5, 7, 8, 9, 14, 15)$.	8 Marks
		(OR)	
10	a)	Explain the operation of debounce circuit with neat circuit diagram.	7 Marks
	b)	Find a circuit that has no static hazards and implements the Boolean function $F(A,B,C,D) = \sum(0,2,6\ 7,8,10,12)$.	7 Marks

CODE No.:14BT40431 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations August - 2021

ANALOG ELECTRONIC CIRCUITS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Synthesize A_I, A_V R_I and R_O for a single stage CE amplifier with un by passed emitter resistance, R_S=1KΩ, R_1=50KΩ, R_2=2KΩ, R_C=1KΩ, R_E=270Ω and R_L=1.2KΩ. The h-parameters given are h_{ie}=1100Ω and h_{fe}=50. 14 Marks

(OR)

2 Estimate g_m, $g_{b'e}$, c_e and ω_β for a transistor at I_C=1mA and V_{CE}=10V. The datasheet shows the values as C_C=3PF, h_{fe}=200, ω_T=500rad/sec. Formulate the expressions used. 14 Marks

UNIT-II

3 a) Draw the circuit diagram of voltage shunt feedback amplifier and derive expressions for voltage gain and feedback factor. 10 Marks

b) Explain the concept of feedback as applied to electronic amplifier circuit. What are the advantages and disadvantages of positive and negative feedback? 4 Marks

(OR)

4 a) Show that the gain of Wien bridge oscillator using BJT amplifier must be at least 3 for the oscillations to occur. 10 Marks

b) Explain the concept of feedback in oscillators. 4 Marks

UNIT-III

5 a) Derive the conversion efficiency of a Class-B amplifier. 7 Marks

b) Compute the effective load resistance R_L seen looking into the primary of 8**:**1 transformer connected to the output load of 20Ω. 7 Marks

(OR)

6 a) Distinguish between Class-A, Class-B and Class-AB amplifiers with neat diagrams. 7 Marks

b) Describe the second harmonic distortion in power amplifiers. 7 Marks

UNIT-IV

7 a) Explain how clipping at two independent levels can be achieved. 8 Marks

b) Explain positive peak voltage limiters below reference level. 6 Marks

(OR)

8 a) With relevant diagrams, explain various switching times of a transistor. 8 Marks

b) Design a transistor switch with the following specifications. 6 Marks
V_{CC}=10V; V_{BB}=6V; I_C(sat)=8mA; h_{FE}(min)=30.

UNIT-V

9 Draw the circuit diagram for Schmitt trigger and explain its operation. What are the applications of the above circuit? Derive the expressions for UTP and LTP. 14 Marks

(OR)

10 Describe Monostable multivibrator. Explain with the help of a neat circuit diagram the principle of operation of collector coupled monostable multivibrator, and derive an expression for gate width. Draw the waveforms at collector and base of both transistors. 14 Marks

CODE No.:14BT40432 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations August – 2021

DATA COMMUNICATIONS
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Write short notes on complex signals.	7 Marks
	b)	Describe relation between bit rate, bandwidth and baud for 16-PSK.	7 Marks
		(OR)	
2	a)	With a neat sketch, explain the components of a communication net work.	5 Marks
	b)	Define noise. Explain about Electrical noise and Signal to noise ratio.	9 Marks

UNIT-II

3	a)	Write short notes on plenum cables and coaxial transmission lines.	7 Marks
	b)	Discuss in detail about the classification of transmission lines and also list out the differences between STP and UTP transmission lines.	7 Marks
		(OR)	
4	a)	Write short nodes of different modes present in optical fibers.	7 Marks
	b)	List out advantages of optical fiber cables.	7 Marks

UNIT-III

5	a)	Explain single channel simplex PCM transmission system.	8 Marks
	b)	Estimate the line speed for a T1 digital carrier system.	6 Marks
		(OR)	
6	a)	With neat sketch, explain various digital line encoding formats.	7 Marks
	b)	Explain how statistical TDM is different from conventional TDM.	7 Marks

UNIT-IV

7	a)	Explain in detail about basic telephone call procedures.	7 Marks
	b)	Explain about working of caller ID when it is used.	7 Marks
		(OR)	
8	a)	Describe processes of C-message noise weighting and give its significance.	7 Marks
	b)	Discuss in detail about the conditions that are addressed by facility parameters.	7 Marks

UNIT-V

9	a)	Explain Cellular concept. Define Frequency Reuse mechanism and explain Cell Splitting with net sketches.	8 Marks
	b)	Write about different Hand-off mechanisms.	6 Marks
		(OR)	
10	a)	Explain in detail about cellular telephone network components.	7 Marks
	b)	Briefly describe AMPS cellular telephone system.	7 Marks

CODE No.:14BT41201 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations August – 2021

OBJECT ORIENTED PROGRAMMING
[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the difference between Procedure Oriented Programming and Object Oriented Programming with the help of suitable programs/code.	7 Marks
	b)	Write short notes on OOP concepts.	7 Marks
		(OR)	
2	a)	Explain the concept of Constructor with the help of suitable Java Program.	7 Marks
	b)	Explain the difference between a function in C Program and method in Java Program.	7 Marks

UNIT-II

3	a)	Write short note on the Costs and Substitutability of Inheritance.	7 Marks
	b)	Explain the Key word 'final' with suitable Java Program.	7 Marks
		(OR)	
4	a)	Explain the process of defining, creating and accessing a Package.	7 Marks
	b)	Discuss about CLASSPATH with the help of suitable Java Code.	7 Marks

UNIT-III

5	a)	Write a Java program to change the priority of a thread.	7 Marks
	b)	Explain the need for synchronizing threads. Demonstrate with a suitable program.	7 Marks
		(OR)	
6	a)	Explain the terms: "final", "finally", "finalize".	6 Marks
	b)	What is an exception? How exception can be handled in Java in different ways?	8 Marks

UNIT-IV

7	a)	Explain the life cycle of an Applet.	7 Marks
	b)	Write a Java program using Applets to display the cursor position by handling mouse events.	7 Marks
		(OR)	
8	a)	Explain the two ways of executing an Applet.	7 Marks
	b)	Design an Applet to play and stop music files.	7 Marks

UNIT-V

9	a)	Explain the life cycle of a servlet and the methods involved form its creation to destruction.	7 Marks
	b)	Write a program to connect to a database and retrieve all the data.	7 Marks
		(OR)	
10	a)	Write a sample source code structure of a servlet to print Hello World.	7 Marks
	b)	Explain different types of JDBC drivers.	7 Marks

CODE No.:14BT50201 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations August - 2021

CONTROL SYSTEMS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

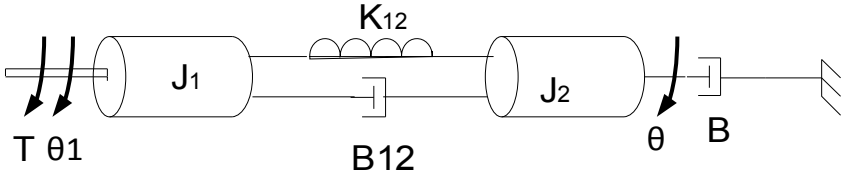
Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) What are the effects of feedback on Sensitivity and external noise? 7 Marks

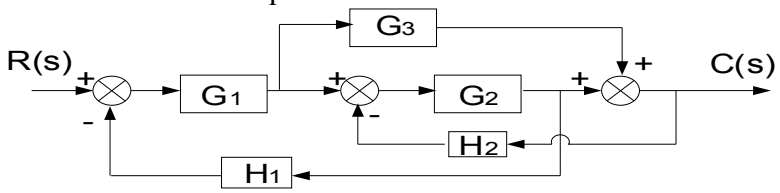
b) For the mechanical system, draw the electrical analogous circuits based on Torque-Voltage and Torque-Current analogy along their equations. 7 Marks



(OR)

2 a) Develop the block diagram for armature controlled DC motor. 7 Marks

b) Determine the overall transfer function for the system shown in the figure using block diagram reduction technique. 7 Marks



UNIT-II

3 a) Find K_p, K_v and K_a for the open-loop transfer function of a unity feedback system given by $G(s) = \frac{10}{s(0.1s+1)}$. 4 Marks

b) Derive the expressions for under damped second order system with unit step input. 10 Marks

(OR)

4 a) Discus the effect of P, PI, PD on control system characteristics. 6 Marks

b) Find the steady state error as a function of time for the unity feedback system G(s)= 100/s(1+0.1s), for the input r(t)=1+2t+(t^2/2). 8 Marks

UNIT-III

5 a) Determine the range of values of K such that the characteristic equation s^3 **+ 3(*K*+1)s^2 + (7*K*+5)*s*+(4*K*+7) = 0** has roots more negative than *s* = –1. 7 Marks

b) Explain about the effects of adding zeroes to G(s)H(s) on the root loci. 7 Marks

(OR)

6 a) Sketch the root locus plot of a unity feedback system with an open loop transfer function G(s) = $\frac{K}{s(s+2)(s+4)}$. 8 Marks

b) Discuss the effect of addition of poles and zeros to the open loop transfer function. 6 Marks

UNIT-IV

7 Sketch the bode plot of the system with open loop transfer function **$G(s)=1/s^2(1+s)(1+2s)$**, Find gain margin and phase margin of the system. 14 Marks

(OR)

8 a) State and explain Nyquist stability criterion to determine the stability of a system. 6 Marks

b) Sketch the polar plot and determine gain margin and phase margin for open loop transfer function of unity feedback system **$G(s) = 1/s(s+2)(s+4)$**. 8 Marks

UNIT-V

9 a) Define the terms State variable and state transition matrix. 6 Marks

b) Obtain the state space representation in Phase variable and Jordan form for the system whose transfer function is given by $T(s)=(s+1)/s(s+4)(s+5)$. 8 Marks

(OR)

10 a) Obtain state variable representation of a armature controlled DC motor. 6 Marks

b) Convert the given system matrix into diagonal form. 8 Marks

$$A=\begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -6 & -11 & -6 \end{bmatrix}$$

CODE No.:14BT40104 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations January – 2022

FLUID MECHANICS - II
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	A circular disc 3m in diameter is held normal to a 15m/s wind having specific weight of 11.8N/m^3. If the drag coefficient is 0.4 find the power required to hold it.	6 Marks
	b)	Define drag and lift forces.	4 Marks
	c)	What is Magnus effect?	4 Marks

(OR)

2		What is meant by separation of boundary layer and how do you control the same.	14 Marks

UNIT-II

3	a)	Derive dynamic equation for gradually varied flow.	7 Marks
	b)	When does a hydraulic jump occurs? Also give its applications.	7 Marks

(OR)

4		Define specific energy. And explain specific energy curve.	14 Marks

UNIT-III

5		Derive an expression for force exerted on a stationary flat plate held inclined to the jet and find the force exerted by the jet on a flat stationary plate having 75mm diameter issues with a velocity of 30 m/s.	14 Marks

(OR)

6		Show that the efficiency of a free jet striking normally on a series of flat plates mounted on the periphery of a wheel can never exceed 50%.	14 Marks

UNIT-IV

7		A Pelton wheel produces 8000kw under a head of 130 m at a speed of 200 r.p.m. The coefficient of velocity is 0.98, hydraulic efficiency is 87%, speed ratio is 0.45 and jet diameter is one tenth of the wheel diameter. Find the discharge, diameter of the wheel, diameter and number of jets required and the specific speed. The mechanical efficiency is 75%.	14 Marks

(OR)

8		Give the classification of hydro power plants.	14 Marks

UNIT-V

9		Define the various heads and efficiencies of a centrifugal pump and derive an expression for the specific speed of a centrifugal pump.	14 Marks

(OR)

10		Explain with a neat sketch of different components of hydropower plant and write the procedure to calculate discharge using mass curve.	14 Marks

CODE No.:14BT40301 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations January - 2022

KINEMATICS OF MACHINERY

[MECHANICAL ENGINEERING]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) What do you mean by constrained motion? What are the different types of constrained motions? Explain each type with examples and with neat sketches. 8 Marks

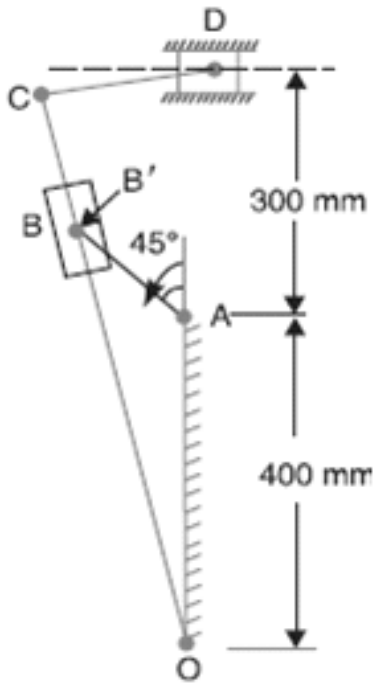
b) Define the following terms: link, kinematic pair, kinematic chain and mechanism. 6 Marks

(OR)

2 What do you mean by inversion of mechanism? Explain with sketches all inversions of single slider crank chain. 14 Marks

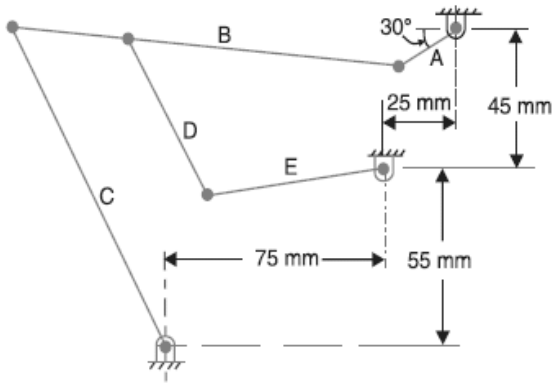
UNIT-II

3 A mechanism of a crank and slotted lever quick return motion is shown in figure. If the crank rotates counter clockwise at 120 r.p.m., determine for the configuration shown, the velocity and acceleration of the ram D. Also determine the angular acceleration of the slotted lever. 14 Marks
Crank, AB = 150 mm ; Slotted arm, OC = 700 mm and link CD = 200 mm.



(OR)

4 In the mechanism shown in figure. find the instantaneous centres of the links B, C and D. If the link A rotates clockwise at 10 rad/s, find the angular velocity of link E. The lengths of various links are as follows:Link A = 25 mm ; Link B = Link C= 100 mm ; Link D = Link E = 50 mm. The link D is hinged to linkB at 25 mm from the left hand end of link B. 14 Marks



UNIT-III

5 a) Show thatPaucellier mechanism can be used to trace a straight line. 7 Marks

b) What is Scott-Russel Mechanism? What is its limitation? How is it modified? 7 Marks

(OR)

6 A double universal joint is used to connect two shafts in the same plane. The intermediate shaft is inclined at an angle of 20˚to the driving shaft as well as the driven shaft. Find the maximum and minimum speed of the intermediate shaft and the driven shaft if the driving shaft has a constant speed of 500 rpm. 14 Marks

UNIT-IV

7 Draw the profile of a cam to raise a valve with harmonic motion through 40 mm in 1/3 of revolution, keep it fully raised through 1/12 revolution, and to lower it with harmonic motion in 1/6 revolution. The valve remains closed during the rest of the revolution. The diameter of the roller is 20 mm and minimum radius of the cam is to be 25 mm. The diameter of the cam shaft is 25 mm. The axis of the valve rod passes through the axis of the cam shaft. Assume the cam shaft to rotate with a uniform velocity. 14 Marks

(OR)

8 Draw the profile of a cam to give the following motion to the reciprocating follower with a flat or mushroom contact surface: 14 Marks

a) Follower to move outward through a distance of 30 mm during 120^0 of cam rotation

b) Follower to dwell for 30^0 of cam rotation

c) Follower to return to its initial position during 120^0 of cam rotation

d) Follower to dwell for the remaining 90^0 of cam rotation.

The minimum radius of cam is 25 mm and the flat face of the follower is at right angles to the line of stroke of the follower. The outward and return strokes of the follower are take place with uniform acceleration and retardation motion.

UNIT-V

9 a) Derive an expression for length of path of contact. 7 Marks

b) Two gear wheels mesh externally to give a velocity ratio of 3:1. The teeth are of involute form; module = 6mm. Addendum = one module; pressure angle = 20˚. The pinion rotates at 90rpm. 7 Marks

Find i) Number of teeth on each wheel to avoid interference
ii) The length of path of contact.

(OR)

10 a) What is an epicyclic gear train? In what manner does it differ from a simple of compound gear train? 6 Marks

b) A compound gear train consists of six gears. The number of teeth on each gear is as follows: 8 Marks

Gear	A	B	C	D	E	F
No.of teeth	60	40	50	25	30	24

Determine i) Speed of the output shaft
ii) Output torque
iii) Holding torque

CODE No.:14BT40402 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations January - 2022

ELECTRONIC CIRCUIT ANALYSIS AND DESIGN

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Derive the expression for the bandwidth of multistage amplifier.	6 Marks
	b)	Explain the principle of operation of direct coupled amplifier and mention its advantages.	8 Marks
		(OR)	
2	a)	With the help of a neat circuit diagram, describe the working of a cascode amplifier.	7 Marks
	b)	Discuss the different types of coupling schemes used in multistage amplifiers.	7 Marks

UNIT-II

3	a)	Explain the frequency response of amplifier at low and high frequencies.	7 Marks
	b)	Define F_T , F_α and F_β and find relation between F_T and F_β.	7 Marks
		(OR)	
4	a)	Derive equations for the voltage gain, input admittance, input capacitance and output resistance for common source amplifier.	7 Marks
	b)	Explain FET small signal model.	7 Marks

UNIT-III

5	a)	Explain in detail about the different feedback topologies.	8 Marks
	b)	A transistor Colpitt's oscillator uses a tank circuit with L = 30mH, C_1 = 200PF and C_2 = 200PF. What is the frequency of oscillators?	6 Marks
		(OR)	
6	a)	Draw the circuit diagram of a current series feedback and derive expressions for output resistance and input resistance.	7 Marks
	b)	Show that Voltage shunt feedback amplifier trans resistance gain, R_i , R_0 are decreased by a factor (1+Aβ) with feedback.	7 Marks

UNIT-IV

7	a)	With The help of a neat diagram, explain the operation of a complementary symmetry configured class B power amplifier.	9 Marks
	b)	Compare series fed and Transformer coupled class A amplifier.	5 Marks
		(OR)	
8	a)	Show that how even harmonics cancel out and overall distortion is reduced in a push pull configuration.	8 Marks
	b)	List the advantages of complementary-symmetry configuration over push pull configuration.	6 Marks

UNIT-V

9	a)	Explain the operation of a Double tuned amplifier.	8 Marks
	b)	Explain the advantages of double tuned circuit over single tuned circuit.	6 Marks
		(OR)	
10	a)	Why parallel resonance circuits are used in tuned amplifiers? Explain.	6 Marks
	b)	Draw the equivalent circuit of capacitance coupled single tuned amplifier and derive the equation for voltage gain.	8 Marks

CODE No.:14BT40403 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations January - 2022

ELECTROMAGNETIC THEORY AND TRANSMISSION LINES

[ELECTRONICS AND COMMUNICATION ENGINEERING]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain Gauss law and its application with one example.	7 Marks
	b)	Derive expression for the electric field for symmetrical charge distributions	7 Marks
		(OR)	
2	a)	Explain about Electric potential and give the relation between E and V.	5 Marks
	b)	Given that $D=z\rho\cos^2\phi\ a_z\ C/m^2$, calculate the charge density at $(1,0^0,3)$ and the total charge enclosed by the cylinder of radius 1m with $-2<z<2m$.	9 Marks

UNIT-II

3	a)	State and explain Biot-Savart's law.	7 Marks
	b)	Derive expression for magnetic field intensity at any point on the axis of circular coil carrying current.	7 Marks
		(OR)	
4	a)	Explain about the magnetic vector potential and derive its expression.	7 Marks
	b)	State and explain Ampere's circuital law with applications.	7 Marks

UNIT-III

5	a)	What is the inconsistency in Ampere's Law? How it is rectified by Maxwell?	7 Marks
	b)	Write Maxwell's equations in integral form and differential form for time varying fields.	7 Marks
		(OR)	
6	a)	Explain the concept of displacement current.	7 Marks
	b)	State and prove electrostatic boundary conditions.	7 Marks

UNIT-IV

7	a)	Define uniform plane wave? Give the relation between E and H in a uniform plane wave?	7 Marks
	b)	When the amplitude of the magnetic field in a plane wave is 2 A/m: (a) Determine the magnitude of the electric field for the plane wave in free space (b) Determine the magnitude of the electric field when the wave Propagates in a medium which is characterized by $\sigma=0$, $\mu=\mu_0$.	7 Marks
		(OR)	
8	a)	Derive expression for reflection and transmission coefficients of an EM wave when it is incident normally on a dielectric.	7 Marks
	b)	Explain the significances of Poynting theorem and Poynting vector.	7 Marks

UNIT-V

9	a)	Definite following terms and explain their physical significance. i) Attenuation constant ii) Characteristic impedance iii) Phase constant iv) velocity	7 Marks

b) At 8 MHz the characteristic impedance of transmission line is (40-j2) and the propagation constant is (0.01+j0.18) per meter. Find the primary constants. 7 Marks

(OR)

10 a) Derive the characteristic impedance of a transmission line in terms of its line constants 7 Marks

b) Sketch the voltage and current distribution along matched, open and short circuited transmission lines. 7 Marks

CODE No.:14BT40404 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations January - 2022

SIGNALS AND SYSTEMS

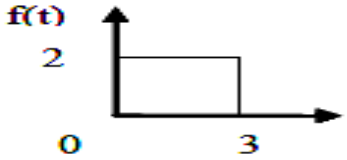
[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Sketch the even and odd parts of the signal shown below. 8 Marks



b) Find convolution of sequences x[n] = 2^n and h[n] = u[n]. 6 Marks

(OR)

2 Classify the Systems and explain them with examples. 14 Marks

UNIT-II

3 a) Consider full rectified sine have with peak amplitude '1' and time period is '1' expand this function in terms of exponential Fourier series. Also sketch the spectrum. 7 Marks

b) Derive the relation between Trigonometric and exponential Fourier series coefficients. 7 Marks

(OR)

4 a) State and prove Parseval's power theorem. 7 Marks

b) Find the Fourier transform of f (t) = Cos π t; **-½ ≤ t ≤ ½** and f (t) = 0; otherwise. 7 Marks

UNIT-III

5 a) Find the auto-correlation of the signal $x(t) = A\cos(w_0 t+\theta)$. 7 Marks

b) Write all the properties of power spectral density. 7 Marks

(OR)

6 a) What is the relation between correlation and filtering? 5 Marks

b) What is aliasing? What causes it and how can it be reduced? 5 Marks

c) How to reconstruct a signal from its samples using interpolation? 4 Marks

UNIT-IV

7 State and prove initial value and final value theorem of Laplace transform. 14 Marks

(OR)

8 a) Find the Laplace transform and Sketch the ROC of the Signal $x(t) = e^{-b|t|}$. 7 Marks

b) Determine inverse Laplace Transform of $F(s) = \frac{1}{(s-1)(s-2)(s-3)}$ if ROC is Re{S} < - 3. 7 Marks

UNIT-V

9 a) State and prove the convolution theorem of *Z* transform. 7 Marks

b) Find the *Z* transform of $x(n) = [a^n \cos w_0 n]u(n)$. 7 Marks

(OR)

10 State and prove initial value and final value theorem of Z-transform . 14 Marks

CODE No.:14BT40405 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations January - 2022

SWITCHING THEORY AND LOGIC DESIGN

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Convert the following. i) $(11011.1011)_2$ to decimal. ii) $(3FA8.2C)_{16}$ to equivalent binary representation. iii) $(7562.45)_{10}$ to Octal.	6 Marks
	b)	i) Subtract 1100110 and 1100001 using 2's complement form. ii) Explain the construction of Hamming code for 1010 message bits.	8 Marks
		(OR)	
2	a)	What is self complementing code? What are the advantages of this? Illustrate with an example code.	6 Marks
	b)	Perform the division in binary. 1011111 ÷ 101	4 Marks
	c)	Express the following numbers in decimal i) $(10110.0101)_2$ ii) $(16.5)_{16}$ iii) $(26.24)_8$ iv) $(12.34)_6$	4 Marks

UNIT-II

3	a)	Draw the multi level NOR circuit for the following. (AB'+CD')E+BC(A+B).	7 Marks
	b)	Simplify the Boolean function using tabular method. F(A,B,C,D) = ∑(0,1,2,8,10,11,14,15)+d(3,5).	7 Marks
		(OR)	
4	a)	Simplify the Boolean function and obtain its realization using only NAND gates: F(A,B,C,D= ∑(0,1,3,4,6,9,11)+d(2,5)	7 Marks
	b)	Assume propagation delay of EX OR gate is 20ns and OR & And gate is 10ns, and then find the propagation delay 4 bit parallel adder.	7 Marks

UNIT-III

5	a)	What is meant by binary parallel adder and design a 4 bit Carry look ahead adder.	7 Marks
	b)	Implement the following function with multiplexer F(x,y,z) = ∑m(0,2,6,7).	7 Marks
		(OR)	
6	a)	Construct a 16 x 1 Multiplexer using 4 x 1 Multiplexers.	6 Marks
	b)	Design 4 bit binary to gray code converter.	8 Marks

UNIT-IV

7		Design a synchronous 3-bit UP-DOWN counter using JK flip-flop	14 Marks
		(OR)	
8	a)	Compare combinational and sequential circuits	4 Marks
	b)	What is race around condition? How it is eliminated using master-slave JK flip-flop.	10 Marks

UNIT-V

9	a)	Describe the design procedure for asynchronous sequential circuits.	6 Marks
	b)	Find a circuit that has no static hazards and the Boolean function. F(*A, B, C, D*) = ∑*m*(1, 3, 5, 7, 8, 9, 14, 15).	8 Marks
		(OR)	
10		Explain in detail procedure of asynchronous circuit design with an example.	14 Marks

CODE No.:14BT41201 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations January – 2022

OBJECT ORIENTED PROGRAMMING
[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Write a Java Program that demonstrates the scope and life time of variables.	7 Marks
	b)	What is Access Control? Explain with suitable Java Program.	7 Marks
		(OR)	
2	a)	Explain the concept of Constructor with the help of suitable Java Program.	7 Marks
	b)	Explain the difference between a function in C Program and method in Java Program.	7 Marks

UNIT-II

3	a)	Differentiate Method Overloading and Method Overriding with the help of suitable Java Programs.	7 Marks
	b)	Explain the concept of Inheritance with the help of Base class and Sub class.	7 Marks
		(OR)	
4	a)	Explain different forms of Inheritance with examples.	7 Marks
	b)	Discuss about the benefits of Inheritance with suitable examples.	7 Marks

UNIT-III

5	a)	Write a Java program to change the priority of a thread.	7 Marks
	b)	Explain the need for synchronizing threads. Demonstrate with a suitable program.	7 Marks
		(OR)	
6	a)	Explain the terms: "final", "finally", "finalize".	6 Marks
	b)	What is an exception? How exception can be handled in Java in different ways?	8 Marks

UNIT-IV

7	a)	Design an Applet to draw a smiley on the panel. Get the dimensions for the smiley from the user through the textboxes.	7 Marks
	b)	Write an Applet program to display the banner for different names when executed.	7 Marks
		(OR)	
8	a)	Explain the methods of an Applet Skeleton in detail.	7 Marks
	b)	Create an Applet to control and resize the image from min to max dimension on click of a mouse.	7 Marks

UNIT-V

9	a)	Describe the Architecture of a Servlet. Explain with an example.	7 Marks
	b)	Write a java program to execute read and select queries in JDBC.	7 Marks
		(OR)	
10	a)	Describe how Exceptions are handled in servlets.	7 Marks
	b)	Write a Java program to connect with Database.	7 Marks

CODE No.:14BT50201 SVEC-14

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations January – 2022

CONTROL SYSTEMS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

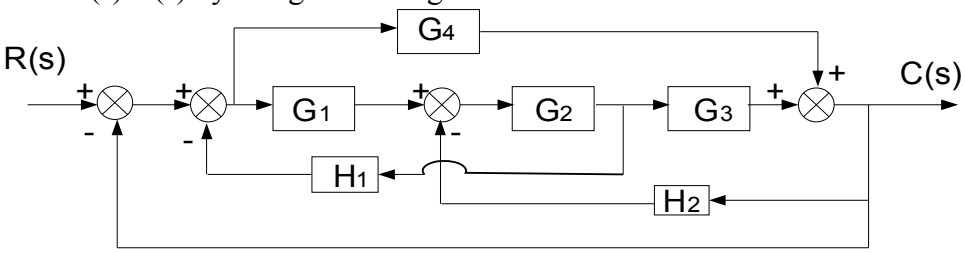
Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

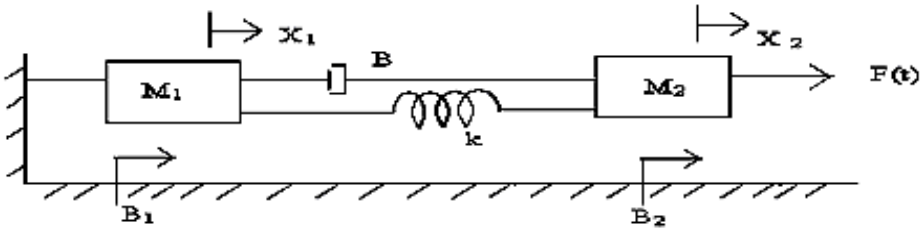
1 a) Write the advantages and disadvantages of open-loop and closed-loop control systems. 7 Marks

b) Draw the signal flow graph for the given block diagram. Obtain the transfer function C(s)/R(s) by using mason's gain formula. 7 Marks



(OR)

2 a) Determine the transfer function $\frac{X_2(S)}{F(S)}$. 7 Marks



b) Derive the transfer function of AC servomotor. 7 Marks

UNIT-II

3 a) A unity feedback system is characterized by a open loop transfer function G(s)=K/s(s+10). Determine the gain K so that the system will have a damping ratio of 0.5. For this value of K determine settling time, peak overshoot, and time to peak overshoot for unit step input. 8 Marks

b) Find all steady state errors for open loop transfer function with unity feedback given by G(s)= 10/s(0.1s+1). 6 Marks

(OR)

4 a) Discus the effect of P, PI, PD on control system characteristics. 6 Marks

b) Find the steady state error as a function of time for the unity feedback system G(s)= 100/s(1+0.1s), for the input r(t)=1+2t+(t^2/2). 8 Marks

UNIT-III

5 a) Determine the stability of the system represented by the characteristic equations $s^5 + s^4 + 3^3 + 9s^2 + 16s + 10 = 0$, also determine the number of roots on the right half s-plane. 7 Marks

b) Discus the effect of addition poles and zeros to open loop transfer function. 7 Marks

(OR)

6 A feedback control system has an open loop transfer function G(s). $H(s) = K/s(s+3)(s^2+2s+2)$. Find the root locus as K varies from 0 to ∞. 14 Marks

UNIT-IV

7 A unity feedback system has an open loop transfer function $G(s) = \frac{4s+1}{s^2(s+1)(1+2s)}$. 14 Marks

Sketch the Nyquist plot and determine whether the closed loop system stable or not.

(OR)

8 The open loop transfer function of a unity feedback system is given by $\frac{10(s+3)}{s(s+2)(s^2+4s+100)}$ draw the bode plot, find the gain margin and phase margin and comment on stability by bode plot. 14 Marks

UNIT-V

9 a) Define the terms State variable and state transition matrix. 6 Marks

b) Obtain the state space representation in Phase variable and Jordan form for the system whose transfer function is given by T(s)=(s+1)/s(s+4)(s+5). 8 Marks

(OR)

10 a) Obtain state variable representation of a armature controlled DC motor. 6 Marks

b) What are the advantages of state variable analysis? Also write the properties of state transition matrix. 8 Marks

CODE No.:14BT40104 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations July – 2022

FLUID MECHANICS - II
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Define boundary layer thickness and calculate displacement thickness, momentum thickness, shape factor and energy thickness for the velocity distribution of turbulent boundary layer. 14 Marks

(OR)

2 What is meant by separation of boundary layer and how do you control the same. 14 Marks

UNIT-II

3 a) Derive dynamic equation for gradually varied flow. 7 Marks

b) When does a hydraulic jump occurs? Also give its applications. 7 Marks

(OR)

4 A trapezoidal channel with side slopes of 1 to 1 has to be designed to convey $12m^3/s$ at a velocity of 2.5m/s so that the amount of concrete lining for the bed and sides is the minimum. Calculate the area of lining required for one metre length of canal. 14 Marks

UNIT-III

5 A jet of water of 60 mm diameter strikes a curved vane at its centre with a velocity of 18 m/s. The curved vane is moving with a velocity of 6 m/s in the direction of the jet. The jet is deflected through an angle of 165 degrees. Assuming the plate is smooth find thrust on the plate in the direction of jet, power of the jet and efficiency of the jet. 14 Marks

(OR)

6 Derive an expression for force exerted by the jet on the moving plate and find the force on the plate, work done and efficiency of the jet having a diameter 60mm delivers a stream of water at 24 m/s perpendicular to a plate that moves away from the jet at 6 m/s. 14 Marks

UNIT-IV

7 Explain with a neat sketch of different components of a hydro power plant and a Pelton wheel has to design to develop 750kw working under a head of 250m running at 800 r.p.m with overall efficiency of 85%. Take speed ratio as 0.45, coefficient of velocity 0.98, jet diameter to wheel diameter is 1/10. 14 Marks

(OR)

8 Give the classification of hydro power plants. 14 Marks

UNIT-V

9 Obtain an expression for the work done by the impeller of a centrifugal pump on water and explain the various efficiencies of a centrifugal pump. 14 Marks

(OR)

10 a) What are all the losses that occur during the operation of a centrifugal pump? 7 Marks

b) Expand and explain the term NPSH. 7 Marks

CODE No.:14BT40301 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations July - 2022

KINEMATICS OF MACHINERY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define and explain the terms: mechanism, machine, link and kinematic pair.	6 Marks
	b)	What do you understand by degrees of freedom? For a plane mechanism derive an expression for degrees of freedom.	8 Marks
		(OR)	
2		What do you mean by inversion of mechanism? Explain with sketches all inversions of quadric cycle chain.	14 Marks

UNIT-II

3		The crank and connecting rod of a horizontal steam engine are 0.5m and 2m long respectively. The crank makes 180 r.p.m. in the clockwise direction. When it has turned 45^{o} from the inner dead centre position, determine (i) velocity of piston (ii) Angular velocity of connecting rod (iii) velocity of point E on the connecting rod 1.5m from the gudgeon pin.	14 Marks
		(OR)	
4		A link AB of four-bar linkage ABCD revolves uniformly at 120 r.p.m in a clockwise direction. The link AD is fixed. Find the angular acceleration of links BC and CD. Given : AB = 75mm, BC = 175mm, CD = 150mm, DA = 100mm and angle BAD = 90^{0}.	14 Marks

UNIT-III

5	a)	List out various mechanisms used to draw exact straight lines.	7 Marks
	b)	Discuss with a neat sketch of the straight line motion Hart mechanism Prove that it produces an exact straight line motion.	7 Marks
		(OR)	
6	a)	Explain condition for correct steering with neat sketch.	7 Marks
	b)	Describe the working of Ackerman steering gear with neat sketch.	7 Marks

UNIT-IV

7	a)	What is a displacement diagram? Why is it necessary to draw it before drawing a cam profile?	4 Marks
	b)	Derive the relations for velocity and acceleration for a convex cam with a roller follower.	10 Marks
		(OR)	
8		From the following data draw the profile of a cam in which the follower moves with simple harmonic motion during ascent while it moves with uniformly accelerated and decelerated motion during descent: Least radius of cam = 50mm, Angle of ascent = 48^{0}, Angle of dwell between ascent and descent = 42^{0}, Angle of descent = 60^{0}, the lift of follower = 40mm, diameter of roller 20mm, distance between line of action of follower and axis of cam = 20mm. If the cam rotates at 360 r.p.m clockwise, find the maximum velocity and acceleration of the follower during descent.	14 Marks

UNIT-V

9 a) State and prove the law of gearing. 8 Marks

b) Show that the involute curves as the profiles of mating gears satisfy the law of gearing. 6 Marks

(OR)

10 a) What do you understand by 'gear train'? Discuss the various types of gear trains. 4 Marks

b) In an epicyclic gear train, an annular wheel A having 54 teeth meshes with a planet wheel B which gears with a sun wheel C, the wheels A and C being rotates about the axis of the wheels A and C. If the wheel A makes 20 r.p.m in a clockwise sense and the arm rotates at 100 r.p.m in the anticlockwise direction and the wheel C has 24 teeth, determine the speed and direction of rotation of wheel C. 10 Marks

CODE No.:14BT40303 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations July - 2022

THERMAL ENGINEERING - I

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What are the important basic components of an IC engine? Explain them briefly.	7 Marks
	b)	Give the comparison of air-standard and fuel-air cycles.	7 Marks
		(OR)	
2	a)	Draw the cross-section of a Spark-Ignition engine to show different components of it and explain their functions.	7 Marks
	b)	Explain how the actual cycles for IC engines differ from air-standard cycles.	7 Marks

UNIT-II

3	a)	Explain the phenomenon of knock in SI engines.	7 Marks
	b)	What are the different types of combustion chambers used in CI engines? Explain with the help of simple diagrams.	7 Marks
		(OR)	
4	a)	Discuss the factors that influence the flame speed in an engine cylinder.	7 Marks
	b)	Discuss the important qualities of fuels used in SI and CI engines.	7 Marks

UNIT-III

5	The following readings were taken during the test of a single- cylinder four stroke oil engine: Cylinder diameter = 250mm, Stroke length = 400mm, Gross m.e.p =7 bar, Pumping m.e.p = 0.5 bar, Engine speed = 250 r.p.m, Net load on brake = 1080 N, Effective diameter of the brake = 1.5m , Fuel used per hour = 10 kg , C.V of fuel = 44300kJ/kg. Calculate: i) Indicated power. ii) Brake power. iii) Mechanical efficiency. iv) Indicated thermal efficiency.	14 Marks
	(OR)	
6	With neat sketch, explain the measurement of Indicated horse power and Brake power.	14 Marks

UNIT-IV

7	What are the advantages of variable compression ratio engine? And discus the important design of VCR engine and comment on their salient points.	14 Marks
	(OR)	
8	Describe with neat sketches the working principle of wankel combustion engine and discus the application of wankle engine.	14 Marks

UNIT-V

9	a)	Describe with a neat sketch the construction and working of single stage single acting reciprocating air compressor.	7 Marks
	b)	What do you mean by multi stage compressor? State its advantages.	7 Marks
		(OR)	
10	a)	Explain the working principle of an axial flow compressor. Give its advantages and applications.	7 Marks
	b)	Discuss the effect of inter-cooling in multi-stage compressors.	7 Marks

CODE No.:14BT40402 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations July – 2022

ELECTRONIC CIRCUIT ANALYSIS AND DESIGN

[Electrical and Electronics Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Derive the expression for the bandwidth of multistage amplifier.	6 Marks
	b)	Explain the Principle of operation of direct coupled amplifier and mention its advantages.	8 Marks

(OR)

2	a)	With the help of a neat circuit diagram, describe the working of a cascode amplifier.	7 Marks
	b)	Discuss the different types of coupling schemes used in multistage amplifiers.	7 Marks

UNIT-II

3	a)	Draw a small signal low-frequency model of a FET and explain its various elements.	8 Marks
	b)	Draw the frequency response of an amplifier and explain the reason for different for the different slopes in the response.	6 Marks

(OR)

4	a)	Draw the high frequency equivalent circuit for a FET amplifier. Derive the values of all the parameters.	9 Marks
	b)	Define h_{fe}, h_{oe}, h_{re}, h_{ie} of a CE transistor.	5 Marks

UNIT-III

5	a)	With a neat sketch, explain the working of RC phase shift oscillator.	6 Marks
	b)	Draw the circuit diagram of a voltage series feedback amplifier and derive expressions for voltage gain with and without feedback.	8 Marks

(OR)

6	a)	Derive the expressions for voltage gain, input impedance and output impedance of a voltage shunt feedback Amplifier.	8 Marks
	b)	Explain the effect of negative feedback on amplifier bandwidth.	6 Marks

UNIT-IV

7	a)	Show that how even harmonics cancel out and overall distortion is reduced in a push pull configuration.	8 Marks
	b)	Compare series fed and Transformer coupled Class A power amplifiers.	6 Marks

(OR)

8	a)	State the merits of using push pull configuration? Describe the operation of class B push pull amplifier and show how even harmonics are eliminated.	7 Marks
	b)	Design a class B power amplifier to obtain the maximum conversion efficiency is 78.5%.	7 Marks

UNIT-V

9		Describe the following briefly: i) Stagger Tuned Amplifiers. ii) Heat Sinks for tuned power amplifiers.	14 Marks

(OR)

10	a)	Why two tuned circuits are used in double tuned amplifier? Explain clearly.	7 Marks
	b)	Why parallel resonance circuits are used in tuned amplifiers? Explain.	7 Marks

❀ ❀ ❀

CODE No.:14BT40403 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations July – 2022

ELECTROMAGNETIC THEORY AND TRANSMISSION LINES

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	State Coulomb's law and define various types of charge distributions.	7 Marks
	b)	Derive an expression for electric field due to an electric dipole.	7 Marks
		(OR)	
2	a)	Derive the expression for the energy stored in an electrostatic field.	7 Marks
	b)	Derive the expression for the capacitance of a coaxial cable.	7 Marks

UNIT-II

3	a)	Prove that isolated magnetic charge does not exist.	7 Marks
	b)	Derive the expression for force between two current elements.	7 Marks
		(OR)	
4	a)	Distinguish between scalar and vector magnetic potential.	7 Marks
	b)	Explain about magnetic energy.	7 Marks

UNIT-III

5	a)	What is the inconsistency in Ampere's Law? How it is rectified by Maxwell?	7 Marks
	b)	Explain how the concept of displacement current was introduced by Maxwell to account for the production of magnetic fields in the empty space.	7 Marks
		(OR)	
6	a)	Derive Maxwell's equations for time varying fields.	7 Marks
	b)	If $\vec{E}$ of an electromagnetic wave in free space is given by $\vec{E} = 2\cos\omega\,(t - z/\upsilon_0)\,\overrightarrow{ay}\,V/m$, find the magnetic field, $\vec{H}$.	7 Marks

UNIT-IV

7	a)	Derive Uniform plane wave equation.	7 Marks
	b)	Derive the general solution of Uniform plane wave equation.	7 Marks
		(OR)	
8	a)	Derive expression for reflection and transmission coefficients of an EM wave when it is incident normally onto a dielectric.	7 Marks
	b)	Define complex poynting vector and explain how to obtain average power.	7 Marks

UNIT-V

9	a)	Derive the equation for the input impedance of a transmission line.	7 Marks
	b)	Write short notes on reflection coefficient, standing wave ratio and transmission coefficient.	7 Marks
		(OR)	
10	a)	Explain the principle of impedance matching with quarter wave transformer.	7 Marks
	b)	A low transmission line of 100Ω characteristic impedance is connected to a load of 400Ω. Calculate the reflection coefficient and standing wave ratio. Derive the relationships used.	7 Marks

CODE No.:14BT40404 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations July – 2022

SIGNALS AND SYSTEMS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the concept of Unit Impulse and Unit Step functions.	6 Marks
	b)	Explain how the signals and systems are classified.	8 Marks
		(OR)	
2	a)	Find convolution of two signals. $x(t) = 1,\ 0<t<T$ and $h(t) = t,\ 0<t<2T$; $= 0$, otherwise; $= 0$, otherwise	9 Marks
	b)	List the properties of Causal, Stable and Linear Time-Invariant Systems.	5 Marks

UNIT-II

3	a)	What is exponential fourier spectrum? Explain with necessary equations.	7 Marks
	b)	State the properties of Fourier series.	7 Marks
		(OR)	
4	a)	Find the Fourier transform of $f(t) = \cos \pi t$; $-\frac{1}{2} \le t \le \frac{1}{2}$ and $f(t) = 0$ otherwise.	8 Marks
	b)	Prove frequency and time shifting properties of Fourier Transform.	6 Marks

UNIT-III

5	a)	Determine the relation between convolution and correlation.	7 Marks
	b)	Explain the concept of filtering and how is it useful in the extraction of signal from noise.	7 Marks
		(OR)	
6	a)	Explain briefly reconstruction of signal from its samples.	8 Marks
	b)	Derive the relation between correlation and power spectral density.	6 Marks

UNIT-IV

7	a)	Derive the relation between Laplace transform and Fourier transform of signal.	7 Marks
	b)	Find the initial and final values of signal $X(t)$ whose Laplace transform is $X(s) = (7s + 10) / [s(s + 2)]$	7 Marks
		(OR)	
8	a)	Describe the ROC of the signal $x(t) = e^{-b\|t\|}$ For $b > 0$ and $b \le 0$	7 Marks
	b)	Find the inverse Laplace transform of $X(s) = (-5s-7) / (s+1)(s-1)(s+2)$	7 Marks

UNIT-V

9	a)	State and Prove the convolution theorem of Z transform.	7 Marks
	b)	Find the Z transform of $x(n) = [a^n \cos w_0 n]u(n)$.	7 Marks
		(OR)	
10		State and prove initial value and final value theorem of Z-transform .	14 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations March – 2021

STRUCTURAL ANALYSIS - I

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Derive the expression for stresses on an inclined plane of block subjected to normal stress and shear stress along the two planes at right angles. 14 Marks

(OR)

2 The stress on two perpendicular planes through a point are 60 N/mm^2 (tension), 40 N/mm^2 (compression) and 30 N/mm^2 (shear). Find the stress components and the resultant of stresses on a plane at 60 deg to that of the tensile stress. 14 Marks

UNIT-II

3 A cantilever beam of length 7m, carries a point load at a distance of 4m from the fixed end. Find the deflection and slope under the point load and at the free end using Macaulay's method. Take E = 2.1 x 10^5 MPa and I = 86 x 10^6 mm^4. 14 Marks

(OR)

4 A simply supported rectangular R.C beam is of length 3m and cross section 100mm x 200mm. It carries a point load of 20kN at a distance of 1m from the left support. Find the maximum slope and maximum deflection under the point load. Take E = 1 x 10^4 N/mm^2. 14 Marks

UNIT-III

5 What are the assumptions made in the Euler's theory? Derive the Euler's critical load formula for long column with both ends hinged. 14 Marks

(OR)

6 A hollow cylinder cast iron column is 4m long with both ends fixed. Determine the minimum diameter of the column if it has to carry a safe load of 250kN with a factor of safety 5. Take the internal diameter as 0.8 times the external diameter, take a=1/1600 and σ_c=550MN/m^2. 14 Marks

UNIT-IV

7 A fixed beam AB of length 5m is carrying a point load of 20kN at C. Find the fixed end moments if AC= 2m and CB= 3m. Draw the S.F and B.M diagrams. If EI= 2400 kN-m^2, find the location and magnitude of maximum deflection and deflection at C. 14 Marks

(OR)

8 A continuous beam ABC is simply supported at A, B and C and having AB = 5m, BC= 3m. The span AB carries a point load of 4 kN at 2m away from the support A. The span BC is carrying a **u.d.l** of 2 kN/m. Find the reactions and bending moments at supports A, B and C. Also draw the S.F and B.M diagrams. 14 Marks

UNIT-V

9 A beam of rectangular section 180mm wide and 260mm deep is used over a simply supported span of 6.6m to support two concentrated loads of 8 kN each at 3m from either support. The plane of loads makes an angle of 34^0 with the vertical plane of symmetry. Find the direction of the neutral axis and the maximum bending stresses in the beam. 14 Marks

(OR)

10 14 Marks

A solid circular shaft is subjected to a bending moment of 70 kN/m and a torque of 30 kN/m. Design the diameter of the shaft according to:

i) The Maximum Principal Stress Theory
ii) The Maximum Shear Stress Theory and
iii) The Maximum Distortion Energy Theory.

Take Poisson's ratio = 0.29, the stress at elastic limit of the material is 255 MPa and the factor of safety=2.75.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations March – 2021

FLUID MECHANICS - II
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	A flat plate 2m x 2m is immersed in water flowing with a velocity of 5m/s. Find the forces of drag and lift as 0.05 and 0.2 respectively	7 Marks
	b)	What is Von Karman momentum integral equation and where can it be applied.	7 Marks
		(OR)	
2		Give the characteristics of boundary layer along a thin flat plate.	14 Marks

UNIT-II

3	a)	Derive dynamic equation for gradually varied flow.	7 Marks
	b)	When does a hydraulic jump occurs? Also give its applications.	7 Marks
		(OR)	
4		A trapezoidal channel with side slopes of 1 to 1 has to be designed to convey $12m^3/s$ at a velocity of 2.5m/s, so that the amount of concrete lining for the bed and sides is the minimum. Calculate the area of lining required for one metre length of canal.	14 Marks

UNIT-III

5		Obtain an expression for the force exerted by jet of water on a stationary curved plate in the direction of the jet when the jet strikes the curved plate at the centre and a jet of water of diameter 10cm strikes a flat plate normally with a velocity of 15m/s. The plate is moving with a velocity of 6m/s in the direction of the jet and away from the jet. Find: i) the force exerted by the jet on the plate. ii) work done by the jet on the plate per second.	14 Marks
		(OR)	
6		A jet of water having velocity of 20m/s strikes a curved vane, which is moving with a velocity of 10m/s. The jet makes an angle of 20^0 with the direction of motion of vane at inlet and leaves at an angle of 130^0 to the direction of motion of vane at outlet. Calculate: i) Vane angles, so that the water enters and leaves the vane without shock. ii) Work done per second per unit weight of water striking (or work done per unit weight of water striking) the vane per second.	14 Marks

UNIT-IV

7	a)	Under what headings the turbines can be classified.	7 Marks
	b)	A pelton wheel has to be designed for the following data: Power to be developed = 6000kW; Net head available = 300m; Speed = 550 r.p.m.; Ratio of jet diameter to wheel diameter = 1/10; overall efficiency = 85%. Find the number of jets, diameter of the jet, diameter of the wheel and the quantity of water required.	7 Marks
		(OR)	
8		Give the classification of hydro power plants.	14 Marks

UNIT-V

9	a)	Water is to be pumped out of a deep well under a total head of 95m. A number of identical pumps of design speed 1000 r.p.m. and specific speed 900 r.p.m. with a rated capacity of 150 litres/second are available. How many pumps will be needed and how should they be connected?	7 Marks
	b)	When do you go for multi stage pumps?	7 Marks

(OR)

10		Explain different components of hydropower plant and write the procedure to calculate discharge using mass curve with a neat sketch.	14 Marks

CODE No.:14BT40204 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations March – 2021

TRANSFORMERS AND INDUCTION MACHINES
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Derive the EMF equation of a single phase transformer and explain the no-load condition of a single phase transformer with phasor diagram.	7 Marks
	b)	Define Voltage regulation of a transformer. Derive the approximate voltage drop equation for lagging loads.	7 Marks

(OR)

2	a)	Draw and explain the phasor diagram of a transformer for inductive and capacitive loads.	7 Marks
	b)	The efficiency of 1000KVA, 11KV/220V, 50Hz, 1-φ transformer is 98.5% at half full load at 0.8 p.f leading and 98.8% at full load UPF. Determine: i) Iron losses. ii) Full load copper losses. iii) Find maximum efficiency KVA at UPF.	7 Marks

UNIT-II

3	a)	Explain how Sumpner's test is conducted on a pair of transformers with a neat diagram.	7 Marks
	b)	Two single phase transformers with equal turns have impedance of (0.5+j3)Ω and (0.6+j10)Ω with respect to the secondary. If they operate in parallel, determine how they will share total load of 100KW at 0.8 power factor lagging.	7 Marks

(OR)

4	a)	Explain how OC and SC tests are conducted on a single phase transformer with neat diagram.	7 Marks
	b)	Explain the operating principle of auto transformer and derive an expression for the saving in copper when compared to an ordinary transformer.	7 Marks

UNIT-III

5	a)	Explain the Scott connection with neat diagrams.	7 Marks
	b)	Describe four possible ways of connections of 3-phase transformers with relevant relations amongst voltages and currents on both HV and LV sides.	7 Marks

(OR)

6	a)	A 3-phase transformer has 400 turns on the primary and 40 turns on the secondary. The supply voltage is 3300V. Find the secondary voltage on no load when the windings are connected in (i) star-delta (ii) delta-star.	8 Marks
	b)	Explain the desirable conditions for the parallel operation of 3-phase transformers.	6 Marks

UNIT-IV

7	a)	Show that a 3-phase winding when excited by a three phase supply establishes a rotating magnetic field.	7 Marks
	b)	The full load power input to a 3-phase induction motor is 50Kw and the slip is 3%. Neglecting stator losses, calculate the full load cu losses and total mechanical power developed.	7 Marks

(OR)

8	a)	Draw the speed (vs.) torque curves of slip ring induction motor whose rotor resistance is externally changed such that $R_3 > R_2 > R_1$.	6 Marks
	b)	A 3-phase 4kW, 400V, 50Hz, 4 Pole induction motor runs at 1440 RPM at rated load condition. Compute its efficiency at rated load condition, where the rotational losses are 400 W and stator copper loss is equal to rotor copper loss.	8 Marks

UNIT-V

9		What is circle diagram? Explain the step by step procedure of drawing the circle diagram from the test data of a 3-phase induction motor and how to calculate its performance under different load conditions.	14 Marks

(OR)

10	a)	Explain auto transformer starting method of 3-phase induction motor.	7 Marks
	b)	The power input to a 3-phase induction motor is 60 KW. The stator losses are 1 KW. Find the mechanical power developed and the rotor copper loss per phase if the motor is running with a slip of 3%.	7 Marks

CODE No.:14BT40401 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations March – 2021

ANALOG COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Describe the detection of AM waves using square-law detector and envelope detector with neat diagrams.	7 Marks
	b)	Explain the generation and detection of DSB-SC Signals.	7 Marks
		(OR)	
2	a)	Describe the generation of AM signals with Square Law modulator.	8 Marks
	b)	A 1000 KHz carrier is simultaneously AM modulated with 300Hz, 800Hz and 2 KHz audio sine waves. What will be frequencies present in the output?	6 Marks

UNIT-II

3	a)	Derive the time domain band-pass representation of SSB signal.	7 Marks
	b)	Discuss the application of VSB modulation scheme to transmit TV signal.	7 Marks
		(OR)	
4	a)	Derive the time-domain and frequency domain representation of an SSB signal.	7 Marks
	b)	Explain the generation of SSB signals using frequency discrimination method.	7 Marks

UNIT-III

5	a)	Explain the notion of instantaneous frequency. Derive the instantaneous frequency of phase modulated and frequency modulated signals.	7 Marks
	b)	Derive the bandwidth and power of a NBFM and WBFM signal.	7 Marks
		(OR)	
6	a)	Derive the mathematical model of a PLL and explain its use in demodulating FM waveforms with a neat diagram.	7 Marks
	b)	Distinguish between angle modulation and amplitude modulation systems.	7 Marks

UNIT-IV

7	a)	With the aid of the block diagram, explain the function of super heterodyne receiver.	8 Marks
	b)	Discuss the advantages and disadvantages of TRF receiver.	6 Marks
		(OR)	
8		Demonstrate the scheme to study the noise performance of FM systems.	14 Marks

UNIT-V

9	a)	Draw the wave forms of PAM, PPM and PWM signals for sinusoidal modulating signal.	7 Marks
	b)	Compare merits and demerits of TDM and FDM multiplexing schemes.	7 Marks
		(OR)	
10	a)	Describe generation and detection of PAM signals with neat schematics.	8 Marks
	b)	Discuss various applications of pulse modulation schemes.	6 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations March - 2021

ELECTRONIC CIRCUIT ANALYSIS AND DESIGN

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain with suitable circuit diagram, the operation of transformer coupled transistorized amplifier.	8 Marks
	b)	Explain the essential difference between the RC coupled and direct coupled amplifier.	6 Marks
		(OR)	
2	a)	Give the equation of overall upper and lower cut off frequencies of multistage amplifiers.	10 Marks
	b)	Why capacitive coupling is used to connect a signal source to an amplifier?	4 Marks

UNIT-II

3		In a single stage RC coupled CE amplifier, explain the effect of bypass and coupling capacitor on frequency response with necessary analysis.	14 Marks
		(OR)	
4	a)	Sketch the circuit of a CS amplifier. Derive the expression for A_V at low frequencies. What is the maximum value of A_V?	7 Marks
	b)	Analyze the performance of common drain FET Amplifier at high frequencies.	7 Marks

UNIT-III

5	a)	What is meant by feedback? What are the effects of negative feedback?	7 Marks
	b)	In an RC phase shift oscillator if $R_1 = R_2 = R_3 = 80$ KΩ and $C_1 = C_2 = C_3 = 10$PF. The value of $R_C = 2$ KΩ. Find the frequency of oscillation.	7 Marks
		(OR)	
6	a)	Derive an expression for frequency of oscillation for RC phase shift oscillator.	9 Marks
	b)	Write a short note on crystal oscillator.	5 Marks

UNIT-IV

7	a)	Draw the circuit for a push-pull amplifier and discuss its working.	7 Marks
	b)	Derive an expression for the efficiency of class B - power amplifiers.	7 Marks
		(OR)	
8	a)	Draw the circuit for commonly used class A - amplifier. If the amplifier draws 10W of dc power, what is the maximum ac power available to the load?	7 Marks
	b)	What is the basis for the classification of power amplifiers? Mention different types of power amplifiers?	7 Marks

UNIT-V

9	a)	What is a tuned voltage amplifier? Explain it briefly.	6 Marks
	b)	A parallel resonant circuit has a band width of 15 KHz and Q-factor of 120. What is the resonant frequency of the circuit?	8 Marks
		(OR)	
10	a)	Explain the working of a double-tuned amplifier.	7 Marks
	b)	Explain in brief, the function of the tank circuit in a tuned-voltage amplifier.	7 Marks

❀ ❀ ❀

CODE No.:14BT40403 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations March – 2021

ELECTROMAGNETIC THEORY AND TRANSMISSION LINES

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	State and explain Coulomb's law.	7 Marks
	b)	Derive the boundary conditions for the tangential and normal components of electric fields at the boundary between two perfect dielectrics.	7 Marks
		(OR)	
2	a)	Find out capacitance for the coaxial cable.	7 Marks
	b)	Explain about continuity equation.	7 Marks

UNIT-II

3	a)	Explain Ampere's circuital law and its application with one example.	7 Marks
	b)	Illustrate two Maxwell's equations in magneto statics.	7 Marks
		(OR)	
4	a)	Derive the expression for the energy density in a Magnetic field.	7 Marks
	b)	If the magnetic field, $\vec{H} = 100\sin\theta\ \vec{a_\vartheta}\ A/m$ in spherical coordinates, determine $\vec{J}$ at (10, π/2, 0).	7 Marks

UNIT-III

5	a)	What is the inconsistency in Ampere's Law? How it is rectified by Maxwell?	7 Marks
	b)	Explain how the concept of displacement current was introduced by Maxwell to account for the production of magnetic fields in the empty space.	7 Marks
		(OR)	
6	a)	Express Maxwell's equations in differential form and their corresponding word statements.	7 Marks
	b)	An electric field in a medium which is source free is given by $\vec{E} = 1.5\cos(10^8 t = \beta\ z)\vec{ax}\ V/m$. Obtain $\vec{B}, \vec{H}$ and $\vec{D}$. Assume $\in_r$=1, μ_r=1 and σ = 0.	7 Marks

UNIT-IV

7	a)	Derive wave equations in free space.	7 Marks
	b)	Derive the relation between $\vec{E}$ and $\vec{H}$ in uniform plane wave.	7 Marks
		(OR)	
8	a)	Differentiate Conductors and Dielectrics. Obtain the wave propagation characteristics in good dielectrics.	7 Marks
	b)	Prove $\vec{P} = \vec{E} \times \vec{H}$.	7 Marks

UNIT-V

9	a)	Explain how transmission lines can be used as circuit elements.	7 Marks
	b)	Discuss about single stub matching.	7 Marks
		(OR)	
10	a)	Derive the expression for the characteristic impedance of a Lossless line.	7 Marks
	b)	Write short notes on reflection coefficient, standing wave ratio and transmission coefficient.	7 Marks

CODE No.:14BT40404 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations March – 2021

SIGNALS AND SYSTEMS

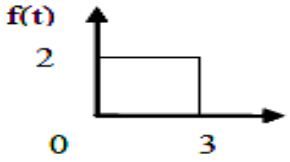
[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Sketch the even and odd parts of the signal shown below. 8 Marks



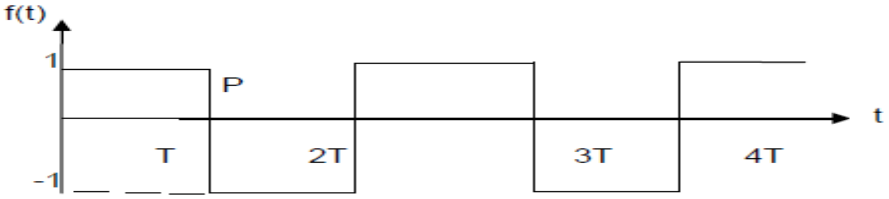
b) Find convolution of sequences x[n] = 2^n and h[n] = u[n]. 6 Marks

(OR)

2 Classify the Systems and explain them with examples. 14 Marks

UNIT-II

3 a) Find out the exponential Fourier series and plot the magnitude and phase spectrum for the rectangular pulse train shown below. 9 Marks



b) What is exponential Fourier spectrum? Explain with necessary equations. 5 Marks

(OR)

4 a) Find Fourier Transform of the function $x(t) = e^{-3t}[u(t+2) - u(t-3)]$. 5 Marks

b) Prove frequency and time shifting properties of Fourier Transform. 9 Marks

UNIT-III

5 a) Find the auto-correlation function and the energy spectral density of the signal $x(t) = e^{-t}u(t)$. 7 Marks

b) Derive the relation between auto-correlation and power spectral density. 7 Marks

(OR)

6 a) Explain briefly reconstruction of signal from its samples. 8 Marks

b) Derive the relation between correlation and power spectral density. 6 Marks

UNIT-IV

7 a) State and prove the final value theorem of Laplace transform. 7 Marks

b) Find the inverse Laplace Transform of 7 Marks

$$X(s) = \frac{-3}{(s+1)(s-1)}; \quad \text{ROC: } -2 < \sigma < 1.$$

(OR)

8 a) A certain function $f(t)$ is known to have a transform $F(s) = \frac{6s^2 + 8s - 5}{s(2s^2 + 6s + 5)}$. Find $f(0+)$ and $f(\infty)$. 7 Marks

b) Find the inverse Laplace Transform of $X(s) = \frac{s^2e^{-2s} + 2e^{-3s}}{s^2 + 4s + 3}$. 7 Marks

UNIT-V

9 a) Find the Z-transform of the sequence x(n)= $(1/4)^n$ cos (π n/3) u(n) and sketch the ROC. 7 Marks

b) Evaluate inverse Z-transform of X(Z)= [Z(Z-1)] / [$(Z+1)^3$(Z+2)]; ROC;|Z|>2. 7 Marks

(OR)

10 a) State and prove the final value theorem of Z-transform. 7 Marks

b) Determine the Z-transform and its ROC for the signal: $x(n) = (1/5)^n u(-n)$. 7 Marks

CODE No.:14BT40405 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations March – 2021

SWITCHING THEORY AND LOGIC DESIGN

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Perform the subtraction of decimal 9137-2345 using 9's complement method? Express the result in 8421, 2421 and excess-3 codes.	7 Marks
	b)	Briefly explain the Non-Weighted code binary number system.	7 Marks
		(OR)	
2	a)	Explain basic laws of Boolean algebra with examples.	7 Marks
	b)	Simplify the expression Z= AB'C' + AB'C + ABC using Boolean laws.	7 Marks

UNIT-II

3		Obtain the minimal SOP and POS of the following functions using K- Maps: i) $F_1(A, B, C, D) = \sum_m(1, 3, 7, 11, 15) + \sum_d(0, 2, 5)$ ii) $F_2(A, B, C, D) = \Pi_m(4, 5, 6, 7, 8, 12) + \Pi_d(1, 2, 3, 9, 11, 14)$	14 Marks
		(OR)	
4		Simplify the following Boolean function using Quine Mc'Clusky method: $F(A, B, C, D) = \sum_m(0, 1, 6, 7, 8, 9, 13, 14, 15)$.	14 Marks

UNIT-III

5	a)	Design a BCD to excess-3 code converter.	8 Marks
	b)	Explain the operation of 4-bit carry look ahead adder.	6 Marks
		(OR)	
6	a)	Design and implement a 4-bit BCD to decimal decoder.	8 Marks
	b)	Use a multiplexer having three data select inputs to implement the logic function: $F = \sum_m(0, 1, 2, 3, 4, 10, 11, 14, 15)$	6 Marks

UNIT-IV

7	a)	Explain the operation of parallel shift register with parallel load using neat logic diagram.	7 Marks
	b)	Explain Universal counter with neat diagram.	7 Marks
		(OR)	
8	a)	Compare combinational and sequential circuits	4 Marks
	b)	What is race around condition? How it is eliminated using master-slave JK flip-flop?	10 Marks

UNIT-V

9	a)	Describe the design procedure for asynchronous sequential circuits.	6 Marks
	b)	Find a circuit that has no static hazards and the Boolean function: $F(A, B, C, D) = \sum_m(1, 3, 5, 7, 8, 9, 14, 15)$	8 Marks
		(OR)	
10	a)	Explain the operation of debounce circuit with neat circuit diagram.	7 Marks
	b)	Find a circuit that has no static hazards and implements the Boolean function $F(A, B, C, D) = \sum(0, 2, 6, 7, 8, 10, 12)$	7 Marks

CODE No.:14BT40431 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations March – 2021

ANALOG ELECTRONIC CIRCUITS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Draw the circuit diagram and frequency response of an RC coupled amplifier. Further explain the role of coupling and bypass capacitors.	7 Marks
	b)	Draw the circuit diagram and equivalent high frequency model of emitter follower.	7 Marks
		(OR)	
2	a)	Derive the current gain of a CE amplifier with resistive load at high frequencies.	7 Marks
	b)	Derive the gain and input impedance of a CE amplifier with emitter resistance.	7 Marks

UNIT-II

3	a)	Describe the general characteristics of negative feedback amplifiers.	7 Marks
	b)	Explain the Barkhausein criteria for sustained oscillations.	7 Marks
		(OR)	
4	a)	Derive the effect of negative feedback on the output impedance in different feedback topologies.	7 Marks
	b)	Draw the circuit diagram of Colpitts oscillator and derive the expression for the frequency of oscillations.	7 Marks

UNIT-III

5	a)	Derive the conversion efficiency of a Class-B amplifier.	7 Marks
	b)	Compute the effective load resistance R_L seen looking into the primary of 8**:**1 transformer connected to the output load of 20Ω.	7 Marks
		(OR)	
6	a)	Distinguish between Class-A, Class-B and Class-AB amplifiers with neat diagrams.	7 Marks
	b)	Describe the second harmonic distortion in power amplifiers.	7 Marks

UNIT-IV

7	a)	Explain how clipping at two independent levels can be achieved.	8 Marks
	b)	Explain positive peak voltage limiters below reference level.	6 Marks
		(OR)	
8	a)	Draw the circuit diagram of a DC restorer (clamping circuits) and explain its operation with neat diagrams.	7 Marks
	b)	Explain the operation of transistor as a switch with neat diagrams and waveforms.	7 Marks

UNIT-V

9		Draw the circuit diagram for Schmitt trigger and explain its operation. Give the applications of the above circuit. Derive the expressions for UTP and LTP.	14 Marks
		(OR)	
10	a)	Explain how a Schmitt trigger can be used as a comparator and as a squaring circuit.	8 Marks
	b)	Summarize your understanding on hysteresis and explain how hysteresis can be eliminated in a Schmitt trigger.	6 Marks

❀ ❀ ❀

CODE No.:14BT40502 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations March – 2021

DATABASE MANAGEMENT SYSTEMS

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Describe the characteristics of database system.	8 Marks
	b)	Explain in detail about the three-schema architecture of DBMS.	6 Marks
		(OR)	
2	a)	Explain about various constraints used in ER-model.	6 Marks
	b)	Discuss in detail about various attributes used in E-R model with suitable examples.	8 Marks

UNIT-II

3		Explain in detail about various key constraints used in database system.	14 Marks
		(OR)	
4	a)	Explain different relational algebraic operations with example.	8 Marks
	b)	Write short notes on: i) DDL. ii) DML. iii) Database Schema.	6 Marks

UNIT-III

5	a)	What is meant by SQL? Explain about nested queries and NULL values in SQL.	7 Marks
	b)	Discuss about complex integrity constraints in SQL.	7 Marks
		(OR)	
6		Explain in detail about all functional dependencies based normal forms with suitable examples.	14 Marks

UNIT-IV

7	a)	List the ACID properties. Explain usefulness of each.	7 Marks
	b)	Discuss about multiple granularity.	7 Marks
		(OR)	
8	a)	Describe the concepts serializability and recoverability.	7 Marks
	b)	What is the time stamp based protocols? Explain any one of them.	7 Marks

UNIT-V

9	a)	Describe difference methods of defining indexes on multiple keys.	8 Marks
	b)	Explain in detail about external hashing techniques.	6 Marks
		(OR)	
10	a)	By considering example, show how to reduce access time with primary index.	7 Marks
	b)	Explain about B tree with suitable examples.	7 Marks

CODE No.:14BT41201 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations March – 2021

OBJECT ORIENTED PROGRAMMING
[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What are the different data types and their ranges in Java?	7 Marks
	b)	Write a Java program to find the biggest number present in the given array of *n* numbers.	7 Marks
		(OR)	
2	a)	Explain the OOP paradigm.	7 Marks
	b)	Write a Java program to accept five command line arguments and perform sorting in increasing order and display them.	7 Marks

UNIT-II

3	a)	List the similarities and differences of classes and interfaces.	7 Marks
	b)	Write a java program using inheritance that gets the properties of a person and extends to faculty and student and display the details accordingly.	7 Marks
		(OR)	
4	a)	Why subclass reference variables cannot refer to a super class object? Comment.	7 Marks
	b)	Design a interface queue with the following methods. i) enqueue and dequeue ii) qfull and qempty.	7 Marks

UNIT-III

5	a)	Explain the process of creating threads with suitable examples.	7 Marks
	b)	Write short note on synchronization of threads.	7 Marks
		(OR)	
6	a)	Define package. Create a simple package and describe its usage.	7 Marks
	b)	Explain logging in java with all its levels.	7 Marks

UNIT-IV

7	a)	Explain the life cycle of an Applet.	7 Marks
	b)	Design an Applet to display the status of a checkbox on click of a button.	7 Marks
		(OR)	
8	a)	Explain about Scroll pane and dialogs List Panel AWTs with the help of suitable Java program.	7 Marks
	b)	Write short note on Lay out Mangers.	7 Marks

UNIT-V

9	a)	Explain the steps and Java methods involved in establishing database connectivity.	7 Marks
	b)	Write a servlet program to demonstrate parameter passing from HTML script using post method.	7 Marks
		(OR)	
10	a)	Explain about different types of JDBC drivers.	7 Marks
	b)	Explain the process of creation and compiling of Servlet Source Code.	7 Marks

CODE No.:14BT50201 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations March – 2021

CONTROL SYSTEMS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

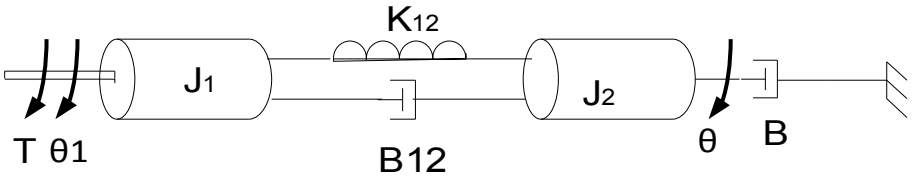
Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) What are the effects of feedback on sensitivity and external noise? 7 Marks

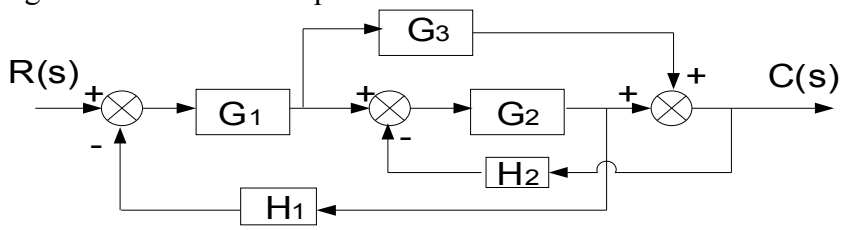
b) For the mechanical system, draw the electrical analogous circuits based on Torque-Voltage and Torque-Current analogy along their equations. 7 Marks



(OR)

2 a) Develop the block diagram for armature controlled DC motor. 7 Marks

b) Determine the overall transfer function for the system shown in the figure using block diagram reduction technique. 7 Marks



UNIT-II

3 a) Draw the second order system step response and indicate all time domain specifications. 6 Marks

b) A unity feedback system is characterized by the open loop transfer function G(s)=1000(s+1)/(s+10)(s+50). Determine the steady state error for unit-step, unit-ramp and unit acceleration inputs. Also determine the damping ratio and natural frequency of dominant roots. 8 Marks

(OR)

4 a) Discus the effect of P, PI, PD on control system characteristics. 6 Marks

b) Find the steady state error as a function of time for the feedback system G(s) = 100/s(1+0.1s), H(s) = 5/(s+4) for the input r(t) = 1+2t+(t^2/2). 8 Marks

UNIT-III

5 a) Determine the stability of the control system with characteristics equation $s^3 + 2s^4 + 2s^3 + 4s^2 + s + 2 = 0$ using Routh Hurwitz Criterion. 7 Marks

b) Determine the range of values of K such that the characteristic equation $s^3 + 3(K + 1)\, s^2 + (7K + 5)\, s + (4K + 7) = 0$ has roots more negative than $s = -1$. 7 Marks

(OR)

6 Sketch the root locus diagram for the following open loop transfer function: $\frac{K}{S(S+4)(S^2+4S+20)}$. 14 Marks

UNIT-IV

7 Sketch the bode plots showing the magnitude in dB and phase angle in degrees of G(s)=10/s(1+0.5s)(1+0.02s). Determine the gain cross over frequency, phase cross over frequency and margins. 14 Marks

(OR)

8 a) State and explain Nyquist stability criterion to determine the stability of a system. 7 Marks

b) What are compensating network? Explain about lead, lag networks. 7 Marks

UNIT-V

9 a) Define the terms State variable and State transition matrix. 6 Marks

b) Obtain the state space representation in Phase variable and Jordan form for the system whose transfer function is given by T(s) = (s+1)/s(s+4)(s+5). 8 Marks

(OR)

10 a) Find the Eigen value and Eigen vectors of the system represented with state space matrix A. Also derive diagonal matrix for the system. $A = \begin{bmatrix} 1 & 0 & 2 \\ 0 & 2 & 1 \\ 0 & 0 & 3 \end{bmatrix}$ 7 Marks

b) What are the advantages of state variable analysis? Also write the properties of state transition matrix. 7 Marks

CODE No.:16BT3HS01 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

ENVIRONMENTAL STUDIES

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Explain the need for public awareness about the environment and its degradation.	CO1	7 Marks
	b)	What do you mean by forest resource? Explain the direct and indirect benefits of forests.	CO2	7 Marks
		(OR)		
2	a)	Analysis the environmental effects of extracting and using mineral resources.	CO2	7 Marks
	b)	Discuss the reasons for land degradation and suggest the steps to control it.	CO3	7 Marks
		UNIT-II		
3	a)	What is ecological pyramid? Explain various types of ecological pyramids.	CO2	7 Marks
	b)	What is meant by bio-diversity and explain the three major components of bio-diversity?	CO1	7 Marks
		(OR)		
4	a)	Analyze the flow of energy through various components of the eco system.	CO2	7 Marks
	b)	Analyze the types and characteristics features of a forest ecosystem.	CO2	7 Marks
		UNIT-III		
5		Define solid waste management. Give classification of solid waste and discuss the health effects of solid waste pollution.	CO1	14 Marks
		(OR)		
6		What is meant my thermal pollution? Describe the control measures can be taken for controlling thermal pollution.	CO3	14 Marks
		UNIT-IV		
7		What do you meant by sustainable development? What are the major solutions to attain sustainability?	CO7	14 Marks
		(OR)		
8	a)	How the problems can be solved related to Nuclear accidents.	CO4	4 Marks
	b)	What are the provisions for the constitution of central and state boards under the water Act?	CO8	10 Marks
		UNIT-V		
9	a)	Discuss the reasons of high population growth in India.	CO2	4 Marks
	b)	What actions and strategies can be taken to prevent rapid growth of population? Explain.	CO1	10 Marks
		(OR)		
10		Write a report based on the visit in an industrial area.	CO9	14 Marks

❀ ❀ ❀

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

ELECTRONIC CIRCUIT ANALYSIS AND DESIGN
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Draw the h-parameter equivalent circuit of CE amplifier and derive the expressions for A_v, A_i, R_i, R_o.	CO2	7 Marks
	b)	Explain the operation of Bootstrapped Darlington Circuit with neat diagram.	CO1	7 Marks
		(OR)		
2	a)	Draw the h-parameter equivalent circuit of CC amplifier and derive the expressions for A_v, A_i, R_i, R_o.	CO2	8 Marks
	b)	Explain the operation of two stage Transformer coupled amplifier with neat diagram.	CO1	6 Marks

UNIT-II

3	a)	Explain the effect of coupling and bypass capacitors at high frequencies.	CO6	6 Marks
	b)	Derive the expressions for voltage gain and input admittance for common source amplifier at high frequencies.	CO2	8 Marks
		(OR)		
4	a)	Short circuit CE current gain of a transistor is 25 at a frequency of 2MHZ. If f_β = 200KHZ, calculate (i) f_T (ii) h_{fe} (iii) Find the $\|A_I\|$ at frequency of 10MHZ and 100 MHZ.	CO4	6 Marks
	b)	Derive the expressions for voltage gain, output resistance of common drain amplifier at high frequencies.	CO2	8 Marks

UNIT-III

5	a)	Write the advantages of negative feedback in amplifiers. Why negative feedback is not used in oscillators.	CO5	8 Marks
	b)	In a transistorized Hartley oscillator, two conductances are 2mH and 20μH, while the frequency is to be changed from 950KHZ to 2050KHZ. Calculate the range over which the capacitor is to be varied.	CO3	6 Marks
		(OR)		
6	a)	Draw the wein bridge oscillator and explain its operation and derive an expression for frequency of oscillations.	CO1	8 Marks
	b)	Calculate the gain, input resistance, output resistance of voltage series feedback amplifier having A=300, R_i=1.5KΩ, R_o=50KΩ and β=1/20.	CO4	6 Marks

UNIT-IV

7	a)	Explain the advantages of push-pull amplifiers. Derive an expression for the efficiency of a class-B push pull amplifier.	CO3	7 Marks
	b)	Explain the operation of class-B push pull amplifier with a neat diagram and derive the expression for efficiency.	CO1	7 Marks
		(OR)		

8	a)	Explain the classifications of power amplifiers based on the period of conduction.	CO1	4 Marks
	b)	A single stage class–A amplifier has V_{CC} = 20 volts, V_{CEQ} = 10 volts, I_{CQ} = 600mA and collector load resistor R_L =16Ω. The AC output current varies by ± 300mA with AC input signal. Determine: i) The power supplied by the source to the amplifier circuit. ii) DC power consumed by the load resistor. iii) AC power developed across the load resistor. iv) DC power delivered to the transistor. v) DC power wasted in transistor collector. vi) Overall efficiency. vii) Collector efficiency.	CO4	10 Marks

UNIT-V

9	a)	Explain the working of single tuned amplifier with a neat diagram. Draw the frequency response of single tuned amplifier.	CO1	8 Marks
	b)	With a neat circuit diagram, explain the operation of class-C tuned amplifier.	CO1	6 Marks

(OR)

10	a)	With a neat diagram, explain working of stagger tuned amplifier with its frequency response.	CO1	8 Marks
	b)	A single tuned RF amplifier uses a transistor with an output resistance of 50KΩ, output capacitance of 15PF and input resistance of next stage is 20kΩ. The tuned circuit consists of 47PF capacitance in parallel with series combinations of 1μH inductance and 2Ω resistance. Calculate: i) Resonant frequency. ii) Effective quality factor. iii) Bandwidth of the circuit.	CO4	6 Marks

CODE No.:16BT30402 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

SIGNALS AND SYSTEMS
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks.

UNIT-I

1	a)	Write the properties of Dirac-delta function.	CO1	6 Marks
	b)	Show that if the two signals $f_1(t)$ and $f_2(t)$ Are orthogonal over an interval t_1 and t_2, then energy of signal $[f_1(t) + f_2(t)]$ is equal to the sum of energies of $f_1(t)$ and $f_2(t)$.	CO2	8 Marks
		(OR)		
2	a)	What are the three elementary operations in block diagram representation of continous time system?	CO2	6 Marks
	b)	Determine whether the system is linear, time invariant, causal and memory less. $y(t) = \frac{1}{2}\int_{-\infty}^{t} x(z)dz$	CO2	8 Marks

UNIT-II

3	a)	Find the exponential fourier series of the waveform and also draw the frequency spectrum. $x(t)$= A for $0 \le t \le \pi$ -A for $\pi \le t \le 2\pi$	CO4	8 Marks
	b)	Represent the function e^t over the interval $0 \le t \le 1$ by using trigonometric fourier series.	CO1	6 Marks
		(OR)		
4	a)	Define fourier transform and state any four properties.	CO1	6 Marks
	b)	Find the fourier transform of signum function and unit step function.	CO4	8 Marks

UNIT-III

5	a)	If x(t) = Sin ω_0t, find (i) $R(\tau)$; (ii) *ESD*.	CO1	7 Marks
	b)	Verify Parseval's theorem for the energy signal $x(t) = e^{-4t}\,u(t)$.	CO4	7 Marks
		(OR)		
6	a)	Convolve the following signals $x[n] = u[n] - u[n-3]$ $h[n] = (0.5)^n\,u[n]$	CO1	7 Marks
	b)	Find the output voltage of the RC lowpass filter shown in figure for an input voltage of $t.e^{-t/RC}$.	CO5	7 Marks

UNIT-IV

7	a)	Obtain the relationship between laplace and fourier transforms.	CO1	7 Marks
	b)	Find the laplace transform and region of convergence for the following signals. i) $x(t) = e^{-5t}\,u(t-1)$ ii) $x(t) = e^t \sin 2t$.	CO4	7 Marks
		(OR)		
8	a)	Find the step response of the series R-L-C Circuit.	CO5	8 Marks
	b)	Discuss partial fraction method of finding inverse laplace transform.	CO1	6 Marks

UNIT-V

9	a)	State and prove sampling theorem for band pass signals.	CO1	7 Marks
	b)	Discuss the process of reconstructing the analog signal from its samples.	CO2	7 Marks
		(OR)		
10	a)	State and prove time shifting and time reversal property of Z-transform.	CO1	8 Marks
	b)	Find the Z – transform of $\boldsymbol{x[n] = a^n\, u[n] - b^n\, u[-n-1]}$ and specify its ROC.	CO4	6 Marks

CODE No.:16BT30403 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

SWITCHING THEORY AND LOGIC DESIGN

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Perform the following operations by using 2's complement method i).63-35. ii) -82-44. iii) 55+(-18).	CO1	6 Marks
	b)	Carry out the following conversions. Decimal 328.95 to binary, octal and Hexadecimal.	CO1	6 Marks
	c)	Determine the value of base if, $(225)_X = (175)_8$.	CO1	2 Marks
		(OR)		
2	a)	Simplify the given Boolean functions using basic Boolean theorems. i) $F = \overline{X} + XY + X\overline{Z} + \overline{YZ}$ ii) $F = (X\overline{Y} + \overline{W}Z)(W\overline{X} + Y\overline{Z})$ iii) $F = Y\overline{Z}(\overline{XY} + Y\overline{Z})$	CO5	6 Marks
	b)	Obtain the dual and compliment of the following functions. i) $F = (A\overline{B} + C)\overline{D} + E$ ii) $F = (\overline{X + Y + Z}) + XYZ.$	CO5	4 Marks
	c)	Construct Hamming code for BCD 0110 and BCD 0111. Use even parity.	CO4	4 Marks

UNIT-II

3	a)	For the function given below. f =WXY+X$\overline{Y}$Z+WX$\overline{Y}$ i) Express 'f' in standard SOP form. ii) Simplify using K-map. iii) Realize 'f' using NAND gates only.	CO1	7 Marks
	b)	For the function given below, obtain the simplified expression in product of sum form using k-maps i) F(A, B, C, D) = ΣM (0, 2, 4, 6, 8, 9, 10, 11, 12, 14). ii) F(A, B, C) = $\overline{AC} + \overline{BC} + ABC$.	CO1	7 Marks
		(OR)		
4	a)	Simplify the Boolean expression F=$\Sigma_{w,x,y,z}$ 1,3,7,11,15 + d(0,2,5) using K-map and indicate the prime implicants.	CO1	7 Marks
	b)	Obtain the minimal expression for f=Σm(1,2,3,5,6,7,8,9,12,13,15) using tabulation method.	CO1	7 Marks

UNIT-III

5	a)	Design a full-subtractor using 3:8 decoders.	CO2	4 Marks
	b)	Implement the following function using 4:1 MUX $f(A, B, C, D)$ = Σm(2, 4, 5, 7, 10, 14)	CO5	5 Marks
	c)	Design an 16:1 multiplexer using NOR gates only.	CO2	5 Marks
		(OR)		
6	a)	Design a BCD to excess-3 code converter circuit.	CO4	7 Marks
	b)	Implement full subtractor using two half subtractors and justify the answer.	CO2	7 Marks

UNIT-IV

7	a)	Design and implement Mod-8 synchronous counter using T- flip-flops.	CO2	7 Marks
	b)	Draw the logical diagram of a 4-bit shift register. Explain how shift-left and shift-right operations are performed with relevant output waveforms.	CO6	7 Marks

(OR)

8	a)	With a suitable example, explain Moore and Mealy circuits.	CO3	4 Marks
	b)	Design a sequence generator to generate the sequence $0 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 1$ and avoid the lockout condition using J-K flip-flops.	CO4	10 Marks

UNIT-V

9	a)	Realize the following functions using PAL and draw the logic diagram using PAL $Y_1 (P, Q, R, S) = \Sigma m(3,5,6,7,8,11,13,14,15)$ $Y_3 (P, Q, R, S) = \Sigma m(0,1,5,6,8,9,11,13,14)$	CO2	7 Marks
	b)	Design and implement 4-bit Binary to Graycode convertor using a suitable PLA.	CO2	7 Marks

(OR)

10	a)	Explain the PAL with neat sketch.	CO2	4 Marks
	b)	Implement the following two Boolean functions with PLA $F_1 (A,B,C) = \Sigma_m (0,1,2,4,)$ $F_2 (A,B,C,) = \Sigma_m (0,5,6,7)$ $F_3 (A,B,C,) = \Sigma_m (1,3,5,6).$	CO2	10 Marks

CODE No.:16BT40101 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

CONCRETE TECHNOLOGY
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	Explain about the use, mechanism and influences on the properties fresh and hardened concrete of the following items. Also explain their influence on the durability of concrete. i) Tricalcium Aluminate. ii) Tricalcium Silicate. iii) Heat of Hydration. iv) Gel-Space Ratio.	CO1	14 Marks
	(OR)		
2	Explain in detail the influences of following aspects on the concretes: i) Interfacial Transition Zone. ii) Explain difference between angular aggregates and rounded aggregates. iii) Effect of maximum size of aggregate. iv) Explain the uses of Zone-1 and Zone-4 fine aggregates.	CO1	14 Marks

UNIT-II

3	Explain the following properties of fresh concretes: i) w/c ratio. ii) Bleeding. iii) Segregation. iv) Plastic Shrinkage.	CO2	14 Marks
	(OR)		
4	Explain the following properties of hardened concretes: i) Porosity and Permeability. ii) Interfacial Transition Zone (ITZ. iii) Honey combing. iv) Factors affecting the strength of the concrete.	CO2	14 Marks

UNIT-III

5	Explain in detail about the following NDT tests on concrete. i) Ultrasonic Pulse Velocity Test. ii) Rebound Hammer Test. iii) Core Drilling. iv) Cut and Pull Out Test (CAPO).	CO5	14 Marks
	(OR)		
6	Explain in detail the following item: i) Modulus of Elasticity of the concrete. ii) Dynamic Modulus of the concrete. iii) Poisson's Ratio. iv) Drying Shrinkage of the concrete.	CO1	14 Marks

UNIT-IV

7 Design a concrete mix using 30 percent fly ash as part replacement of cement (assume in case, if any data is not given): CO3 14 Marks

Requirements:

i) Characteristic Strength: 30MPa,
ii) Actual Standard Deviation: 4.5MPa,
iii) Type of Cement: OPC 53 Grade,
iv) Maximum Size of Aggregate: 20mm,
v) Minimum Cement Content: 320kg/m_3,
vi) Maximum w/c Ratio: 0.45,
vii) Workability: 100mm(Slump),
viii) Exposure Condition: Severe (forRCC),
ix) Minimum Grade Required for the Given Exposure Condition: M30
x) Method of Placing: Pumping,
xi) Degree of Supervision: Good,
xii) Type of Aggregate: Crushed Angular,
xiii) Maximum Cement Content(OPC): 450kg/m_3
xiv) Chemical Admixture Used: Super Plasticizer

Test data for materials:

i) Specific Gravity of Cement: 3.15,
ii) Specific Gravity of Fly Ash: 2.13,
iii) Specific Gravity of Coarse Aggregate: 2.74,
iv) Specific Gravity of Fine Aggregate: 2.64,
v) Water absorption of Coarse Aggregate: 0.4 percent,
vi) Water absorption of Fine Aggregate: 0.8 percent,
vii) Total moisture content in Coarse Aggregate: 2.8 percent,
viii) Total moisture content in Fine Aggregate: 4.6 percent,
ix) Fine Aggregate: Conforming to Grading Zone-1 of IS:383

Maximum Water Content per Cubic Meter of Concrete for Nominal Maximum Size of Aggregate and Volume of Coarse Aggregate per Unit Volume of Total Aggregate for Different Zones of Fine Aggregate

#	Nominal Max Size of Aggregate(mm)	Maximum Water Content (kg)	Volume of Coarse Aggregate per Unit Volume of Total Aggregate for			
			Zone-4	Zone-3	Zone-2	Zone-1
1.	10	208	0.50	0.48	0.46	0.44
2.	20	186	0.66	0.64	0.62	0.60
3.	40	165	075	0.73	0.71	0.69

(OR)

8	Design a concrete mix for non-air entrained concrete for the construction of pavements, using Rounded Aggregate and using ACI method. The data for the mix design is as given below: i) Required Cylindrical Strength: 40MPa, ii) Required Workability: 25mm (slump), iii) Maximum Size of Aggregate: 37.5mm iv) Water Reducing Admixture will be used. v) Durability Criteria: Structure is exposed to Sea Water vi) Dry Rodded Bulk Density of Concrete: 1650 kg/m^3 vii) Fineness Modulus of Fine Aggregate: 2.4 viii) Specific Gravity of Cement: 3.15, ix) Specific Gravity of Coarse Aggregate: 2.74, x) Specific Gravity of Fine Aggregate: 2.64, xi) Water absorption of Coarse Aggregate: 0.4 percent, xii) Water absorption of Fine Aggregate: 0.8 percent, xiii) Total moisture content in Coarse Aggregate: 2.8 percent, xiv) Total moisture content in Fine Aggregate: 4.6 percent,	CO3	14 Marks

UNIT-V

9	Write short notes on following items: i) Cellular Light Weight concreting, ii) High Strength concretes, iii) Self-Compacting concretes. iv) Light Weight Aggregate concretes,	CO1	14 Marks

(OR)

10	Write short notes on following items: i) Heavy Weight Aggregate concretes. ii) High Volume Fly Ash concretes. iii) Geo Polymer concretes. iv) Pervious concretes.	CO1	14 Marks

CODE No.:16BT40104 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

STRUCTURAL ANALYSIS - I

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

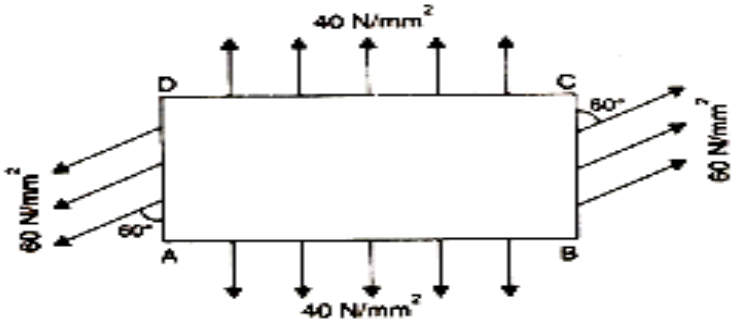
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

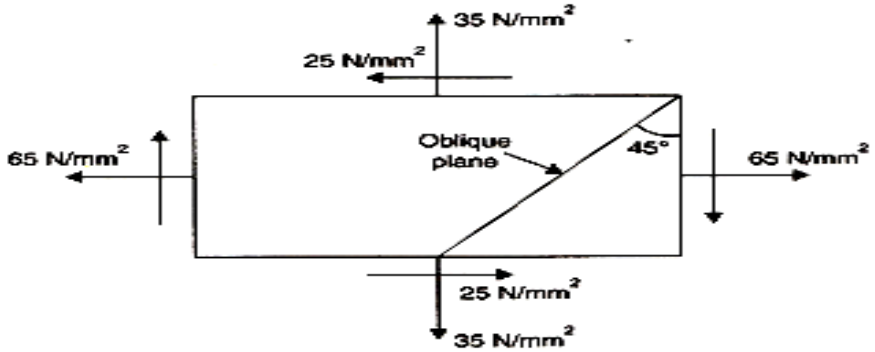
1	a)	Direct tensile stresses of 120 MPa and 70 MPa act on a body on mutually perpendicular planes. What is the magnitude of shearing stress that can be applied so that the major principal stress at the point does not exceed 135 MPa? Determine the value of minor principal stress and the maximum shear stress.	CO1	7 Marks
	b)	The magnitude of normal stress on two mutually perpendicular planes, at a point in an elastic body are 60 MPa (compressive) and 80 MPa (tensile) respectively. Find the magnitudes of shearing stresses on these planes if the magnitude of one of the principal stresses is 100 MPa (tensile). Find also the magnitude of the other principal stress at this point.	CO1	7 Marks

(OR)

2	a)	A point in a strained material is subjected to the stresses as shown in figure. Locate the principal planes and evaluate the principal stresses.	CO2	6 Marks



	b)	A point in a strained material is subjected to stress shown in figure. Using Mohr's circle method, determine the normal and tangential stresses across the oblique plane. Check the answer analytically.	CO2	8 Marks

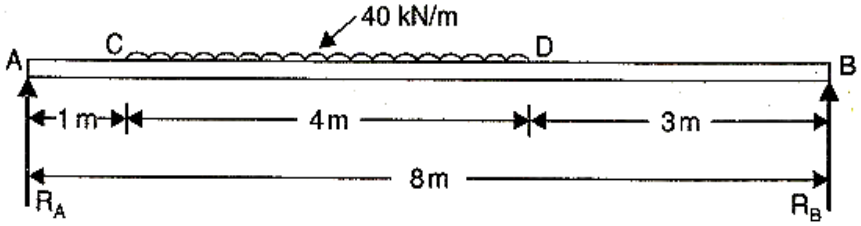


UNIT-II

3	a)	Derive the slope at supports and deflection at centre for a simply supported beam carrying uniformly distributed load of w per unit length over the entire span "L".	CO1	7 Marks
	b)	A cantilever of length L is loaded with uniformly varying load of intensity zero at the free end and w/unit length at the fixed end. Derive an expression for the deflection at any point. Find also the slope and deflection of the free end.	CO2	7 Marks

(OR)

4		A beam of length 8m is simply supported at is ends. It carries a uniformly distributed load of 40kN/m as shown in figure below. Determine: i) Deflection at D. ii) Maximum deflection. iii) Slope at end A. Take E = $2x10^5 N/mm^2$ and I = $4.3x10^8 mm^4$.	CO4	14 Marks



UNIT-III

5		What is the value of Euler's buckling load for an axially loaded pin-ended (hinged at both ends) strut of length 'l' and flexural rigidity 'EI'? What would be order of Euler's buckling load carrying capacity of a similar strut but fixed at both ends in terms of the load carrying capacity of the earlier one.	CO1	14 Marks

(OR)

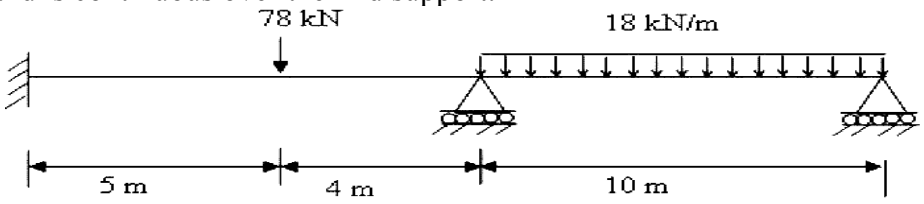
6		Euler's critical load for a column with both ends hinged is found as 40 kN. What would be the change in the critical load if both ends are fixed and one end fixed, and other end is hinged?	CO5	14 Marks

UNIT-IV

7		Analyze a propped cantilever beam AB of span "L" carrying a Uniformly Distributed Load (UDL) on entire span with magnitude of w. Draw the shear force and bending moment diagrams.	CO2	14 Marks

(OR)

8		Draw the bending moment and shear force diagrams of a beam shown in the Figure which is simply supported at one end and fixed at another end and is continuous over the mid support.	CO6	14 Marks



UNIT-V

9	a)	Explain in detail about maximum shear strain energy theory.	CO1	7 Marks
	b)	A bolt of 12mm diameter is subjected to an axial pull of 10kN and a shear force of 7.5 kN. Determine the factor of safety against failure based on maximum principal stress and maximum shear stress theories, if the yield strength of the material is 400 MPa, and Poisson's ratio is 0.3.	CO5	7 Marks

(OR)

10		A simply supported beam of a rectangular section 50mm wide and 70mm deep is subjected to an inclined load P at the mid span. The inclination of the load is 30^0 to the vertical. If the length of the simply supported beam is 4m and is maximum stress due to bending is not exceed $210MN/m^2$, Determine the value of P.	CO3	14 Marks

❀ ❀ ❀

CODE No.:16BT40105 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

WATER SUPPLY ENGINEERING
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Give reasons for the following: i) The quality of water obtained from rivers is not reliable. ii) The underground waters are generally clear and free from impurities iii) The level of water table is variable iv) Some springs discharge hot water v) The shallow wells are not suitable for public water supply.	CO1	10 Marks
	b)	What are sources of temperature increase in water bodies? What are the impacts of elevated temperatures?	CO1	4 Marks
		(OR)		
2	a)	What are the most common constituents of alkalinity? What are their sources and impact?	CO7	7 Marks
	b)	Define Chemical Oxygen Demand (COD) and Total Organic Carbon (TOC). Discuss how these and other tests are used to quantify non-biodegradable organics in water.	CO7	7 Marks

UNIT-II

3	a)	Distinguish between the following: i) Graphical method and comparative method. ii) Present population and estimated population. iii) Continuous supply system and intermittent supply system.	CO3	6 Marks
	b)	What is the principle of centrifugal pump? Explain its component parts.	CO1	8 Marks
		(OR)		
4	a)	What is meant by the term population? What are the various methods which are adopted to estimate population of each successive future decade?	CO4	7 Marks
	b)	What do you mean by logistic curve? How can its equation be framed?	CO4	7 Marks

UNIT-III

5	a)	Compare the characteristics of Slow sand filter and Rapid sand filter in detail.	CO1	8 Marks
	b)	Explain clearly the difference between chlorination and chloramination.	CO1	6 Marks
		(OR)		
6	a)	Design a rapid sand filter unit for 4.5 MLD with all its principal components.	CO3	12 Marks
	b)	What is the action of coagulants when added to raw waters?	CO1	2 Marks

UNIT-IV

7	a)	How are refractory organics removed from water and waste water?	CO1	7 Marks
	b)	What are the factors influence against effective disinfection?	CO1	7 Marks
		(OR)		

8	a)	Describe the various lay-outs of distribution network in a water supply system and state their advantages and disadvantages.	CO6	7 Marks
	b)	How is the capacity of a distribution reservoir determined? Give an example	CO6	7 Marks

UNIT-V

9		Enumerate and describe various tests to detect the wastage of water.	CO5	14 Marks

(OR)

10		Explain the designing aspects of water supply piping in a building.	CO6	14 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

ELECTRICAL MEASUREMENTS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain in detail the different types of errors in measuring instruments.	CO1	7 Marks
	b)	Describe the construction and working of a permanent magnetic moving coil instruments.	CO1	7 Marks
		(OR)		
2	a)	The resistance of a moving voltmeter is 11k Ω. The moving coil has 100 turns and is 40mm long and 30mm wide. The flux density in the air gap is 0.05 Wb/m^2. Determine the deflection produced by 220 volts if the spring control gives a defection of 1^0 for a torque of 20×10^{-7} N-m.	CO4	7 Marks
	b)	Explain the working of attraction type and repulsion type moving iron instruments with neat diagrams.	CO1	7 Marks

UNIT-II

3	a)	Explain the special features incorporated in an electrodynamometer type of wattmeter so that it can be used for low power factor applications.	CO3	7 Marks
	b)	The power input to a 3-phase induction motor is read by two watt meters. The readings are 920W and 300W. Calculate the power factor of the motor.	CO4	7 Marks
		(OR)		
4	a)	Explain the lag adjustment devices of single phase energy meter.	CO2	7 Marks
	b)	A 5A, 230V meter on full load unity power factor test makes 60 revolutions in 360 seconds. If the normal disc speed is 520 revolutions per kWh, find the percentage error.	CO4	7 Marks

UNIT-III

5		Derive expression for actual transformation ratio, ratio error and phase angle error of a P.T.	CO2	14 Marks
		(OR)		
6	a)	Explain the single phase EDM type power factor meter with neat sketch.	CO1	7 Marks
	b)	Explain the characteristics of current transformer.	CO1	7 Marks

UNIT-IV

7		Describe the working of Schering Bridge. Derive the expressions for capacitance, dissipation factor and its applications.	CO2	14 Marks
		(OR)		
8	a)	A bridge is balanced at 1,000Hz and has the following constants: AB, 0.2Mf pure capacitance; BC, 500Ω pure resistance; CD, unknown; DA, R=300Ω parallel with C = 0.1μF. Find the R and C or L constants of arm CD, considered as a series circuit.	CO6	7 Marks
	b)	Explain Anderson's bridge with phase diagram and derive its balance equations.	CO2	7 Marks

UNIT-V

9	a)	Write the difference between the DC and AC potentiometers.	CO1	7 Marks
	b)	Explain the polar type AC potentiometer.	CO1	7 Marks
		(OR)		
10	a)	Explain the block diagram of a general purpose oscilloscope and also describe about the observation of waveform on CRO.	CO1	7 Marks
	b)	Explain the ramp type digital voltmeter.	CO1	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC16) Supplementary Examinations August – 2021

TRANSFORMERS AND INDUCTION MACHINES

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the importance of V/f ratio in the operation of transformer.	CO2	8 Marks
	b)	Derive the expression for induced **emf** in a transformer.	CO1	6 Marks
		(OR)		
2	a)	Draw the exact equivalent circuit of a transformer and describe briefly the various parameters involved in it.	CO2	8 Marks
	b)	Explain suitable test to determine full load copper loss of a single phase transformer.	CO1	6 Marks

UNIT-II

3	a)	List the necessary conditions to be satisfied for parallel operation of two transformers.	CO2	5 Marks
	b)	Two transformers operating in parallel have equal voltage ratios. The magnitude of their equivalent leakage impedances are equal, but their reactance to resistance ratios are 3 and 1. Find the ratio of full load kVA delivered to the sum of their individual kVA ratings.	CO4	9 Marks
		(OR)		
4	a)	Describe the procedure of sumpner's test to determine the efficiency of transformer. Mention the limitations of this test.	CO1	8 Marks
	b)	A 10kVA 2500/250V single phase two winding transformer is used as an auto transformer to raise the supply voltage of 2500V to an output voltage of 2625V. The LV winding of the two winding transformer consists of two equal parts of 125V each. If both parts of low voltage winding are used, determine: i) auto transformer kVA output. ii) kVA transformed and conducted.	CO4	6 Marks

UNIT-III

5	a)	Explain suitable technique to obtain two phase supply from three phase supply using single phase transformers.	CO5	10 Marks
	b)	Mention few applications of on load tap changing transformers.	CO6	4 Marks
		(OR)		
6		A three phase transformer is used to step down the voltage of a three phase 11kV feeder line. Per phase turns ratio is 12. For a primary line current of 20A, Calculate the secondary line voltage, line current and output kVA for the following connections. i) Star – Delta ii) Star – Star. Neglect losses.	CO4	14 Marks

UNIT-IV

7	a)	Show that the magnitude of resultant flux remains constant throughout the air gap of three phase induction motor.	CO1	7 Marks
	b)	Compare the constructional features of squirrel cage and slip ring induction motor.	CO1	7 Marks
		(OR)		

8	a)	Derive the expression for developed torque in a three phase induction motor and find the condition for maximum torque.	CO1	7 Marks
	b)	The rotor of a three phase induction motor has 0.04Ω resistance per phase and 0.2Ω standstill reactance per phase. What external resistance is required in the rotor circuit in order to get half of the maximum torque at starting? Neglect stator impedance.	CO4	7 Marks

UNIT-V

9	a)	Describe the procedure of no load and blocked rotor test of three phase induction motor.	CO2	7 Marks
	b)	Blocked rotor test on a three phase 40kW, 400V, 50Hz 6 pole star connected induction motor gave the following data: 200V, 110A, power factor = 0.4. Determine the starting torque for a three phase voltage of 380V at 45Hz. Neglect magnetizing current and assume equal stator and rotor ohmic losses.	CO4	7 Marks

(OR)

10	a)	List various starting methods of three phase induction motors. Explain any one method in detail.	CO1	8 Marks
	b)	Explain the principle of operation of induction generator.	CO1	6 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

DESIGN OF MACHINE ELEMENTS-I

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

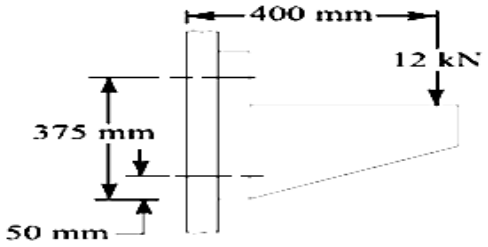
1	a)	What are the basic requirements of a machine element?	CO1	7 Marks
	b)	What are the general considerations in designing a machine component?	CO1	7 Marks
		(OR)		
2	a)	What do you understand by preferred numbers? What is their significance in design?	CO1	7 Marks
	b)	The principal stresses induced at a point in a machine component made of steel 50C4 are as follows. (S_{yt} = 460 Mpa). σ_1 = 200 *MPa*, σ_2 = 150 *MPa*, σ_3 = 0. Calculate factor of safety using maximum shear stress theory and distortion energy theory.	CO2	7 Marks

UNIT-II

3	a)	What are the factors to be considered while designing machine parts to avoid fatigue failure?	CO1	4 Marks
	b)	A machine component is subjected to a flexural stress which fluctuates between +300MN/m^2 and –150MN/m^2. Determine the value of minimum ultimate strength according to Gerber relation and Soderberg relation. Take yield strength = 0.55 Ultimate strength; Endurance strength = 0.5 Ultimate strength and factor of safety =2.	CO2	10 Marks
		(OR)		
4		A steel rod is subjected to a completely reversed axial load of 180kN. Find the diameter of the rod for a factor of safety of 2. Neglect column action. The material has an ultimate tensile strength of 1070 MPa and yield strength of 910 MPa. The endurance limit in reversed bending may be assumed to be one-half of the ultimate tensile strength. Other correction factors may be taken as follows: For axial loading = 0.7; For machined surface = 0.8; For size = 0.85; For stress concentration=1.0.	CO3	14 Marks

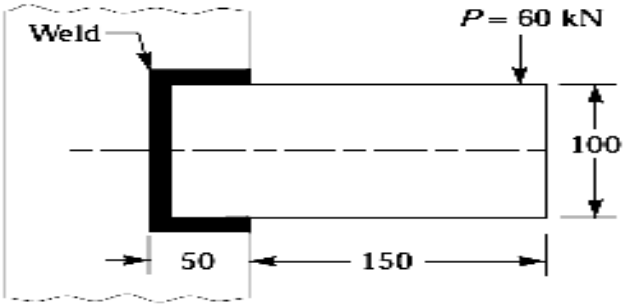
UNIT-III

5	a)	Explain the method of determining the size of bolt when the bracket carries an eccentric load perpendicular to the axis of the bolt.	CO1	4 Marks
	b)	For supporting the travelling crane in a workshop, the brackets are fixed on steel columns as shown in Figure-1. The maximum load that comes on the bracket is 12 KN acting vertically at a distance of 400mm from the face of the column. The vertical face of the bracket is secured to a column by four bolts, in two rows (two in each row) at a distance of 50mm from the lower edge of the bracket. Determine the size of the bolts, if the permissible value of the tensile stress for the bolt material is 84 MPa.	CO3	10 Marks



(OR)

6	a)	What is reinforcement in weld? What are its advantages and disadvantages?	CO1	4 Marks
	b)	A rectangular steel plate is welded as a cantilever to a vertical column and supports a single concentrated load P, as shown in Figure2. Determine the weld size, if shear stress in the same is not to exceed 140 MPa. (Dimensions are in mm).	CO4	10 Marks



UNIT-IV

7		A mild steel shaft transmits 15 kW at 210 r.p.m. It is supported on two bearings 750mm apart and has two gears keyed to it. The pinion having 24 teeth of 6mm module is located 100mm to the left of the right hand bearing and delivers the power horizontally to the right. The gear having 80 teeth of 6mm module is located 15mm to the right of the left hand bearing and receives power in a vertical direction from below. Assuming an allowable working shear stress as 53 MPa, and a combined shock and fatigue factor of 1.5 in bending as well as in torsion, determine the diameter of the shaft.	CO3	14 Marks

(OR)

8		Design and draw a protective type of cast iron flange coupling for a steel shaft transmitting 15 kW at 200 r.p.m. and having an allowable shear stress of 40 MPa. The working stress in the bolts should not exceed 30 MPa. Assume that the same material is used for shaft and key and that the crushing stress is twice the value of its shear stress. The maximum torque is 25% greater than the full load torque. The shear stress for cast iron is 14 MPa.	CO5	14 Marks

UNIT-V

9		Two rods made of plain carbon steel 40C8 (S_{yt}= 380 MPa) are to be connected by means of a cotter joint. The diameter of each rod is 50mm and the cotter is made from a steel plate of 15mm thickness. Calculate the dimensions of the socket end making following assumptions. i) The yield strength in compression is twice of the tensile yield strength. ii) The yield strength in shear is 50% of the tensile yield strength. Factor of safety= 6	CO3	14 Marks

(OR)

10		Design a knuckle joint to transmit 150 kN. The design stresses may be taken as 75 MPa in tension, 60 MPa in shear and 150 MPa in compression.	CO4	14 Marks

❀ ❀ ❀

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC16) Supplementary Examinations August – 2021

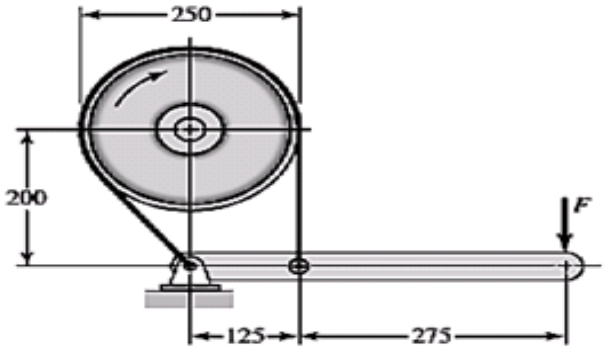
DYNAMICS OF MACHINERY
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Briefly explain about any two types of clutches with neat diagram.	CO1	4 Marks
	b)	The brake shown in figure has a coefficient of friction of 0.3 and is to operate using a maximum force of F of 400N. If the band width is 50 mm, find the band tensions and the braking torque.	CO2	10 Marks



(OR)

2	a)	What is self-energizing and self-locking brake? Explain.	CO1	6 Marks
	b)	An engine developing 30KW at 1250 r.p.m is fitted with a cone clutch. The cone face has an angle of 12.5^0. The mean diameter is 400mm, and coefficient of friction is 0.3. The normal pressure shouldn't exceed 0.08Mpa. Find inner and outer radius of clutch plate.	CO2	8 Marks

UNIT-II

3	a)	Draw the turning moment diagrams for Four stroke cycle I.C engine, neglecting the effect of inertia of the connecting rod.	CO1	5 Marks
	b)	A ship is propelled by a turbine rotor of mass 500 kg and has a speed of 2400 r.p.m. The rotor has a radius of gyration of 0.5m and rotates in clock wise when viewed from the stern. Determine the gyroscopic couple and its effect if, i) The ship runs at a speed of 28 km/hr. It steers to the left in a curve of 60 m radius. ii) The ship pitches 5^0 above and 5^0 below the horizontal position, with a time period of 20 seconds. iii) The ship rolls with an angular velocity of 0.04 rad/sec.	CO3	9 Marks

(OR)

4	a)	Discuss briefly about the stability of 2 – wheel drive, when it is taking a turn by considering weight of the vehicle, effect of centrifugal and gyroscopic couples.	CO1	4 Marks
	b)	Find the maximum and minimum speeds of a flywheel of mass 3250 kg and radius of gyration 1.8 m, when the fluctuation of energy is 112kN-m. The mean speed of the engine is 240 r.p.m.	CO3	10 Marks

UNIT-III

5	a)	Explain in detail about the functioning of centrifugal governor with neat sketch	CO1	4 Marks
	b)	All the links of the porter governor are 178mm long and are hinged at a distance of 38mm from the axis of rotation. The mass of the each ball is 1.15 kg and mass of the sleeve is 20 kg. The governor begins to rise at 280 r.p.m when the upper links are at 30^0 to the vertical. Assuming that friction is constant, determine the range of the speed if the upper arms make an angle of 45^0 to the vertical.	CO3	10 Marks

(OR)

6		A spring loaded Hartnell governor has arms of equal length. The mass rotates in a circle of 130mm diameter when the sleeve is in the mid position and the ball arms are vertical. The equilibrium speed for the position is 450 r.p.m, by neglecting the friction. The maximum sleeve movement is to be 25mm and maximum variation of speed by taking into consideration of friction to be 5% of the mid position of the speed. The mass of the sleeve is 4 kg and friction may be considered as 30N. The power of the governor must be sufficient to overcome the friction by one percent change of speed either way at the mid position. By neglecting the obliquity of the arms, determine: i) The mass of each ball. ii) The spring stiffness and. iii) The initial compression of the spring.	CO2	14 Marks

UNIT-IV

7		The firing order of a two-stroke-cycle six cylinder engine is 1–5–3–6–2–4. The adjacent cylinder center lines are 75cm apart. Each cylinder has a connecting rod 120cm long and a stroke 45cm. The mass of reciprocating parts in each cylinder is 200 kg. Determine the magnitudes of primary, secondary unbalanced forces and couples when the engine runs at 250 r.p.m.	CO4	14 Marks

(OR)

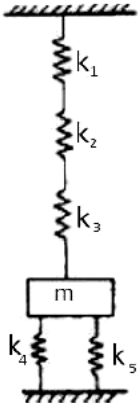
8	a)	Discuss in detail about the balancing V – twin Engine	CO1	4 Marks
	b)	Four masses A, B, C and D are completely balanced. Masses C and D make angles 90^0 and 195^0 respectively with that of mass B in the counter clock wise direction. The masses at B, C and D are 25kg, 40kg and 35kg respectively. The radii of rotation of masses A, B, C and D are 150mm, 200mm, 100mm and 180mm respectively. Planes B and C are 250mm apart. Determine: i) Mass at A and its angular position. ii) Distances of all the planes.	CO4	10 Marks

UNIT-V

9		A weight of 55N suspended by a spring of 1 N/mm is forced to vibrate by a harmonic force of 9 N. C = 77 N-sec/m. Determine: i) The resonant frequency. ii) The amplitude of mass at resonance. iii) The peak amplitude frequency. iv) The amplitude at the peak amplitude frequency.	CO5	14 Marks

(OR)

10 a) Determine the mass of the system, if K_1= 2000N/m, K_2= 1500 N/m, K_3=3000 N/m, K_4= K_5= 500 N/m and natural frequency is 10 Hz. CO1 4 Marks



b) A mass of 2 kg is supported on an isolator having a spring scale of 2940N/m and viscous damping. If the amplitude of free vibration of the mass falls to one half of its original value in 1.5 seconds, determine the damping coefficient of the isolator. CO5 10 Marks

CODE No.:16BT40303 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

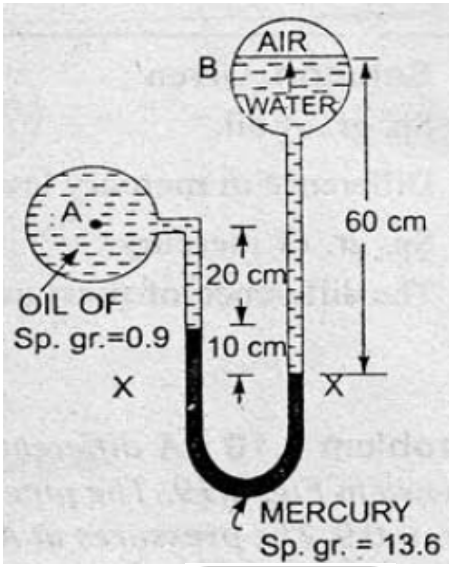
FLUID MECHANICS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the properties of fluids. 3 liter petrol weighs 21N. Calculate: i) specific weight. ii) density. iii) specific volume. iv) specific gravity.	CO1	7 Marks
	b)	A U-tube differential manometer connects two pressure pipes A and B. Pipe A contains carbon tetrachloride having a specific gravity 1.594 under a pressure of 11.772 N/ cm^2 and Pipe B contains oil of specific gravity 0.9 under a pressure of 12 N/cm^2. The pipe a lies 2.5m above pipe B. Find the difference of pressure measured by mercury as fluid filling U-tube.	CO2	7 Marks
		(OR)		
2	a)	Will you state pascal's law in your own words? What is the pressure, in meters of oil (Sp.gr. 0.8), equivalent to 80m of water?	CO1	7 Marks
	b)	A differential manometer connected at the two points A and B as shown in figure. At B air pressure is 9.81 N/cm^2 (Abs), find the absolute pressure at A.	CO2	7 Marks



UNIT-II

3	a)	Define steady, non-steady, uniform, non-uniform flows. The stream function for a two-dimensional flow is given by $\psi = 3xy$, calculate the velocity at the point P (2, 3). Find the velocity potential function Φ.	CO2	7 Marks
	b)	Water flows in a circular pipe. At one section, the diameter is 0.3m, the static pressure is 260 Kpa gauge, the velocity is 3m/s and the elevation is 10m above ground level. The elevation at a section downstream is 0m, and the pipe diameter is 0.15m. Find the gauge pressure at the downstream section. Frictional effects may be neglected. Assume density of water to be 999 kg/m^3	CO2	7 Marks
		(OR)		

4	a)	If the expression for stream function is described by $\psi = x^3 - 3xy^2$, indicate whether the flow is rotational or irrotational. If the flow is irrotational, determine the expression for velocity potential function.	CO2	7 Marks
	b)	A pitot-tube is inserted in a pipe of 300mm diameter. The static pressure in pipe is 100mm of mercury (vacuum). The stagnation pressure at the centre of the pipe, recorded by the pitot tube id 0.85N/cm^2. Calculate the rate of flow of water through pipe. If the mean velocity of flow is 0.85 times the central velocity. Take $C_v = 0.98$.	CO4	7 Marks

UNIT-III

5	a)	Derive Darcy-Weisbach formula for calculating loss of head due to friction in a pipe. Water flows through a pipe of diameter 300mm with a velocity of 5m/s. If the co-efficient of friction is given by $f = 0.015 + \frac{0.08}{\text{Re}^{0.3}}$ where Re is the Reynolds number, estimate the head lost due to friction for a length of 10m. Take kinematic viscosity of water as 0.01 stoke.	CO2	7 Marks
	b)	A 75mm diameter water jet having a velocity of 12m/s impinges on a plane. Smooth plate at an angle of 60^0 to the normal to the plate. What will be the impact when (i) the plate is stationary, and (ii) the plate is moving in the direction of the jet at 6m/s? Estimate the work done per unit time by the jet on the plate in each case. Take the density of water as 998 kg/m^3.	CO3	7 Marks

(OR)

6	a)	Derive an expression for the head loss due to sudden enlargement in pipe flow water flows through a pipe line whose diameter various from 25cm to 15cm in a length of 10m. If the Darcy-Weisbach friction factor is assumed constant at 0.018 for the whole pipe, estimate the head loss in friction when the pipe is flowing full with a discharge of 0.06m^3/sec.	CO4	7 Marks
	b)	A jet strikes tangentially a smooth curved vane moving in the same direction as the jet, and the jet gets reversed in the direction. Show that the maximum efficiency is slightly less than 60 %.	CO3	7 Marks

UNIT-IV

7	a)	Show that when runner blade angle at inlet of a Francis turbine is 90^0 and the velocity of flow is constant, the hydraulic efficiency is given by 2/ (2+tan^2 α), Where α is the vane angle.	CO5	7 Marks
	b)	Describe the following terms related to hydraulic turbines. i) Water hammer. ii) Cavitation. iii) Surge Tank. iv) Geometric similarity.	CO3	7 Marks

(OR)

8	a)	A Kaplan turbine operating under a net head of 20 m develops 16 MW with an overall efficiency of 80 %. The diameter of the runner is 4.2m, while the hub diameter is 2m and dimensionless specific speed is 3 rad. If the hydraulic efficiency is 90 %, estimate the inlet and exit angles of the runner blades at the mean blade radius if the flow leaving the runner is purely axial.	CO6	7 Marks
	b)	At a project site, the head available is 160m of water at a flow rate of 0.005m^3/s. Select and design a suitable turbine to generate power, assuming the required coefficients with justification and stating all the relevant parameters.	CO3	7 Marks

UNIT-V

9	a)	Explain the working principle of a single stage centrifugal pump with a neat sketch and also explain briefly mechanical and overall efficiencies of a centrifugal pump.	CO3	7 Marks
	b)	Describe construction and working principle of double acting reciprocating pump.	CO3	7 Marks

(OR)

10	a)	Derive an expression for the work done by the impeller of a centrifugal pump on liquid per second per unit weight of lquid. Explain briefly manometric and volumetric efficiencies of a centrifugal pump.	CO3	7 Marks
	b)	Distinguish between Reciprocating and centrifugal pumps. Explain Slip and function of air vessels?	CO3	7 Marks

CODE No.:16BT40304 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

MACHINE TOOLS AND MODERN MACHINING PROCESSES
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Draw a neat sketch of single point cutting tool indicating its complete geometry on it.	CO3	7 Marks
	b)	Discuss briefly about the following Tool Materials. i) High speed steels. ii) Cemented Carbides.	CO1	7 Marks
		(OR)		
2		Draw a Merchant's Circle diagram and derive expressions to show relationships among the different forces acting on the cutting tool and different parameters involved in metal cutting.	CO4	14 Marks

UNIT-II

3	a)	List the various work holding devices in lathe. Discuss in detail.	CO1	7 Marks
	b)	Explain the working of Engine Lathe with a neat sketch.	CO1	7 Marks
		(OR)		
4	a)	Discuss about different methods of Taper Turning.	CO1	7 Marks
	b)	Explain the working of Multi Spindle Automatic Lathe.	CO1	7 Marks

UNIT-III

5	a)	Explain the specifications and operations performed on a Slotting Machine.	CO1	7 Marks
	b)	Distinguish between Shaper and Planer.	CO2	7 Marks
		(OR)		
6	a)	Design a twist drill to perform drilling operation on regular work piece.	CO3	7 Marks
	b)	Explain the working principle of Jig Boring machine.	CO1	7 Marks

UNIT-IV

7	a)	Explain the working of Cylindrical grinding machine with a neat sketch.	CO1	7 Marks
	b)	Analyze the need for Truing of grinding wheels.	CO2	7 Marks
		(OR)		
8	a)	Classify Milling machines in detail.	CO1	7 Marks
	b)	List and explain types of milling cutters with neat sketches.	CO1	7 Marks

UNIT-V

9	a)	Analyze the importance of chip less machining process in future.	CO4	7 Marks
	b)	Explain the principle involved in Electron Beam Machining.	CO5	7 Marks
		(OR)		
10	a)	Explain the principle involved in Electro Discharge Machining with a neat sketch.	CO5	7 Marks
	b)	State the advantages of Plasma Arc Machining and its applications.	CO5	7 Marks

❀ ❀ ❀

CODE No.:16BT40305 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

THERMAL ENGINEERING - I
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the working of 4 stroke CI engine with the help of simplified sketches.	CO1	7 Marks
	b)	Distinguish between 4 stroke and 2 stroke engines.	CO2	7 Marks
		(OR)		
2	a)	Classify IC engines based on cylinder arrangement.	CO1	7 Marks
	b)	Explain briefly about: i) Heat loss. (ii) Time loss. (iii) Blow down loss factors.	CO4	7 Marks

UNIT-II

3	a)	What is meant by flame front propagation and discuss the factors affecting flame speed.	CO4	7 Marks
	b)	What is meant by detonation as applied to SI engines and discuss the factors affecting detonation.	CO2	7 Marks
		(OR)		
4	a)	Briefly explain the combustion phenomena in CI engines.	CO2	7 Marks
	b)	Discuss the factors to be considered for selecting CI engine fuel and explain about its rating.	CO2	7 Marks

UNIT-III

5	a)	What is the difference between Indicated power and Brake power and discuss different efficiencies used in the performance of IC engines..	CO2	7 Marks
	b)	A 2-stroke CI engine develops a brake power of 3.72kW. Its frictional power is 0.75 kW. Its fuel consumption is 1.8 kg/hr and works with an air fuel ratio of 20:1. The heating value of fuel is 40000 kJ/kg. Calculate: i) Indicated Power. ii) Mechanical Efficiency. iii) Air consumption per hour. iv) Indicated Thermal Efficiency. v) Brake Thermal Efficiency.	CO3	7 Marks
		(OR)		
6		A load test on a 2-stroke engine gave the following results: Speed – 450 r.p.m. Brake load = 500N, IMEP = 30 x 10^4 N/m^2, Fuel consumption = 5.5 kg/hr. Cooling water flow rate = 7 kg/min, rise in temperature of cooling water = 40°C,.Ambient temperature = 25°C, Barometric pressure = 1 bar, Air to fuel ratio by weight = 30, temperature of exhaust gases = 355°C, mean specific heat of exhaust gases = 1.05 kJ/kg K, calorific value of fuel used = 42,500 kJ/kg, bore and stroke = 22cm and 27cm respectively. No. of cylinders = 1, and brake drum dia = 1.5 m. Calculate. i) volumetric efficiency based on inlet condition, ii) mechanical efficiency, iii) heat balance sheet on hour basis.	CO3	14 Marks

UNIT-IV

7	a)	Classify the fuels and discuss their relative merits and demerits.	CO5	7 Marks
	b)	What is meant by Chemically correct air fuel mixture and derive the value of stoichiometric air fuel ratio value for Octane (C_8H_{18}) fuel.	CO4	7 Marks
		(OR)		

8	a)	Distinguish between Higher and Lower Calorific values and discuss any one method for determination of calorific value of a given solid/liquid fuel.	CO2	7 Marks
	b)	The percentage weight analysis of a fuel supplied to an IC engine is as follows: C=85%, H_2 = 15%, The air fuel ratio 13.5:1. If all the carbon is burnt either to CO or CO_2 and if there is no free oxygen in the exhaust gases, calculate volumetric analysis of the dry products of combustion.	CO5	7 Marks

UNIT-V

9	a)	Classify the compressors.	CO1	7 Marks
	b)	Explain the working of single stage reciprocating compressor with the help of P-V and T-s diagrams.	CO1	7 Marks

(OR)

10	a)	Compare Centrifugal and Axial flow compressors.	CO2	7 Marks
	b)	A single stage double-acting air compressor is required to deliver 14m^3 of air per minute measured at 1.013 bar and 15 C. The delivery pressure is 7 bar and the speed 300r.p.m. Take the clearance volume as 5% of the swept volume with the compression and expansion index of n = 1.3 Calculate: i) Swept volume of the cylinder. ii) The delivery temperature. iii) Indicated.	CO2	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

ANALOG COMMUNICATIONS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What is the major drawback in Amplitude Modulation (AM)? Explain, how we overcome that drawback by using DSB-SC.	CO1	4 Marks
	b)	An AM signal $S(t)=20(1+0.9\cos(2\pi \times 10^4 \times t))\cos(2\pi \times 10^6 \times t)$ is transmitted into free space using an antenna whose resistance is 5Ω. Sketch the spectrum of AM signal and calculate Bandwidth, Power Radiated and Modulation Efficiency.	CO4	6 Marks
	c)	Discuss how a message signal recovered from a DSB-SC wave using Coherent Detector.	CO1	4 Marks
		(OR)		
2	a)	Discuss how an envelope detector extracts original message signal from an AM signal.	CO1	6 Marks
	b)	An AM transmitter radiates 50W, when the carrier is modulated by a sinusoidal signal with modulation index of 0.707: i) Determine the modulation efficiency, Carrier Power , Sideband Power. ii) Determine the Peak Amplitude of the carrier before modulation and after modulation.	CO4	8 Marks

UNIT-II

3	a)	Explain the indirect method of generating WBFM signal.	CO1	4 Marks
	b)	Consider an angle modulated signal $S(t) = 8\cos[8\pi 10^6 t + 2\sin(8\pi 10^3 t)]$. Find the following: i) Carrier frequency. ii) Modulating signal frequency. iii) Instantaneous frequency at time: 0.5ms., and 1ms. iv) Maximum phase deviation. v) Maximum frequency deviation.	CO4	10 Marks
		(OR)		
4	a)	Consider an FM signal $f(t) = \cos[2\pi f_c t+\beta_1\sin(2\pi f_1 t)+\beta_2\sin(2\pi f_2 t)$. Find the maximum frequency deviation of the FM signal.	CO4	5 Marks
	b)	Discuss how frequency discrimination method is useful to extract message signal from FM signal.	CO1	7 Marks
	c)	Write any two differences between NBFM and WBFM.	CO1	2 Marks

UNIT-III

5		Estimate Signal to Noise ratio of a DSB-SC system.	CO2	14 Marks
		(OR)		
6		Discuss about the following. i) FM capture Effect. ii) Pre- Emphasis. iii) De-Emphasis.	CO2	14 Marks

UNIT-IV

7	a)	Discuss about Super heterodyne AM receiver with neat block diagram.	CO3	10 Marks
	b)	Compare low level and high level AM transmitters.	CO6	4 Marks

(OR)

8	a)	Discuss about the following parameters. i) Selectivity. ii) Sensitivity. iii) Fidelity.	CO3	6 Marks
	b)	Explain the importance of AGC in Super heterodyne receiver.	CO6	5 Marks
	c)	What are major problem encountered in Tuned Radio Frequency Receiver?	CO3	3 Marks

UNIT-V

9	a)	Explain the Generation and of PAM signal with neat waveforms.	CO1	8 Marks
	b)	Discuss about Time Division Multiplexing with neat block diagram.	CO2	6 Marks

(OR)

10	a)	Explain the generation and detection of PPM signal.	CO1	8 Marks
	b)	Compare TDM and FDM.	CO2	6 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations August - 2021

DIGITAL IC APPLICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the terms transition time and propagation delay with reference to CMOS logic.	CO1	7 Marks
	b)	Draw the circuit diagram, functional table and logic symbol of CMOS OR gate and explain its operation.	CO2	7 Marks
		(OR)		
2	a)	Explain the following terms with reference to TTL gate. i) Logic Levels. ii) D.C noise margin. iii) Low-state unit load. iv) High-state fan-out.	CO5	8 Marks
	b)	List out the difference between TTL, ECL and CMOS logic family.	CO6	6 Marks

UNIT-II

3	a)	Explain the following syntax with examples: i) Procedure. ii) Task. iii) Function.	CO2	9 Marks
	b)	What do you understand by gate level modeling? Explain briefly.	CO1	5 Marks
		(OR)		
4	a)	Explain verilog HDL data type.	CO4	7 Marks
	b)	Discuss different logical operators used in verilog HDL.	CO2	7 Marks

UNIT-III

5	a)	Design a 16 x 1 multiplexer using two 74 x 151 multiplexer and one 74 x 139 decoder.	CO3	8 Marks
	b)	Design a function F = ABC + (A+B+C)' by using 74 x 138 and explain its operation.	CO4	6 Marks
		(OR)		
6	a)	Write Verilog HDL program in behavioural model for 74 x 139 IC.	CO3	5 Marks
	b)	Design a 74 x 181 arithmetic and logic unit. Write a program in data flow modelling.	CO4	9 Marks

UNIT-IV

7		Design an 8-bit universal parallel-in serial out shift register with a control input. Shift left operation with control input 1 and shift-right operation with control input 0 is to be performed.	CO4	14 Marks
		(OR)		
8	a)	Explain the operation of 4-bit ring counter and draw its logic diagram.	CO2	6 Marks
	b)	Explain the operation of a 4 bit synchronous binary counter with the required diagram and waveforms.	CO2	8 Marks

UNIT-V

9	a)	List out few comparisons of SRAM verses DRAM along with advantages and disadvantages.	CO5	8 Marks
	b)	Explain architecture model of FPGA.	CO2	6 Marks
		(OR)		
10	a)	Explain the necessity of two-dimensional decoding mechanism in memories. Draw MOS transistor memory cell in ROM and explain the operation.	CO5	7 Marks
	b)	Explain the operation of synchronous SRAM with the help of internal architecture.	CO2	7 Marks

❀ ❀ ❀

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC16) Supplementary Examinations August – 2021

ELECTROMAGNETIC THEORY AND TRANSMISSION LINES

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Analyse mathematically the *direction* and *magnitude* of E in terms of the potential V and hence deduce that E = - grad V.	CO1	7 Marks
	b)	The potential field at the point $\boldsymbol{P(r, \theta, \varphi)}$ **is** $\boldsymbol{V = (10/r^2)\ \sin\theta \cos\varphi}$. Evaluate the value of electric flux density D at $\boldsymbol{(2, \pi/2, 0)}$.	CO4	7 Marks
		(OR)		
2	a)	An infinitely long straight filament carrying a direct current $\boldsymbol{I}$ is placed along z-axis. Apply Biot-Savart's law to calculate the value of magnetic field intensity H at the point (ρ, φ, z).	CO1	7 Marks
	b)	An infinitely long filamentary conductor, which carries a current $\boldsymbol{I}$ = 5.0 A, is placed parallel to the y-axis at x = 2m and z = – 2m. Calculate the magnetic field intensity H at (0, 0, 0).	CO4	7 Marks

UNIT-II

3	a)	In a material for which σ = 5.0 S/m and ϵ_r = 1, the electric field intensity is E = 250 sin $10^{10}t$ (V/m). Calculate the *conduction* and *displacement* current densities, and the frequency at which both have equal magnitudes.	CO2	7 Marks
	b)	Develop the Maxwell's equation, $\nabla \times E = -\frac{\partial B}{\partial t}$ from Faraday's law of electromagnetic induction.	CO1	7 Marks
		(OR)		
4	a)	Develop the boundary conditions on *tangential* and *normal components* of time varying electric field E, across the interface between two media with constants μ_1, ϵ_1 and μ_2, ϵ_2.	CO1	7 Marks
	b)	Derive the Maxwell's equations in integral form, from differential form for time harmonic fields, and describe the physical meaning of integral forms.	CO2	7 Marks

UNIT-III

5	a)	Define *polarization* of a wave, and describe mathematically *linear*, *elliptical* and *circular* polarizations with illustrating diagrams.	CO6	7 Marks
	b)	Derive the expressions for α and β in terms of the constants of the medium μ, ϵ and σ for a *uniform plane wave* propagating in a lossy conducting medium.	CO5	7 Marks
		(OR)		
6	a)	What is Poynting vector? Prove Poynting theorem from first principles.	CO5	7 Marks
	b)	Derive the expressions for α, β, v_p and η for the wave propagating in a good dielectric medium.	CO6	7 Marks

UNIT-IV

7	a)	Obtain the equations for attenuation and phase constants of a transmission line in terms of R, L, C and G.	CO3	7 Marks
	b)	Derive the condition for distortion less line and hence justify how the *frequency* and *phase* distortions can be eliminated on a transmission line at low frequency.	CO2	7 Marks
		(OR)		

8	a)	The constants of a transmission line are R=6 Ω/km, L=2.2 mH/km G=0.25x10^{-3}mho/km, C=0.005μf/km. Find the attenuation constant, phase shift constant at 1000Hz.	CO3	7 Marks
	b)	Define propagation constant. Obtain the expressions for the wavelength and velocity of propagation of voltage and current waves a transmission line.	CO2	7 Marks

UNIT-V

9	a)	Discuss the concept of Single stub matching.	CO1	7 Marks
	b)	Define VSWR. Deduce the relation between VSWR and reflection coefficient.	CO4	7 Marks

(OR)

10	a)	The characteristic impedance of a certain line is $710\angle 14^{o}\,\Omega$ and propagation constant of 0.007+j0.028 per km. the line is terminated in a 300Ω resistor. Calculate the input impedance of the line if its length is 100 km.	CO1	7 Marks
	b)	A single stub is to match a 40Ω line to a load of 200-j100Ω. The wavelength is 3.0 meters. Determine the shortest distance from the load to the stub location and the proper length of the short-circuited stub.	CO4	7 Marks

CODE No.:16BT40404 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

LINEAR IC APPLICATIONS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the AC characteristics of an Op-amp.	CO1	7 Marks
	b)	For an Op-amp, CMRR=10dB, difference mode gain A_d=100. The output voltage changes by 20v in 4μsec. Calculate i) Common Mode Gain (A_c); ii) Slew Rate.	CO4	7 Marks
		(OR)		
2	a)	Why a level translator is needed in an Op-amp circuit? Explain different level translator circuits.	CO1	6 Marks
	b)	Why Compensation technique is implemented in an Op-amp? Explain the concept of Pole-Zero Compensation technique.	CO2	8 Marks

UNIT-II

3	a)	Derive the relationship between input and output of an Inverting amplifier using 741 Op-amp in both ideal and practical conditions.	CO2	7 Marks
	b)	Explain the operation of Full wave rectifier using 741 Op-amp.	CO2	7 Marks
		(OR)		
4	a)	Explain how log operations are performed by using 741 Op-amp.	CO1	7 Marks
	b)	Design a Triangular Wave generator for the following specifications: V_0=10V_{P-P} and f_0= 1 KHz.	CO4	7 Marks

UNIT-III

5	a)	Explain how an IC voltage regulator works.	CO1	7 Marks
	b)	Explain the working of Series Op-amp regulator.	CO1	7 Marks
		(OR)		
6	a)	Why the Narrow Band Pass filter is called as notch filter? Explain.	CO1	7 Marks
	b)	Design a first order Low Pass Butterworth filter with a cut-off frequency of 3 KHz and pass band gain of 3.	CO4	7 Marks

UNIT-IV

7	a)	How can pulse width modulation be achieved using 555 timer?	CO5	6 Marks
	b)	Design an astable multivibrator to generate a: i) 50% duty cycle. ii) 70% duty cycle.	CO4	8 Marks
		(OR)		
8	a)	A PLL has free running frequency f_C = 400 KHz low pass filter bandwidth of 10 KHz. If an input signal frequency applied is 500 KHz, will the loop acquire lock? Find the VCO output frequency.	CO4	9 Marks
	b)	Explain the role of low pass filter in PLL.	CO1	5 Marks

UNIT-V

9	a)	Determine the full scale voltage and resolution of 4-bit DAC for V_{REF}=12V and 2R=R=10 KΩ.	CO4	6 Marks
	b)	LSB of a 9-bit DAC is represented by 19.6mV. If an input of all zero bits is represented by 0V. i) Find the output of DAC for an input, 101101101 and 011011011. ii) What is the Full Scale Reading (FSR) of this DAC?	CO4	8 Marks
		(OR)		
10	a)	Explain the operation of Dual Slope ADC with a neat sketch.	CO1	7 Marks
	b)	A dual slope ADC uses a 16-bit counter and a 4 MHz clock rate. The maximum input voltage is +10V. The maximum integrator output voltage should be -8V when the counter has cycled through 2^n counts. The capacitor used in the integrator is 0.1μF. Find the value of the resistor R of the integrator. If the analog signal voltage is +4.129 V, find the equivalent digital number.	CO4	7 Marks

CODE No.:16BT40405 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

PROBABILITY AND STOCHASTIC PROCESS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define Baye's theorem and prove the theorem.	CO1	7 Marks
	b)	There are 4 candidates for the office of the highway commissioner. The respective probabilities that they will be selected are 0.3, 0.2, 0.4 and 0.1 and the probabilities for a project approval are 0.35, 0.85, 0.45 and 0.15, depending on which of the four candidates are selected. What is the probability of the project getting approved?	CO3	7 Marks
		(OR)		
2	a)	In a certain group of engineer's 60% have insufficient background of information theory, 50% have inadequate knowledge of probability and 80 % are in either one or both of two adequate categories. What is the percentage of people who have adequate knowledge of probability among those who have a sufficient background of information theory?	CO3	7 Marks
	b)	Explain statistical independence of events. If A_1 and A_2 are statistically independent, then prove that $\bar{A}_2$ is independent of A_1.	CO1	7 Marks

UNIT-II

3	a)	The density function of a random variable X is given by $f(x) = \begin{cases} 2e^{-2x}; 0 \le x, \infty \\ 0; \quad otherwise \end{cases}$. Find (i) E(X). (ii) E(4X-1). (iii) $E(X^2)$. (iv) $E((X-1)^2)$.	CO3	8 Marks
	b)	Prove that a linear transformation of Gaussian random variable produces Gaussian random variable?	CO2	6 Marks
		(OR)		
4	a)	Define probability distribution function. Consider the experiment of tossing four fair coins. The random variable X is associated with number of tails showing. Compute and sketch the cumulative distribution function of X.	CO2	7 Marks
	b)	Define uniform density function and deduce mean, mean square value and variance for it.	CO2	7 Marks

UNIT-III

5	a)	Given $f_{XY}(x,y) = u(x)u(y)xe^{-x(y+1)}$ then find the marginal density functions of X and Y and conditional density functions.	CO2	7 Marks
	b)	Random variables X and Y have respective density functions $f(x) = \frac{1}{a}[u(x) - u(x-a)]$ $f_Y(y) = bu(y)e^{-by}$ a > 0, b > 0. Find the density function of W = X + Y, if X and Y are stastically independent.	CO2	7 Marks
		(OR)		

6	a)	Let X and Y have joint density function. $f_{XY}(x,y) = \left\{ \begin{array}{l} x+y; 0 \le x \le 1, 0 \le 1 \\ 0; \textit{for any other values} \end{array} \right\}$. Find the conditional expectation of X given Y and Y given X.	CO2	7 Marks
	b)	Gaussian random variables X_1 and X_2 for which $\overline{X_1} = 2, \overline{X_2} = -1, \sigma^2_{X_1} = 9, \sigma^2_{X_2} = 4$ and $C_{X_1X_2} = -3$ are transformed to new random variables Y_1 and Y_2 according to $Y_1 = -X_1 + X_2$ and $Y_2 = 0\,2X_1 - 3X_2$. Find $C_{Y_1Y_2}$ and $\rho_{Y_1Y_2}$.	CO3	7 Marks
		UNIT-IV		
7	a)	Define a Kth order stationary random processes. When, it will become strict sense stationary random processes.	CO2	7 Marks
	b)	The autocorrelation function of a stationary process is $R_{xx}(\tau) = 25 + \frac{4}{1+6\tau^2}$ then find the mean and variance of the process.	CO3	7 Marks
		(OR)		
8	a)	Define auto correlation function and write its properties.	CO2	7 Marks
	b)	Explain Gaussian random processes.	CO2	7 Marks
		UNIT-V		
9	a)	Define noise and classify different types of noise and explain them briefly.	CO4	7 Marks
	b)	Develop the expression for noise voltage when resistors are connected in series and parallel modes.	CO4	7 Marks
		(OR)		
10		Develop the expression for Noise Figure and Noise Temperature for cascaded stages of N amplifiers.	CO4	14 Marks

CODE No.:16BT40406 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

PULSE AND DIGITAL CIRCUITS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

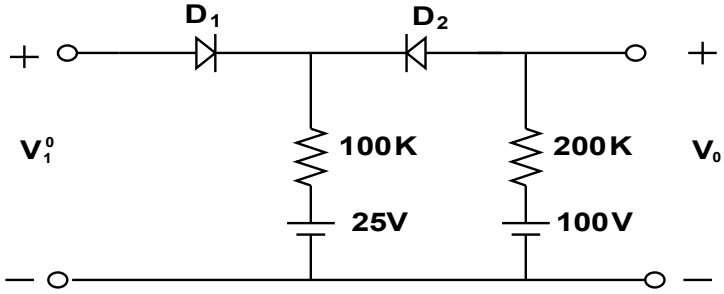
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Find and sketch the steady state response of RC high pass filter for sinusoidal input.	CO1	7 Marks
	b)	What is the need of compensating the attenuator?	CO1	7 Marks
		(OR)		
2	a)	An ideal 1μsec pulse is fed to an amplifier. Calculate and plot the output waveform under the following conditions: the upper 3 db frequency is i) 10 MHz. (ii) 1 MHz.	CO1	7 Marks
	b)	Derive the expression for percentage of tilt when an RC high pass filter is excited by a square wave?	CO2	7 Marks

UNIT-II

3	a)	What are the limitations of diode as a shunt element in clipping circuits?	CO3	7 Marks
	b)	Explain the operation of a comparator circuit.	CO2	7 Marks
		(OR)		
4	a)	What is the effect of diode forward and reverse resistances on the operation of a clipping circuit?	CO3	7 Marks
	b)	The input voltage v_i to the two level clippers varies linearly from 0 to 150V. Sketch the output voltage v_o to the same time scale as the input voltage. Assume ideal diodes.	CO2	7 Marks



UNIT-III

5		Derive the expressions for UTP and LTP of a Schmitt trigger circuit.	CO4	14 Marks
		(OR)		
6	a)	Explain the method of symmetrical triggering of the binary.	CO3	7 Marks
	b)	Derive the expression for pulse width of a monostable multivibrator.	CO3	7 Marks

UNIT-IV

7	a)	Derive the expression $e_s = 8e_d = 2e_t$ with respect to sweep circuits.	CO3	7 Marks
	b)	Derive the expression for frequency of oscillations in UJT relaxation oscillator.	CO3	7 Marks
		(OR)		
8	a)	How to apply Miller principle to generate sweep voltage?	CO5	7 Marks
	b)	What is linearity correction through adjustment of driving waveform?	CO4	7 Marks

UNIT-V

9	a)	Explain the operation of sampling gate.	CO1	7 Marks
	b)	Compare the performances of unidirectional and bidirectional sampling gates in all respects.	CO1	7 Marks
		(OR)		
10	a)	What are the applications of sampling gates?	CO1	7 Marks
	b)	Draw the circuit diagram of CMOS NAND gate and explain its operation.	CO1	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

COMPUTER GRAPHICS
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Differentiate random scan and raster scan methods.	CO1	4 Marks
	b)	Using midpoint circle algorithm, generate points on the circle with center (5, 5) and radius 5 units.	CO3	10 Marks
		(OR)		
2	a)	Apply the Bresenham's algorithm to turn up pixels along the line segment determined by points (20, 10) and (30, 18).	CO3	10 Marks
	b)	Explain Flat-panel displays with neat diagram.	CO1	4 Marks
		UNIT-II		
3	a)	Explain 2-D scaling and shear transformations with examples.	CO2	7 Marks
	b)	Write a boundary-fill procedure to fill an 8-connected region.	CO4	7 Marks
		(OR)		
4	a)	Develop flood fill algorithm to fill the interior of any specified area.	CO4	7 Marks
	b)	Determine a sequence of basic transformations that are equivalent to the y-direction shearing matrix.	CO2	7 Marks
		UNIT-III		
5	a)	Determine the equation of the Bezier curve for five control points. Evaluate the point at u = 0.5 where **u** is the normalized parameter.	CO6	8 Marks
	b)	Write a procedure to implement Cohen-Sutherland line clipping algorithm.	CO3	6 Marks
		(OR)		
6	a)	Illustrate Sutherland Hodgeman Polygon clipping algorithm with a neat example.	CO1	8 Marks
	b)	Enumerate the properties of BSpline and Beizer Curves.	CO1	6 Marks
		UNIT-IV		
7	a)	Prove that two successive rotations about any one of the coordinate axes in 3D is commutative.	CO2	8 Marks
	b)	Write short notes on 3D clipping.	CO2	6 Marks
		(OR)		
8	a)	Explain 3D Translation and Shearing Transformations with an example	CO1	8 Marks
	b)	Differentiate parallel projection and perspective projections.	CO1	6 Marks
		UNIT-V		
9	a)	Implement the depth-buffer method to display the visible surfaces of a given polyhedron.	CO5	8 Marks
	b)	Explain Phong shading technique with an example.	CO1	6 Marks
		(OR)		
10	a)	Explain any two backface detection methods with examples	CO1	8 Marks
	b)	Compare and Contrast Gouraud Shading and Phong shading	CO2	6 Marks

❀ ❀ ❀

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC16) Supplementary Examinations August – 2021

DATABASE MANAGEMENT SYSTEMS
[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Compare data models? Explain network, hierarchical and relational model in detail.	CO1	7 Marks
	b)	Analyze the responsibilities of DBA and database designers.	CO1	7 Marks
		(OR)		
2	a)	Describe in detail about Entity integrity and Referential Integrity in detail.	CO1	7 Marks
	b)	Consider an E-R diagram for a car-insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents. State any assumptions you make.	CO3	7 Marks

UNIT-II

3	a)	Discuss the various update operation on relation and types of integrity constraints that must be checked for each update operation.	CO3	7 Marks
	b)	What is role of participation? When is it necessary to use role names in description or relation types?	CO3	7 Marks
		(OR)		
4	a)	Explain the integrity constraints supported by SQL.	CO5	7 Marks
	b)	What is relational algebra? Discuss the various operations of relational algebra.	CO2	7 Marks

UNIT-III

5	a)	Give a detailed description about query processing and optimization.	CO4	7 Marks
	b)	Write short notes on the following: i) Order by clause and LIKE operator. ii) Set operators.	CO3	7 Marks
		(OR)		
6	a)	Differentiate functional dependency and multi valued dependency with example.	CO1	7 Marks
	b)	Explain 4NF and 5NF with an example.	CO2	7 Marks

UNIT-IV

7	a)	Explain time stamp based protocols for Concurrency Control.	CO5	7 Marks
	b)	What are the different types of lockings? In multiple-granularity locking, what is the difference between implicit and explicit locking?	CO4	7 Marks
		(OR)		
8	a)	Distinguish serial schedule and serializable schedule. Give relevant example.	CO3	7 Marks
	b)	What are checkpoints? Explain the purpose of checkpoints mechanism. How often should check points be performed?	CO3	7 Marks

UNIT-V

9	a)	What is the difference between conflict serializability and view serializability? Explain in detail with an example.	CO4	7 Marks
	b)	Briefly discuss ACID property with an example.	CO4	7 Marks
		(OR)		
10	a)	Define B+ Tree file organization in detail.	CO5	7 Marks
	b)	Identify a B+ tree to insert the following key elements (order of the tree is 3) 5,3,4,9,7,15,14,21,22,23.	CO5	7 Marks

❀ ❀ ❀

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC16) Supplementary Examinations August – 2021

INDUSTRIAL INSTRUMENTATION - I
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Give three different units of force and summarize different force sensing mechanisms.	CO2	7 Marks
	b)	Elaborate on the working principle of torque measurement based on Relative angular twist.	CO1	7 Marks
		(OR)		
2		Explain the following. i) Hydrostatic. ii) Analysis and selection of torque sensors.	CO2	14 Marks
		UNIT-II		
3	a)	Define relative acceleration. Explain the construction of piezoelectric type accelerometer in detail.	CO2	7 Marks
	b)	Elaborate on the principle of gyroscope and explain three axis gyro.	CO2	7 Marks
		(OR)		
4	a)	Identify an appropriate sensor for measurement of velocity which consume very little power and explain in detail.	CO4	7 Marks
	b)	Explain the principle and operation of tachogenerators.	CO2	7 Marks
		UNIT-III		
5	a)	What is absolute pressure? With neat sketch, explain momentum transfer gauge.	CO2	7 Marks
	b)	Elaborate on manometer and its types.	CO2	7 Marks
		(OR)		
6	a)	With neat sketch, explain Mcleod gauge and Knudsen gauge.	CO2	7 Marks
	b)	Analyze the requirements for selection of pressure sensors.	CO3	7 Marks
		UNIT-IV		
7	a)	List the merits and demerits of thermopile and thermocouple. With neat sketch, explain them in detail.	CO4	7 Marks
	b)	Elaborate on thermocouple burnout detection and high temperature measurement methods.	CO2	7 Marks
		(OR)		
8	a)	Analyze 2-wire, 3-wire and 4-wire lead resistance methods.	CO1	7 Marks
	b)	Explain thermoelectric effects and thermocouple laws.	CO2	7 Marks
		UNIT-V		
9	a)	Analyze different temperature sensors.	CO2	7 Marks
	b)	Explain about fiber optic thermometer with neat sketch.	CO1	7 Marks
		(OR)		
10	a)	Explain about calibration and simulation for temperature sensors.	CO1	7 Marks
	b)	Elaborate on Johnson noise thermometer.	CO2	7 Marks

❀ ❀ ❀

CODE No.:16BT41002 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

LINEAR AND DIGITAL ICS

[Electrical and Electronics Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Derive the expression for gain of an op-amp to be used as Inverting Amplifier and Non-Inverting amplifier with negative feedback.	CO1	7 Marks
	b)	For 741 op-amp, the parameters given are: i) I_{CQ} = 10μA; ii) C_c =33pf. The input voltage V_{pp}=12V. Estimate the slew rate and maximum possible frequency of input voltage that can be applied to get undistorted output.	CO1	7 Marks
		(OR)		
2	a)	Discuss the concept of active load to improve the CMRR.	CO1	8 Marks
	b)	Calculate the operating points of the differential amplifier with R_C = 3.9 Kohms, R_E=3.3 Kohms, V_{CC} = 9V and $-V_{EE}$ = -9V.	CO4	6 Marks

UNIT-II

3	a)	Why practical integrator is needed over ideal integrator? Justify.	CO2	7 Marks
	b)	Design the practical differentiator circuit that will differentiate an input signal with f_{max}=150Hz.	CO3	7 Marks
		(OR)		
4	a)	Design a band pass filter for f_L=100Hz and f_h=1KHz. Also calculate the quality factor.	CO3	6 Marks
	b)	Discuss the characteristics and limitations of op-amp comparator and give basic differences between comparator and Schmitt trigger.	CO6	8 Marks

UNIT-III

5	a)	List out the performance parameters of DAC and describe the operation of Binary weighted resistors DAC and R/2R ladder DAC.	CO6	7 Marks
	b)	List out the features of 555 timer and derive the expression for frequency in Astable configuration. Design 555 timer for a square wave generator with 50% duty cycle.	CO5	7 Marks
		(OR)		
6	a)	Indicate the importance of Sample and Hold Circuit. Give the applications of Sample and Hold Circuit.	CO5	5 Marks
	b)	Elaborate the functioning of a successive approximation A/D converter.	CO1	9 Marks

UNIT-IV

7	a)	Discuss about CMOS steady state and dynamic electrical behavior.	CO1	7 Marks
	b)	List out some of the user defined primitives in Verilog HDL.	CO6	7 Marks
		(OR)		
8	a)	Elaborate the importance of CMOS technology and discuss about CMOS logic families.	CO2	7 Marks
	b)	Distinguish Behavioral and structural modelling in Verilog HDL.	CO2	7 Marks

UNIT-V

9	a)	Design 8:1 multiplexer with 4:1 multiplexers and 2:1 multiplexer.	CO3	7 Marks
	b)	Develop Verilog code for 3-bit up counter.	CO4	7 Marks
		(OR)		
10	a)	Design 8-bit adder using 74 x 283 IC's and give the operation in detail.	CO5	7 Marks
	b)	Develop HDL code for 16:4 encoders.	CO4	7 Marks

❀ ❀ ❀

CODE No.:16BT41041 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

COMPUTER ARCHITECTURE AND ORGANIZATION
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the basic operational concepts of 8085 microprocessor.	CO1	7 Marks
	b)	Explain the functional units of a computer with neat sketch.	CO1	7 Marks
		(OR)		
2	a)	What is a DRAM? Explain the types of DRAM's with suitable diagrams.	CO3	7 Marks
	b)	Analyze the memory hierarchy in terms of speed, size and cost.	CO1	7 Marks

UNIT-II

3		Draw the pin diagram of 8085 and explain the function of each pin in detail.	CO1	14 Marks
		(OR)		
4		Explain 8085 data transfer instructions with a suitable example.	CO2	14 Marks

UNIT-III

5	a)	What is meant by addressing mode? Explain the different types of addressing modes.	CO1	7 Marks
	b)	Differentiate between software and hardware interrupts.	CO1	7 Marks
		(OR)		
6	a)	Write an 8085 program to arrange an array of data in descending order.	CO3	7 Marks
	b)	Distinguish between the memories mapped I/O and peripheral I/O.	CO4	7 Marks

UNIT-IV

7		Design a bus system for four registers using multiplexers.	CO3	14 Marks
		(OR)		
8	a)	Design a 4 bit combinational circuit for shifting bits to the right or to the left.	CO3	7 Marks
	b)	Compare RISC and CISC processors.	CO2	7 Marks

UNIT-V

9		What are the pipeline conflicts that cause the instruction pipeline to deviate from its normal operation?	CO1	14 Marks
		(OR)		
10		Develop an algorithm to perform addition and subtraction operation explains with an example.	CO5	14 Marks

❀ ❀ ❀

CODE No.:16BT41201 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

DESIGN AND ANALYSIS OF ALGORITHMS
[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What are asymptotic notations? Describe the notations in detail with suitable examples.	CO1	7 Marks
	b)	Design an algorithm to find the solution for Towers of Hanoi problem using recursion.	CO3	7 Marks
		(OR)		
2	a)	Describe performance of algorithms with respect to Time and Space complexities.	CO2	7 Marks
	b)	Illustrate the specifications in writing algorithms.	CO1	7 Marks

UNIT-II

3	a)	What are Bi-connected components? Give example.	CO1	7 Marks
	b)	Write the algorithms for Union and Find.	CO2	7 Marks
		(OR)		
4	a)	Describe DFS algorithm with suitable example.	CO2	7 Marks
	b)	Describe BFS algorithm with suitable example.	CO2	7 Marks

UNIT-III

5	a)	Derive time complexity of Strassen's matrix multiplication	CO4	4 Marks
	b)	Given three objects with profits $(P_1,P_2,P_3)=(25,24,15)$ and weights $(W_1,W_2,W_3)=(18,15,10)$. Find a greedy solution to place the objects in a bag of capacity 20 and earn maximum profit. Also write the algorithm.	CO1	10 Marks
		(OR)		
6	a)	Write the control abstraction for divide and conquer	CO4	4 Marks
	b)	Sort the following elements using merge sort algorithm. Also write the algorithm with Tree calls representation.	CO4	10 Marks

41	11	3	9	16	2	10	14	8	7

UNIT-IV

7	a)	State **n** queens problem. Solve the problem using backtracking. Also mention the algorithm steps in solving the problem.	CO5	7 Marks
	b)	Write an algorithm for Optimal binary search tree.	CO5	7 Marks
		(OR)		
8	a)	What is dynamic programming? Explain.	CO5	4 Marks
	b)	Solve the following Travelling Salesman Problem (TSP) by the method of dynamic programming. Here 1, 2, 3, 4 represents different cities and each cell value is the distance between corresponding two cities. Also explain the procedure of TSP.	CO1, CO5	10 Marks

	1	2	3	4
1	0	10	15	20
2	5	0	9	10
3	6	13	0	12
4	8	8	9	0

UNIT-V

9	a)	Define and give examples for E-node, Live node and Dead nodes.	CO1	4 Marks
	b)	Solve 15 puzzle problems using state space tree.	CO1	10 Marks
		(OR)		
10	a)	Write the differences between back tracking and branch and bound techniques using example.	CO1	7 Marks
	b)	Give the examples for NP-hard and NP-complete problems. Also Justify your selection.	CO1	7 Marks

CODE No.:16BT41202 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

JAVA PROGRAMMING

[Computer Science and Engineering, Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	List and explain Java buzzwords. Which factors are making Java famous language?	CO1	10 Marks
	b)	Write about garbage collections.	CO1	4 Marks
		(OR)		
2	a)	Explain control structures in Java with examples.	CO1	7 Marks
	b)	Differentiate method overloading with method overriding with examples.	CO2	7 Marks

UNIT-II

3	a)	What do you mean by static class and static method? Can we make an instance of an abstract class? Justify your answer with an example.	CO3	6 Marks
	b)	Describe how to implement the concept of multiple inheritances with example.	CO3	8 Marks
		(OR)		
4	a)	How to create packages and use them in java?	CO1	7 Marks
	b)	Explain Defining, extending, implementing interfaces with example.	CO2	7 Marks

UNIT-III

5	a)	What is thread synchronization? Discuss with an example.	CO2	8 Marks
	b)	What is the use of finally block? Explain.	CO2	6 Marks
		(OR)		
6	a)	What is the difference between process and thread?	CO1	6 Marks
	b)	What is an error? Explain different types of errors in Java.	CO2	8 Marks

UNIT-IV

7	a)	Explain applet life cycle with neat diagram.	CO4	8 Marks
	b)	Differentiate between swing components and AWT components.	CO4	6 Marks
		(OR)		
8	a)	Discuss the applet structure and compare it with application structure.	CO4	7 Marks
	b)	What is an Event? Explain the role of Event handler in AWT.	CO4	7 Marks

UNIT-V

9	a)	Explain delegation event model in detail.	CO5	7 Marks
	b)	What is a java servlet? Explain with a neat illustration the life cycle of a servlet.	CO5	7 Marks
		(OR)		
10	a)	List and explain the different situations in which the Action Event is generated. Develop the event handler for the Action Event.	CO5	9 Marks
	b)	Explain the procedure to deploy a Servlet in Tomcat Server.	CO5	5 Marks

CODE No.:16BT41203 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

SOFTWARE ENGINEERING
[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the spiral model. What is the task region in the spiral model? How does the customer wins by getting the system or product that satisfy the majority of the customer's needs and the developer wins by working to realistic and achievable budgets and deadline?	CO1	7 Marks
	b)	What are the major differences between system engineering and software engineering? State explains the stages that distinguish the two.	CO1	7 Marks
		(OR)		
2	a)	Explain the Evolutionary and Incremental Model. What are the advantages and disadvantages?	CO1	7 Marks
	b)	Give at least FIVE reasons for prototyping is problematic.	CO1	7 Marks

UNIT-II

3	a)	What is the prototyping technique? How prototype models are prepared for a software process? Discuss.	CO2	7 Marks
	b)	Draw a DFD and CFD of a test monitoring system for Gas Turbine.	CO2	7 Marks
		(OR)		
4	a)	What is requirement engineering? State its process and explain requirements elicitation problem.	CO2	7 Marks
	b)	Why the customer interaction is a difficult process? Explain one formal procedure used for customer interaction.	CO2	7 Marks

UNIT-III

5	a)	Briefly explain the use of global variables in context of coupling cohesion.	CO3	7 Marks
	b)	What is transform mapping? Explain the process with an illustration. What is its strength and weakness.	CO3	7 Marks
		(OR)		
6	a)	What are the benefits of horizontal partitioning?	CO3	7 Marks
	b)	Describe the golden rules for interface design.	CO3	7 Marks

UNIT-IV

7	a)	How the RST condition is verified in black box testing? Explain with example.	CO4	7 Marks
	b)	What are the attributes of a good test? Explain the test case design.	CO4	7 Marks
		(OR)		
8	a)	Explain the testing objectives and its principles.	CO4	7 Marks
	b)	Explain automated testing tools. How test cases are generated? Discuss when to stop testing. What is performance testing? Describe.	CO4	7 Marks

UNIT-V

9	a)	Explain in detail about Process Improvement.	CO6	7 Marks
	b)	Explain in detail business process reengineering.	CO6	7 Marks
		(OR)		
10	a)	Propose RMMM plan for Staff inefficiency risk while developing a software project.	CO6	7 Marks
	b)	What are all the formulas for cyclomatic complexity? Calculate cyclomatic Complexity for greatest of three numbers.	CO4	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

THEORY OF COMPUTATION

[Information Technology, Computer Science and Systems Engineering]

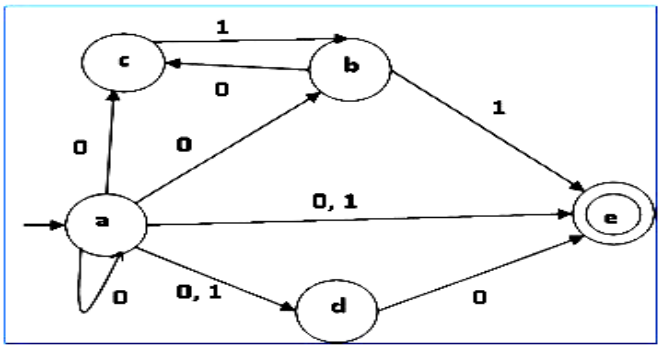
Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) What are the differences between DFA and NDFA? CO1 7 Marks

b) Let us consider the NDFA shown in the figure below. Find its equivalent DFA. CO1 7 Marks



(OR)

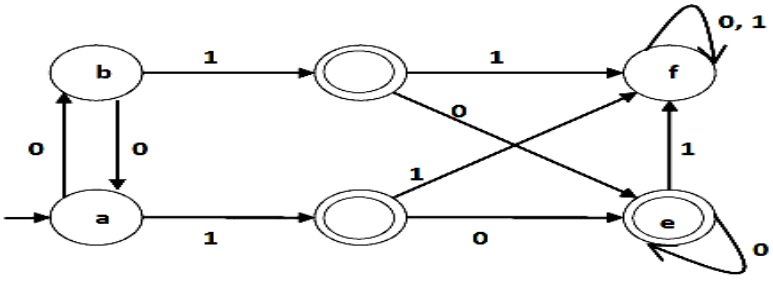
2 a) Define the closure properties of NFA. CO1 7 Marks

b) Conversion from Mealy to Moore Machine for the following table. CO2 7 Marks

	Input = 0		Input = 1	
Present State	Next State	Output	Next State	Output
q_0	q_1	0	q_2	0
q_1	q_1	0	q_2	1
q_2	q_1	1	q_2	0

UNIT-II

3 a) State and explain DFA Minimization using Myphill-Nerode theorem with the following example CO2 7 Marks

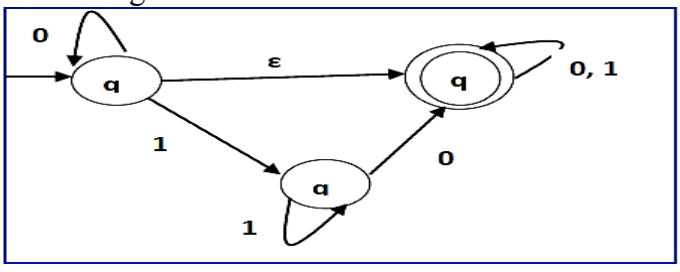


b) Explain the properties of Regular Sets. CO2 7 Marks

(OR)

4 a) Prove that $\mathbf{L = \{a^i b^i \mid i \geq 0\}}$ is not regular. CO2 7 Marks

b) Convert the following NFA-ε to NFA without Null move. CO2 7 Marks



UNIT-III

5	a)	Define context-free grammar. Explain with example.	CO3	7 Marks
	b)	Remove unit production from the following.	CO3	7 Marks
		$S \rightarrow XY,\ X \rightarrow a,\ Y \rightarrow Z \mid b,\ Z \rightarrow M,\ M \rightarrow N,\ N \rightarrow a$		
		(OR)		
6	a)	Find out whether the language $\mathbf{L = \{x^n y^n z^n \mid n \geq 1\}}$ is context free or not. Using Pumping lemma theorem.	CO3	7 Marks
	b)	Convert the following CFG into CNF	CO3	7 Marks
		$S \rightarrow XY \mid Xn \mid p \quad X \rightarrow mX \mid m \quad Y \rightarrow Xn \mid o$		

UNIT-IV

7	a)	Explain the basic structure of PDA.	CO4	7 Marks
	b)	Construct a PDA that accepts $\mathbf{L = \{0^n\ 1^n \mid n \geq 0\}}$	CO4	7 Marks
		(OR)		
8	a)	Write an algorithm to find PDA corresponding to a given CFG.	CO4	7 Marks
	b)	Design a top-down parser for the expression **"x+y*z"** for the grammar G with the following production rules.	CO4	7 Marks
		P: $S \rightarrow S+X \mid X,\ X \rightarrow X*Y \mid Y,\ Y \rightarrow (S) \mid id$		

UNIT-V

9	a)	Explain the model of Turing Machine (TM).	CO5	7 Marks
	b)	Design a TM to recognize all strings consisting of an odd number of α's.	CO5	7 Marks
		(OR)		
10	a)	Explain the concept of Multi-tape Turing Machines.	CO5	7 Marks
	b)	Explain Semi-Infinite Tape Turing Machine with neat sketch.	CO5	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

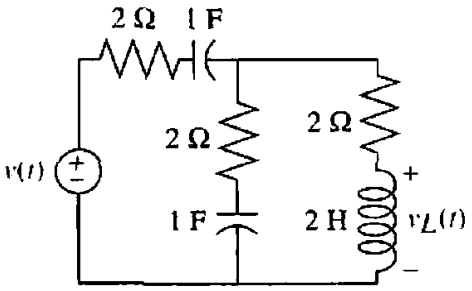
CONTROL SYSTEMS
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

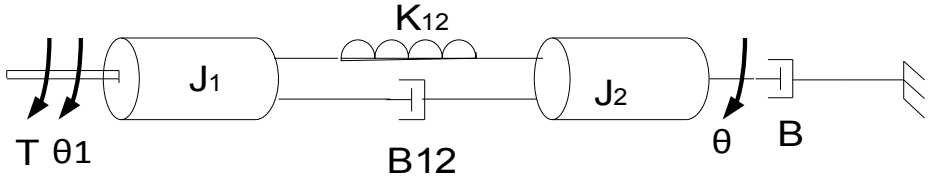
UNIT-I

1	a)	Discuss the effect of feedback on Gain, Stability, Sensitivity and Noise.	CO1	7 Marks
	b)	Derive the transfer function of following electrical network. Take input as $V(t)$ and output is current through the inductor.	CO4	7 Marks



(OR)

2		For the mechanical system, draw the electrical analogous circuits based on Torque-Voltage and Torque-Current analogy along their equations.	CO4	14 Marks



UNIT-II

3		The transfer function of a unity feedback system $G(S)H(S) = \frac{k}{s(s+2)(s+4)}$. Sketch the root locus and determine: i) The value of k to have 40 % overshoot for unit step input. ii) Value of K_V corresponding to value of K as obtained in (i). iii) Value of settling time t_s.	CO2	14 Marks

(OR)

4		Determine the resonant frequency W_r, resonant peak M_r, time to reach first overshoot, settling time and band width for the system whose transfer function is given by $\frac{C(s)}{R(s)} = \frac{5}{S^2+2S+5}$.	CO4	14 Marks

UNIT-III

5		A unity feedback system has an open loop transfer function $G(S) = \frac{60}{(S+1)(S+2)(S+5)}$. Sketch Nyquist plot for the system and determine whether the closed loop system is stable or not.	CO5	14 Marks

(OR)

6		Sketch the bode plot for system $G(S)H(S) = \frac{5(1+2S)}{(1+4S)(1+0.25S)}$ and comment on its stability.	CO5	14 Marks

UNIT-IV

7	a)	What are the types of controllers? Mention the effect of P, PID on controllers.	CO1	7 Marks
	b)	Explain the effect of the P controller on time response characteristics.	CO1	7 Marks

(OR)

8		A unity feed back system has an open-loop transfer function of $G(S) = \frac{4}{S(2S+1)}$. It is desired to obtain a phase margin of 40^0 without sacrificing the K_V of the system. Design a suitable lag-network and compute the value of network components assuming any suitable impedance level.	CO3	14 Marks

UNIT-V

9	a)	Explain the concept of controllability and observability.	CO1	7 Marks
	b)	The transfer function of a control system is given by $\frac{Y(s)}{U(s)} = \frac{S+2}{S^3+9S^2+26S+24}$. Check for controllability and observability.	CO2	7 Marks

(OR)

10		A system is characterized by the following state space equations.	CO4	14 Marks

$$\begin{bmatrix} \dot{X}_1 \\ \dot{X}_2 \end{bmatrix} = \begin{bmatrix} -3 & 1 \\ -2 & 0 \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u; t > 0$$

$$y = \begin{bmatrix} 1 & 0 \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \end{bmatrix}$$

i) Find the transfer function of the system.
ii) Compute the state transition matrix.
iii) Solve the state equation for the unit step input under zero initial conditions.

CODE No.: 16BT30401 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

ELECTRONIC CIRCUIT ANALYSIS AND DESIGN

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Apply cascoding concept to get large voltage gain.	CO6	7 Marks
	b)	Draw the single stage CE amplifier with an Emitter Resistance and explain the function of each component in it.	CO1	7 Marks
		(OR)		
2	a)	Apply cascading technique to construct a Direct coupled amplifier.	CO6	7 Marks
	b)	Derive expressions for Current gain, Voltage gain and Input Resistance and Output Resistance of Darlington amplifier.	CO3	7 Marks

UNIT-II

3	a)	Derive the expressions of Gain Bandwidth product for voltage and current.	CO3	7 Marks
	b)	A Transistor in CE configuration has the following parameters h_{fe}=210 and h_{ie}=4kΩ at I_c =2mA, with f_T =70MHz and $C_{b'c}$ =10pF. Determine r_{bb}', g_m, $r_{b'e}$, and $C_{b'e}$ at room temperature.	CO4	7 Marks
		(OR)		
4	a)	Prove that: i) $\mathbf{h_{ie}=r_{bb'}+r_{b'e}}$ ii) $\mathbf{g_{ce}= h_{oe}- g_m h_{re}}$	CO3	7 Marks
	b)	Write short notes on Frequency effects in Multistage Amplifiers.	CO1	7 Marks

UNIT-III

5	a)	Apply Voltage series feedback concept in a Emitter follower.	CO6	7 Marks
	b)	Select a RC phase shift Oscillator to get low frequency sign wave and derive the expression for the frequency of oscillations.	CO5	7 Marks
		(OR)		
6	a)	A Crystal oscillator has the following parameters. C**s** = 0**.**045pF, L=0**.**30H, C**p** = 2**.**0pF and R = 6**.**5KΩ. Find the series resonant frequency and Q - factor of the crystal.	CO4	7 Marks
	b)	Select a two Stage CE amplifier circuit and explain current-shunt feedback concept.	CO5	7 Marks

UNIT-IV

7	a)	Calculate the Output power and efficiency for a single ended class A power amplifier is coupled to an 10Ω load, using a transformer with a turn ratio of 8**:**2 with a 40V supply the transistor is biased to have a quiescent collector current of 200mA for a sinusoidal signal applied to the base, the collector voltage varies between a maximum of 5V and maximum of 80V.	CO4	7 Marks
	b)	Compare in between power amplifiers and small signal voltage amplifiers.	CO2	7 Marks
		(OR)		
8	a)	Derive an expression for maximum efficiency for Class - B complementary symmetry power amplifier	CO2	7 Marks
	b)	A class - B push pull power amplifier drives a load of 10Ω connected to the secondary of an ideal transformer. If the number of turns on the primary is 100 and that on the secondary is 20, calculate the maximum power output, dc power input, efficiency and maximum power dissipated per transistor if the supply voltage is 25Volts.	CO4	7 Marks

UNIT-V

9	a)	Obtain the expression for expression for Gain and Bandwidth in terms of effective Q – factor for capacitive coupled single tuned amplifier.	CO2	6 Marks
	b)	What are tuned amplifiers? How it is classified? Explain its operation.	CO1	8 Marks
		(OR)		
10	a)	Explain the class - C tuned amplifier and derive its efficiency equation.	CO1	7 Marks
	b)	Compare in between double tuned and single tuned amplifiers.	CO2	7 Marks

CODE No.: 16BT30402 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC16) Supplementary Examinations January – 2022

SIGNALS AND SYSTEMS
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Bring out the relation between: i) Signum and step function. ii) Sinusoidal and exponential functions based on their properties.	CO2	8 Marks
	b)	Express the Impulse function in terms of sampling function and explain its significance	CO4	6 Marks
		(OR)		
2	a)	List out the properties of an LTI system.	CO2	6 Marks
	b)	Evaluate the following integrals $\int_0^5 \delta(t)\sin(2\pi t)dt$ *and* $\int_{-\alpha}^{\alpha} e^{-\alpha t^2}\delta(t-10)dt$	CO4	8 Marks

UNIT-II

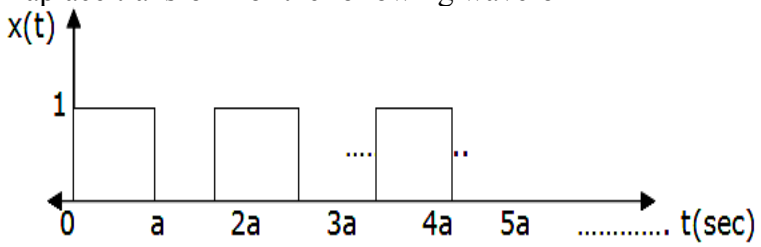
3	a)	What is the relationship between cosine and trigonometric representation of Fourier series?	CO1	6 Marks
	b)	Consider full rectified sine wave with peak amplitude ‘’ and time period is ‘’; expand this function in terms of exponential Fourier series. Also sketch the spectrum.	CO3	8 Marks
		(OR)		
4	a)	State and prove: i) Parseval’s relation. ii) Auto correlation property.	CO1	4 Marks
	b)	Consider a stable LTI System characterized by the differential equation $x(t) = \frac{dy(t)}{dt} + 2y(t)$. Find its impulse response.	CO2	10 Marks

UNIT-III

5	a)	A filter has an input $\mathbf{x(t)=e^{-2t}u(t)}$ and transfer fun ction, H(W)=1/(1+jw). Find ESD of the output.	CO1	8 Marks
	b)	The auto correlations function of an a periodic signal is: $R(t) = e^{\frac{-t^2}{2\sigma}}$ determine the PSD.	CO3	6 Marks
		(OR)		
6	a)	Examine how convolution and correlation of a signal are related in the context of signal processing.	CO3	7 Marks
	b)	Find the power, rms value and sketch the PSD for the following signal. x(t) = (A+sin 100t) cos200t.	CO1	7 Marks

UNIT-IV

7	a)	Obtain the Laplace Transform of a gate function and define ROC and with their conditions.	CO4	8 Marks
	b)	State and prove time-differentiation property and time integration property of one-sided Laplace transform	CO1	6 Marks
		(OR)		

8	a)	Find the Laplace transform of the following waveform 	CO4	9 Marks
	b)	State and explain ROC Property of Laplace Transform if x(t) is two sided signal.	CO1	5 Marks

UNIT-V

9	a)	A signal g(t) = Cos(200πt) + 2Cos(280πt) is sampled at a sampling frequency of 300 Hz. If the sampled signal is transmitted through an ideal LPF with cut-off frequency of 250 Hz, what frequency component will present in the output?	CO5	10 Marks
	b)	Mention and compare different types of sampling techniques with neat waveforms.	CO2	4 Marks

(OR)

10	a)	Prove that the final value of x[n] for $X(z) = \frac{z^2}{(z-1)(z-0.2)}$ is 1.25 and its initial value is unity.	CO5	8 Marks
	b)	Obtain the relationship among the Fourier Transform, Laplace Transform and Z-Transform.	CO2	6 Marks

CODE No.: 16BT30403 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC16) Supplementary Examinations January - 2022

SWITCHING THEORY AND LOGIC DESIGN

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Draw the logic diagram using AOI Logic to realize the following expressions i) $A \oplus B \oplus C$ ii) $A \odot B \odot C$	CO3	7 Marks
	b)	Assume that the even parity hamming code is $(0100111)_2$ is transmitted and that $(0100011)_2$ is received explain the process of identifying the error.	CO2	7 Marks
		(OR)		
2	a)	Minimize the following boolean expression to a minimum number of literals. i) (x'y'+z)'+z+xy+wz to three literals. ii) (A'+C)(A'+C')(A'+B+C'D).	CO3	7 Marks
	b)	Find the complement and the dual of the function given below $F=[(xy)'x][(xy)'y]$	CO5	7 Marks

UNIT-II

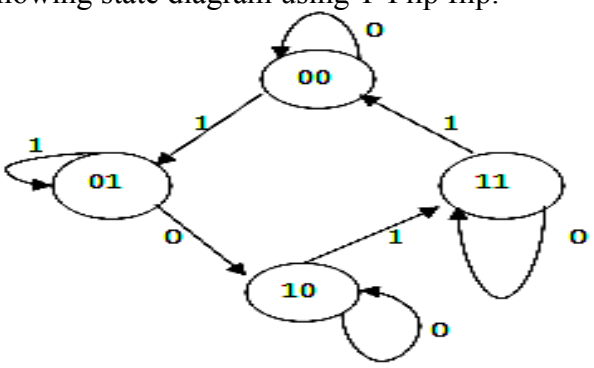
3	a)	Simplify the following function using K-map method. F (A, B, C, D) = Σm(0,1,2,3,4,10,11,12)+d (0, 3, 6, 10).	CO5	7 Marks
	b)	Minimize the following expression using K-map and realize using NAND gates. F = Σm(1, 2, 3, 8, 9, 10, 11, 15)	CO3	7 Marks
		(OR)		
4	a)	Simplify the following function using Tabular Method. F (X, Y, Z, W) = Σm(0,1,2,3,4,11,12).	CO5	7 Marks
	b)	Minimize the following expression using K-Map Y(w,x,y,z)=∑m(1,2,3,5,9,12)	CO3	7 Marks

UNIT-III

5	a)	Construct a 16 x 1 Mux by using 4 x 1 Mux.	CO6	7 Marks
	b)	Realize the function "F" using MUX F(P,Q,R,S)= ∑m (0,1,3,4,8,9,15).	CO3	7 Marks
		(OR)		
6	a)	Draw the BCD to seven segment display decoders.	CO6	8 Marks
	b)	Design a 16-line to 1-line multiplexer using 2-line to 1-line multiplexer.	CO3	6 Marks

UNIT-IV

7	a)	Explain the working of Master/Slave JK FF.	CO1	7 Marks
	b)	Reduce the following state diagram using T-Flip flip.	CO5	7 Marks



(OR)

8	a)	Differentiate between Asynchronous and Synchronous Counter.	CO1	7 Marks
	b)	Show that, how ring counter will act as a johnson counter.	CO4	7 Marks

UNIT-V

9	a)	Reduce the following sequential circuit using D-flip-flop for the following state table1:	CO2	7 Marks

Table:1

Present state	Next state		Output(Z)	
	X=1	X=0	X=1	X=0
Q_1	Q_2	Q_1	0	0
Q_2	Q_3	Q_1	0	0
Q_3	Q_4	Q_5	0	0
Q_4	Q_4	Q_1	0	0
Q_5	Q_2	Q_1	1	0

	b)	Apply 2-bit binary input to PROM and generate square of the binary input.	CO4	7 Marks

(OR)

10	a)	Reduce the following sequential circuit using T-flip-flop considering the following table	CO2	7 Marks

Table.3

Present State		**Next State**		**output**	
		X=0	**X=1**	**X=0**	**X=1**
A	B	AB	AB	Y	Y
0	0	00	10	0	0
0	1	11	00	0	0
1	0	10	01	1	1
1	1	00	10	1	0

	b)	Obtain capabilities and limitations of finite state machines with aid of neat sketches.	CO4	7 Marks

CODE No.: 16BT40104 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC16) Supplementary Examinations January – 2022

STRUCTURAL ANALYSIS-I
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

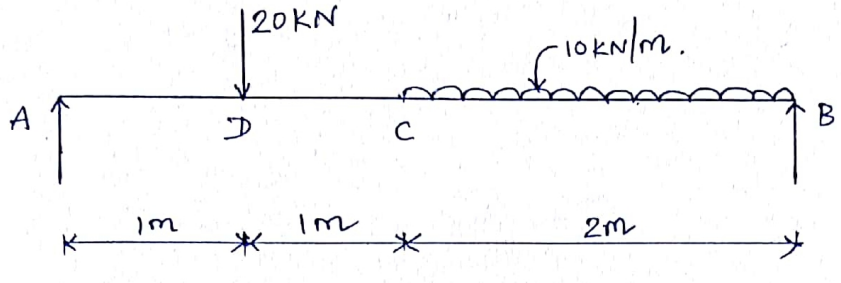
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Derive the expression for the stresses acting in an inclined plane due to the forces acting in only one direction.	CO1	6 Marks
	b)	At a point in a strained material the normal stresses on two planes at right angles are 80N/mm² and 60N/mm² and both are tensile. Find the resultant intensity of stress on a plane inclined at 45° to the axis of maximum stress.	CO2	8 Marks
		(OR)		
2	a)	At a point in a strained material the normal stresses on two planes at right angles are 100N/mm² and 50N/mm² and both are compressive. Find the resultant intensity of stress on a plane inclined at 60° to the axis of maximum stress.	CO2	4 Marks
	b)	At a point in a strained material the resultant intensity of stress across a plane is 56.56N/mm² in tensile inclined at 45° to its normal. The normal component of the intensity across planes at right angles is 20N/mm² compressive. Find the position of principal planes and stresses across them. Also determine the value of maximum shear at that point.	CO2	10 Marks

UNIT-II

3	a)	Derive the relation between slope, deflection and radius of curvature.	CO1	8 Marks
	b)	A cantilever beam 1.5m long having cross sectional dimensions as 100mm x 150mm carries a uniformly distributed load of 5kN/m throughout. Determine the slope and deflection at the free end.	CO2	6 Marks
		(OR)		
4		A beam AB of span 4 meters is simply supported at the ends and is loaded as shown in the figure. Determine: i) Deflection at C. ii) Maximum Deflection. iii) Slope at end A. Take E= 200 x 10^6 kN/m² and I= 20 x 10^{-6} m⁴.	CO4	14 Marks



UNIT-III

5		List out the assumptions made in Euler's theory. Derive the Euler's formula when both ends of the column are hinged.	CO1	14 Marks
		(OR)		

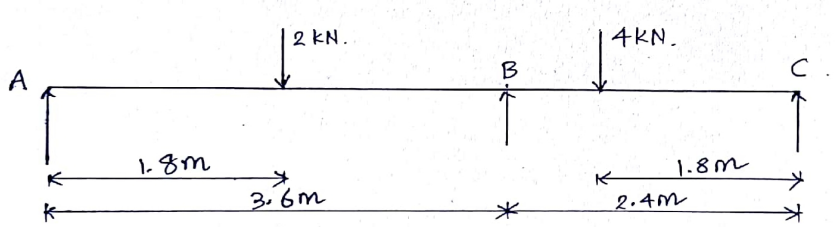
6		Compare the crippling loads given by Rankine's and Euler's formulae for tubular strut 2.25 m long having outer and inner diameters of 37.5 mm and 32.5 mm loaded through pin-joint at both ends. Take yield stress as 315 MN/m^2; a = 1/7500; and E = 200 GN/m^2. If elastic limit for the material is taken as 200 MN/m^2, then for what length of the strut does the Euler formula cease to apply?	CO5	14 Marks

UNIT-IV

7		Analyze a fixed beam AB of span 'l' carrying a point load W at the mid-span. Draw the shear force and bending moment diagrams.	CO2	14 Marks

(OR)

8		Draw the bending moment and shear force diagrams of a beam shown in the figure which is simply supported at the supports A and C and is continuous over the support B. Assume EI is constant.	CO6	14 Marks



UNIT-V

9	a)	Explain in detail about Maximum Shear Stress theory.	CO1	7 Marks
	b)	In a metallic body the principal stresses are +35 MN/m^2 and -95 MN/m^2, the third principal stress being zero. The elastic limit stress in simple tension as well as in simple compression is equal and is 220 MN/m^2. Find the factor of safety based on the elastic limit, if the criterion of the failure for the material is the maximum principal stress theory.	CO5	7 Marks

(OR)

10		A cantilever of a rectangular section 40 mm wide and 60mm deep is subjected to an inclined load P at the free end. The inclination of the load is 25° to the vertical. If the length of the cantilevers is 2m and the maximum stress due to bending is not to exceed 200 MN/m^2, determine the value of P.	CO3	14 Marks

❀ ❀ ❀

CODE No.: 16BT40201 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

ELECTRICAL MEASUREMENTS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define measurement and explain the classification of measuring instruments.	CO1	6 Marks
	b)	Describe the various operating forces required for proper operation of analog indicating instruments and write its importance.	CO1	8 Marks
		(OR)		
2	a)	Three Resistors have the following ratings: R_1=37±5%, R_2=75±3%, R_3=50±5%. Determine the magnitude and limiting error in Ohm and percentage error of the resistance when three resistors are connected in series.	CO4	7 Marks
	b)	Design a universal or ayrton shunt to provide an ammeter with current range of 1A, 5A and 10A. A basic meter with an internal resistance of 50Ω and full scale deflection current of 1mA is to be used.	CO3	7 Marks

UNIT-II

3		Describe the constructional details of the Electrodynamometer type wattmeter with a neat sketch and also derive the torque equation.	CO2	14 Marks
		(OR)		
4	a)	Explain the sources of errors and compensation in single phase induction type energy meter.	CO1	7 Marks
	b)	A 230 V, single phase, watt hour meter has a constant load of 4 A passing through it for 6 hours at unity power factor. If the meter disc makes 2208 revolutions during this period. Determine: i) The meter constant in revolutions per kWh. ii) Evaluate the power factor of the load if the number of revolutions made by the meter are 1472 when operating at 230V and 5 A for 4 hours.	CO4	7 Marks

UNIT-III

5		Draw the equivalent circuit and phasor diagram of a current transformer and derive the expressions for ratio and phase angle errors.	CO2	14 Marks
		(OR)		
6	a)	Describe in detail about the construction and working principle of single phase EDM type power factor meter.	CO1	9 Marks
	b)	A 1000/5A, 50Hz current transformer has secondary burden of 1.5Ω (non-inductive). Calculate the flux in the core and the ratio error at rated condition of the current transformer. Assume iron loss in the core to be 1.5 Watts. Neglect leakage flux and magnetizing current.	CO4	5 Marks

UNIT-IV

7	a)	Describe the method of measurement of medium resistance using wheatsone bridge.	CO1	7 Marks
	b)	The four arms of a Wheatstone bridge are as follows. AB = 100Ω; BC = 1000Ω; CD = 4000 Ω; DA = 400 Ω. The galvanometer has a resistance of 100 Ω, and sensitivity of 100mm/μA and it is connected across AC. A source of 4V D.C is connected across BD. Calculate the current through the galvanometer and its deflection if the resistance of arm DA is changed from 400Ω to 401Ω.	CO4	7 Marks

(OR)

8	a)	Derive the expression for unknown induction by balancing Maxwell inductance bridge and draw the phasor diagram, advantages and disadvantages of the bridge.	CO2	8 Marks
	b)	An Owen's bridge is used to measure the properties of a sample of sheet steel at 2 kHz. At balance, arm *AB* is test specimen; arm *BC* is R_3=100Ω; arm *CD* is C_4 = 0.1μF and arm *DA* is R_2 = 834Ω in series with C = 0.124 μF. Determine the effective impedance of the specimen under test conditions.	CO6	6 Marks

UNIT-V

9	a)	Explain the term "Standardization" of a potentiometer. Describe the procedure for Standardization of a D.C potentiometer.	CO1	7 Marks
	b)	A basic slide wire potentiometer has a working battery voltage of 3.0 V with negligible internal resistance. The resistance of slide wire is 400 Ω and its length is 200 cm. A 200 cm scale is placed along the slide wire. The slide wire has 1 mm scale divisions and it is possible to read up to 1/5 of a division. The instrument is standardized with 1.018 V standard cell with sliding contact at the 101.8 cm mark on scale. Compute: i) working current. ii) the resistance of series rheostat. iii) the measurement range. iv) the resolution of instrument.	CO4	7 Marks

(OR)

10	a)	Describe in detail about the function of different parts of CRT with neat sketch.	CO1	7 Marks
	b)	Describe in detail about the ramp type digital voltmeters with neat sketch.	CO1	7 Marks

❀ ❀ ❀

CODE No.: 16BT40202 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

GENERATION OF ELECTRIC POWER
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Write the advantages and disadvantages of steam power plant over other plants.	CO2	7 Marks
	b)	Classify different types of turbines used in thermal power stations.	CO1	7 Marks
		(OR)		
2	a)	List some factors which should be considered for site selection of hydro plants.	CO5	6 Marks
	b)	Classify different types of hydro electric power stations.	CO1	8 Marks

UNIT-II

3	a)	Discuss some environmental regulations to be followed for erecting nuclear power generating plants.	CO8	6 Marks
	b)	Explain the energy cycle for a simple-cycle gas turbine with the help of neat diagram.	CO1	8 Marks
		(OR)		
4	a)	Explain the process of chain reaction due to fission and fusion.	CO1	9 Marks
	b)	Briefly discuss with a neat diagram about: i) fuel. ii) moderator. iii) reflector. iv) control rods. v) shield in nuclear power plant.	CO1	5 Marks

UNIT-III

5	a)	Enlist the applications of renewable energy sources.	CO1	6 Marks
	b)	Define the following. i) solar cell. ii) PV module. iii) PV array. iv) short circuit current. v) open circuit voltage. vi) fin factor. vii) solar cell efficiency. viii) peak watt.	CO1	8 Marks
		(OR)		
6	a)	Describe the principle of fuel cells. Discuss the choice of fuel cells required with relative advantages and disadvantages.	CO6	7 Marks
	b)	What are the different types of wind mills used in wind turbine power plants? Discuss the impact of wind power plants on environment.	CO7	7 Marks

UNIT-IV

7	a)	Deduce the relation between load factor and loss factor for the following cases. i) Off peak load is zero. ii) Existing of very short peak value. iii) Load is steady.	CO2	8 Marks
	b)	A distribution transformer costs Rs 2,00,000 and has a useful life of 20 years. If the salvage value is Rs 10,000 and rate of annual compound interest is 8%, then calculate the amount to be saved annually for replacement of the transformer at the end of 20 years by sinking fund method.	CO4	6 Marks
		(OR)		

8	a)	What is the significance of depreciation in the economics of power generation?	CO1	6 Marks
	b)	Explain: i) two part tariff. ii) three part tariff. iii) power factor tariff.	CO1	8 Marks

UNIT-V

9	a)	Define power factor and explain its importance and discuss its disadvantages of low power factor.	CO1	7 Marks
	b)	Show that the economical limit to which the power factor of a load can be raised is independent of the original value of power factor when the tariff consists of a fixed charge per kVA of maximum demand plus a flat rate per kWh.	CO2	7 Marks

(OR)

10	a)	Write short notes on the following : i) Design of capacitor bank for power factor improvement. ii) Importance of p.f. improvement. iii) Economics of p.f. improvement.	CO3	7 Marks
	b)	Explain the principle of cogeneration and mention how the cogeneration can be implemented for generating electricity.	CO1	7 Marks

CODE No.: 16BT40203 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC16) Supplementary Examinations January - 2022

TRANSFORMERS AND INDUCTION MACHINES

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	"Voltage regulation of a transformer varies with power factor". Justify the statement.	CO2	6 Marks
	b)	A 20 kVA 2500/500V single phase transformer has winding impedance of 8+j17 Ω and 0.3+j0.7 Ω on HV side and LV side respectively. Find the voltage regulation and secondary terminal voltage at full load for a p.f. of (i) 0.8 lagging and (ii) 0.8 leading	CO4	8 Marks
		(OR)		
2	a)	Derive an expression for computing the per unit voltage regulation of a transformer both for lagging and leading power factors.	CO1	6 Marks
	b)	A 3300/230V single phase transformer has an equivalent resistance of 0.015 p.u. and an equivalent reactance of 0.04 p.u. Find the secondary terminal voltage at full load and 0.8 p.f. lag, for a voltage of 3300V.	CO4	8 Marks

UNIT-II

3	a)	State the essential and desirable conditions which should be satisfied for parallel operation of two single phase transformers.	CO1	6 Marks
	b)	Two single-phase transformers in parallel supply a load of 500 amperes at 0.8 p.f. lagging and at 400 volts. Their equivalent impedances referred to secondary windings are (2+j3) ohms and (2.5+j5) ohms. Compute the current and kVA supplied by each transformer and the corresponding power factors.	CO4	8 Marks
		(OR)		
4	a)	Prove that in an auto-transformer, the power transfer from primary circuit to the secondary circuit is partly by induction and partly by conduction.	CO2	6 Marks
	b)	A 11000/2200 V, 100 kVA, 1-phase two-winding transformer is to be used as an auto-transformer by connecting the two windings in series. Obtain the possible values of voltage ratios and kVA outputs.	CO4	8 Marks

UNIT-III

5		Give the equivalent circuit and applications of 3-winding transformer. Explain how the parameters can be determined experimentally.	CO1	14 Marks
		(OR)		
6		Why the tap changing transformers are required? Also discuss the function and principle of operation of no-load and on-load tap changing transformers with neat diagrams.	CO1	14 Marks

UNIT-IV

7	a)	Explain how the rotating magnetic field is produced in a 3-phase induction motor.	CO1	7 Marks
	b)	A 3-phase induction motor is wound for 4-poles and is supplied from 50Hz system. Calculate the synchronous speed, the rotor speed when slip is 4% and rotor frequency when motor runs at 600 r.p.m.	CO4	7 Marks
		(OR)		

8	a)	Compare a single-cage induction motor with a double-cage inductor motor of same rating.	CO1	6 Marks
	b)	Derive the relationship between the torques developed by outer and inner cages of a double-cage induction motor.	CO2	8 Marks

UNIT-V

9	a)	Explain the speed control method of 3-phase induction motor by varying the supply frequency.	CO5	7 Marks
	b)	A 50 Hz, 440 V, 3-phase, 4-pole induction motor develops half the rated torque at 1490 r.p.m. With the applied voltage remaining at rated value, what would be its frequency, if the motor has to develop the same torque at 1600 r.p.m? Neglect stator and rotor winding resistances and leakage reactances and iron losses.	CO4	7 Marks

(OR)

10	a)	A 3-phase induction motor is used in railway traction application. It is used for motoring, braking and generating. With the help of torque-slip characteristics explain the above said modes of operation of a 3-phase induction motor	CO6	8 Marks
	b)	Find the ratio of starting current to full load current for a 10kW, 400V, 3-phase induction motor with a star - delta starter if the full load efficiency is 0.86, the full load power factor is 0.8 and short circuit current is 30A at 100V.	CO2	6 Marks

CODE No.: 16BT40301 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

DESIGN OF MACHINE ELEMENTS - I
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Enumerate the various manufacturing methods of machine parts which a designer should know.	CO1	7 Marks
	b)	What are the factors to be considered for the selection of materials for the design of machine elements?	CO1	7 Marks
		(OR)		
2		The following results were obtained in a tensile test on a mild steel specimen of original diameter 20 mm and gauge length 40 mm. Load at limit of proportionality = 80 kN Extension at 80 kN load = 0.048 mm Load at yield point = 85 kN Maximum load = 150 kN When the two parts were fitted together after being broken, the length between gauge lengths was found to be 55.6 mm and the diameter at the neck was 15.8 mm. Calculate Young's modulus, yield stress, ultimate tensile stress, percentage elongation and percentage reduction in area.	CO3	14 Marks

UNIT-II

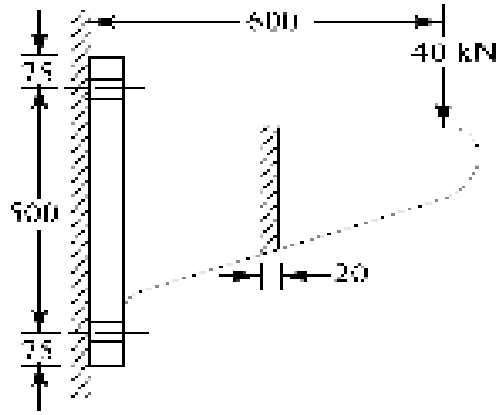
3	a)	What is meant by endurance strength of a material? How do the size and surface condition of a component and type of load and affect such strength?	CO1	4 Marks
	b)	A circular bar of 500mm length is supported freely at its two ends. It is acted upon by a central concentrated cyclic load having a minimum value of 20kN and maximum value of 50kN. Determine the dia. of bar by taking a factor of safety of 1.5, size effect of 0.85, surface finish factor of 0.9. The material properties of bar are given by ultimate strength of 650 MPa, yield strength of 500 MPa and endurance strength of 350 MPa.	CO5	10 Marks
		(OR)		
4	a)	Formulate Goodman's equation and state its application to different types of loading.	CO2	6 Marks
	b)	A 50mm diameter shaft is made from carbon steel having ultimate tensile strength of 630 MPa. It is subjected to a torque which fluctuates between 2000 N-m to 800 N-m. Using Soderberg method, calculate the factor of safety. Assume suitable values for any other data needed.	CO4	8 Marks

UNIT-III

5	a)	Discuss on bolts of uniform strength giving examples of practical applications of such bolts.	CO1	7 Marks
	b)	A plate 100 mm wide and 12.5 mm thick is to be welded to another plate by means of parallel fillet welds. The plates are subjected to a load of 50 kN. Find the length of the weld so that the maximum stress does not exceed 56 MPa. Consider the joint first under static loading and then under fatigue loading.	CO4	7 Marks

(OR)

6 A wall bracket, as shown in figure is fixed to a wall by means of four bolts. CO4 14 Marks



All dimensions in mm.

Find the size of the bolts and the width of bracket. The safe stress in tension for the bolt and bracket may be assumed as 70 MPa.

UNIT-IV

7 a) A steel spindle transmits 4 kW at 800 r.p.m. The angular deflection should not exceed 0.25° per metre of the spindle. If the modulus of rigidity for the material of the spindle is 84 GPa, find the diameter of the spindle and the shear stress induced in the spindle. CO3 7 Marks

b) A solid shaft is transmitting 1 MW at 240 r.p.m. Determine the diameter of the shaft if the maximum torque transmitted exceeds the mean torque by 20%. Take the maximum allowable shear stress as 60 MPa. CO3 7 Marks

(OR)

8 Design and draw a protective type of cast iron flange coupling for a steel shaft transmitting 15 kW at 200 r.p.m and having an allowable shear stress of 40 MPa. The working stress in the bolts should not exceed 30 MPa. Assume that the same material is used for shaft and key and that the crushing stress is twice the value of its shear stress. The maximum torque is 25% greater than the full load torque. The shear stress for cast iron is 14 MPa. CO4 14 Marks

UNIT-V

9 Design a sleeve and cotter joint to resist a tensile load of 50 kN. All parts of the joint are made of the same material with the following allowable stresses: σ_t =50 MPa; ζ =70 MPa ; and σ_c=125 MPa. CO6 14 Marks

(OR)

10 Design a cotter joint to connect piston rod to the crosshead of a double acting steam engine. The diameter of the cylinder is 300 mm and the steam pressure is 1 N/mm^2. The allowable stresses for the material of cotter and piston rod are as follows:
σ_t=50 MPa; ζ=40 MPa; and σ_c=84 MPa CO4 14 Marks

CODE No.: 16BT40302 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC16) Supplementary Examinations January – 2022

DYNAMICS OF MACHINERY
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		A centrifugal clutch is to transmit 15 kW at 900 r.p.m. The shoes are four in number. The speed at which the engagement begins is $3/4^{th}$ of the running speed. The inside radius of the pulley rim is 150 mm and the centre of gravity of the shoe lies at 120 mm from the centre of the spider. The shoes are lined with Ferrodo for which the coefficient of friction may be taken as 0.25. Determine : i) Mass of the shoes. ii) Size of the shoes, if angle subtended by the shoes at the centre of the spider is 60^{o} and the pressure exerted on the shoes is $0.1N/mm^{2}$.	CO2	14 Marks

(OR)

2	a)	Classify Dynamometers and explain any one Dynamometer with a neat sketch.	CO1	6 Marks
	b)	In a band and block brake, the band is lined with 14 blocks, each of which subtends an angle of 20° at the drum centre. One end of the band is attached to the fulcrum of the brake lever and the other to a pin 150 mm from the fulcrum. Find the force required at the end of the lever 1 metre long from the fulcrum to give a torque of 4 kN-m. The diameter of the brake drum is 1 metre and the coefficient of friction between the blocks and the drum is 0.25.	CO2	8 Marks

UNIT-II

3	a)	What do you understand by gyroscopic couple? Derive a formula for its magnitude.	CO1	7 Marks
	b)	An aeroplane makes a complete half circle of 50 metres radius, towards left, when flying at 200 km per hr. The rotary engine and the propeller of the plane has a mass of 400 kg and a radius of gyration of 0.3 m. The engine rotates at 2400 r.p.m. clockwise when viewed from the rear. Find the gyroscopic couple on the aircraft and state its effect on it.	CO3	7 Marks

(OR)

4	a)	Define Coefficient of Fluctuation of Energy and Coefficient of Fluctuation of Speed	CO1	4 Marks
	b)	The flywheel of a steam engine has a radius of gyration of 1 m and mass 2500 kg. The starting torque of the steam engine is 1500 N-m and may be assumed constant. Determine: i) the angular acceleration of the flywheel. ii) the kinetic energy of the flywheel after 10 seconds from the start. Discuss in detail various attribute charts.	CO3	10 Marks

UNIT-III

5	a)	Explain the terms and derive expressions for 'effort' and 'power' of a Porter governor.	CO1	7 Marks
	b)	A loaded Porter governor has four links each 250 mm long, two revolving masses each of 3 kg and a central dead weight of mass 20 kg. All the links are attached to respective sleeves at radial distances of 40 mm from the axis of rotation. The masses revolve at a radius of 150 mm at minimum speed and at a radius of 200 mm at maximum speed. Determine the range of speed.	CO2	7 Marks

(OR)

6		In a Hartnell governor, the lengths of ball and sleeve arms of a bell crank lever are 120 mm and 100 mm respectively. The distance of the fulcrum of the bell crank lever from the governor axis is 140 mm. Each governor ball has a mass of 4 kg. The governor runs at a mean speed of 300 r.p.m. with the ball arms vertical and sleeve arms horizontal. For an increase of speed of 4 per cent, the sleeve moves 10 mm upwards. Neglecting friction, find : i) the minimum equilibrium speed if the total sleeve movement is limited to 20 mm. ii) the spring stiffness. iii) the sensitiveness of the governor. iv) the spring stiffness if the governor is to be isochronous at 300 r.p.m.	CO2	14 Marks

UNIT-IV

7	a)	Explain clearly the terms 'static balancing' and 'dynamic balancing'. State the necessary conditions to achieve them.	CO1	7 Marks
	b)	Four masses m_1 , m_2 , m_3 and m_4 are 200 kg, 300 kg, 240 kg and 260 kg respectively. The corresponding radii of rotation are 0.2 m, 0.15 m, 0.25 m and 0.3 m respectively and the angles between successive masses are 45°, 75° and 135°. Find the position and magnitude of the balance mass required, if its radius of rotation is 0.2 m.	CO4	7 Marks

(OR)

8		The following data refer to two cylinder locomotive with cranks at 90°: Reciprocating mass per cylinder = 300 kg; Crank radius = 0.3 m; Driving wheel diameter = 1.8 m; Distance between cylinder centre lines = 0.65 m; Distance between the driving wheel central planes = 1.55 m. Determine : i) the fraction of the reciprocating masses to be balanced, if the hammer blow is not to exceed 46 kN at 96.5 km. p.h.; ii) the variation in tractive effort ; and the maximum swaying couple.	CO4	14 Marks

UNIT-V

9	a)	Explain the term 'Logarithmic decrement' as applied to damped vibrations.	CO1	6 Marks
	b)	The following data are given for a vibratory system with viscous damping: Mass = 2.5 kg ; spring constant = 3 N/mm and the amplitude decreases to 0.25 of the initial value after five consecutive cycles. Determine the damping coefficient of the damper in the system.	CO5	8 Marks

(OR)

10	a)	Describe the method of finding the natural frequency of torsional vibration for three rotar system.	CO1	6 Marks
	b)	A shaft of length 1.5 m is 0.095 in in diameter for the first 0.6 m of its length, 0.06 m in diameter for the next 0.5 m of the length and 0.05 m in diameter for the remaining 0.4 m of its length. The shaft carries two rotors at two ends. The mass moment of inertia of the first rotor is 650 kg m^2 where as of the second is 212 kgm^2. Determine the natural frequency of free torsional vibration of the system. The modulus of rigidity of shaft material may be taken as 80 GN/m^2.	CO5	8 Marks

CODE No.: 16BT40303 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, January 2022

FLUID MECHANICS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		An inverted U-tube manometer is connected to two horizontal pipes A and B through which water is flowing. The vertical distance between the axes of these pipes is 30 cm. When an oil of sp. gravity 0.8 is used as a gauge fluid, the vertical heights of the columns in the two limbs of the inverted manometer are found to be same and equal to 35 cm. Determine the difference of pressure between the pipes.	CO3	14 Marks
		(OR)		
2		Define the surface tension. Prove that the relation between surface tension and pressure inside the droplet of liquid in excess of outside pressure	CO1	14 Marks

UNIT-II

3		A 45º reducing bend is connected in a pipe line, the diameter at inlet and outlet of the bend being 600 mm and 300 mm respectively. Find the force exerted by the water on the bend if the intensity of the pressure at inlet to bend is 8.829 N/cm² and rate of flow of water is 600 litres/s.	CO5	14 Marks
		(OR)		
4		Explain the following fluid patterns. i) Path line ii) stream line iii) Streak line iv) stream tube.	CO1	14 Marks

UNIT-III

5	a)	Derive an expression for head loss through pipes due to friction.	CO5	7 Marks
	b)	An old water supply distribution pipe of 250 mm diameter of a city is to be replaced by two parallel pipes of smaller equal diameter having equal lengths and identical friction factor values. Find out the new diameter required.	CO6	7 Marks
		(OR)		
6		A jet of water diameter 7.5 cm strikes a curved plate at its centre with a velocity of 20 m/s. the curved plate is moving with a velocity of 8 m/s in the direction of the jet. The jet is deflected through an angle of 165º.assuming the plate smooth. Find: i) Force exerted on the plate in the direction of jet. ii) Power of the jet. iii) Efficiency of the jet.	CO4	14 Marks

UNIT-IV

7		Describe briefly the function of various main components of Francis turbine with neat sketches.	CO1	14 Marks
		(OR)		
8		What do you understand by the characteristic curves of a turbine? Explain the important types of characteristic curves.	CO1	14 Marks

UNIT-V

9	a)	Draw and discuss the operating characteristics of a centrifugal pump.	CO1	7 Marks
	b)	A centrifugal pump is to discharge 0.118 m^3/ sec at a speed of 1450 rpm against a head of 25m. The impeller diameter at outlet is 250 mm and its width at outlet is 50mm and manometric efficiency is 75%. Determine vane angle at outer periphery of the impeller.	CO2	7 Marks

(OR)

10	a)	Define air vessel. Describe the function of the air vessel for reciprocating pumps.	CO1	7 Marks
	b)	How will you classify the reciprocating pumps?	CO1	7 Marks

CODE No.: 16BT40304 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC16) Supplementary Examinations January – 2022

MACHINE TOOLS AND MODERN MACHINING PROCESSES
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Design a single point cutting tool and explain the nomenclature with a neat sketch.	CO3	7 Marks
	b)	Discuss the positive, negative and zero rake angles with the help of diagrams.	CO1	7 Marks
		(OR)		
2		Derive merchant circle theory for obtaining the relations between various forces and angles during turning operation with assumptions.	CO4	14 Marks
		UNIT-II		
3	a)	Explain the working principle of lathe with a neat diagram.	CO1	7 Marks
	b)	List the various tool holding device in lathe. Discuss in detail.	CO1	7 Marks
		(OR)		
4	a)	Analyze the similarities and differences of Capstan and Turret Lathe.	CO2	7 Marks
	b)	Classify Automatic Lathes in detail.	CO1	7 Marks
		UNIT-III		
5	a)	Explain the working principle and principal parts of Shaper with a neat diagram.	CO1	7 Marks
	b)	Distinguish between shaper and planer.	CO2	7 Marks
		(OR)		
6	a)	Design a twist drill and label the important features.	CO3	7 Marks
	b)	Write a short note on counter boring, counter sinking, trepanning operations in drilling.	CO1	7 Marks
		UNIT-IV		
7	a)	Explain the various surface Grinding processes with the help of a neat sketch.	CO1	7 Marks
	b)	Analyze the need for balancing of grinding wheels.	CO2	7 Marks
		(OR)		
8	a)	Give a brief classification of milling machines.	CO1	7 Marks
	b)	Define indexing. Explain about simple indexing.	CO1	7 Marks
		UNIT-V		
9	a)	Analyze the necessity to go for Modern machining processes.	CO4	7 Marks
	b)	Classify Modern machining processes.	CO5	7 Marks
		(OR)		
10	a)	Explain the principle involved in USM.	CO5	7 Marks
	b)	State the advantages of ultrasonic machining and its applications.	CO5	7 Marks

❀ ❀ ❀

CODE No.: 16BT40305 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC16) Supplementary Examinations January – 2022

THERMAL ENGINEERING-I
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define the terms and mention the units in which they are normally measured: i) Bore. ii) Stroke. iii) Displacement volume. iv) Compression ratio.	CO1	8 Marks
	b)	What is meant by TDC and BDC? Draw the suitable sketch and mark the two dead centres.	CO1	6 Marks

(OR)

2	a)	Explain the effect of disassociation on maximum temperature and brake power and brake power. How does the presence of CO affect dissociation?	CO2	8 Marks
	b)	Mention the various simplified assumptions used in fuel-air cycle analysis.	CO1	6 Marks

UNIT-II

3	a)	Compare the phenomenon of knock in SI engine with CI engine knock.	CO2	7 Marks
	b)	What are homogeneous and heterogeneous mixtures? In which engines these mixtures are used? Explain.	CO1	7 Marks

(OR)

4	a)	Explain the effect of various engine variables on SI engine knock.	CO2	7 Marks
	b)	List the various types of combustion chambers used in SI engines and explain in detail.	CO1	7 Marks

UNIT-III

5	a)	List the various methods used available for finding the frictional power of an engine and explain the method of finding the friction power by using motoring test.	CO1	7 Marks
	b)	A four - stroke, four cylinder gasoline engine has a bore of 60mm and a stroke of 100mm. On test it develops a torque of 66.5 Nm when running at 3000 r.p.m. If the Clearance volume in each cylinder is 60cc the relative efficiency with respect to brake Thermal efficiency is 0.5 and the calorific value of the fuel is 42MJ/kg, determine the fuel consumption in kg/h and the brake mean effective pressure.	CO4	7 Marks

(OR)

6	a)	Define the terms: i) Brake Thermal Efficiency. ii) Mechanical Efficiency. iii) Volumetric Efficiency. iv) Indicated Thermal Efficiency.	CO1	7 Marks
	b)	A four - stroke gas engine has a bore of 20cm and stroke of 30cm and runs at 300 r.p.m firing every cycle. If air-fuel ratio is 4:1 by volume and volumetric efficiency on NTP basis is 80%, determine the volume of gas used per minute. If the calorific value of gas is 8MJ/m^3 at NTP and the brake thermal efficiency is 25%, determine brake power of the engine.	CO3	7 Marks

UNIT-IV

7	a)	What is adiabatic flame temperature?	CO1	4 Marks
	b)	The analysis of the dry exhaust from an internal combustion engine is as follows: Carbon dioxide (CO_2) =15%, carbon monoxide (CO) = 3%, Methane (CH_4) = 3%, Hydrogen(H_2) = 1%, Oxygen (O_2) = 2% and Nitrogen (N_2) = 76%. Calculate the proportions by mass of carbon in hydrogen in the fuel, assuming it to be a pure hydrocarbon.	CO5	10 Marks

(OR)

8	a)	What is enthalpy of formation?	CO1	4 Marks
	b)	Orsat analysis of the products of combustion of a hydrocarbon fuel of known composition is as follows: Carbon dioxide (CO_2) =18%, carbon monoxide (CO) = 0.5%, Oxygen (O_2) = 6.3% and Nitrogen (N_2) = 85.2%. Determine the following: i) Air –fuel ratio. ii) Percentage of theoretical air required for combustion.	CO5	10 Marks

UNIT-V

9	a)	What are different types of rotary compressors and explain briefly the working of any two rotary compressors?	CO1	7 Marks
	b)	A compressor compresses air 100 kPa to 700 kPa. The clearance volume is 2.13 liters and compression and expansion are polytrophic with n=1.3 for each. If the volumetric efficiency of compressor be 85 %, determine the swept volume and the diameter of the cylinder. Assume a stroke length of 30 mm.	CO2	7 Marks

(OR)

10	a)	Explain the effect of inter cooling in a multi stage reciprocating compressor.	CO1	7 Marks
	b)	Estimate the minimum work required to compress 2 kg of air from 1 bar 330K to 18 bar in two stages if the law of compression is $PV^{1.25}$ = constant and inter cooling is perfect.	CO2	7 Marks

CODE No.: 16BT40401 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

ANALOG COMMUNICATIONS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Derive the time domain expression of VSB modulated wave s(t) containing a vestige of upper side band.	CO5	8 Marks
	b)	Find the percentage of power saved in SSB when compared with AM system.	CO1	6 Marks
		(OR)		
2	a)	With a neat block diagram, explain the working of FDM technique.	CO8	9 Marks
	b)	Discuss the appropriate amplitude modulation technique which requires modulated band width equal to the twice of message signal band width and more power consumption.	CO6	5 Marks

UNIT-II

3	a)	Derive the expression for NBFM if message is m(t) and carrier is $A_c Cos\omega_c t$. Draw the corresponding phasor diagram of NBFM and compare it with AM wave	CO2	8 Marks
	b)	An FM wave is defined by s(t)=10 cos(2+sin (6Πt). Find the instantaneous frequency of s(t).	CO4	6 Marks
		(OR)		
4	a)	What is Carson's rule? Show that it applies both to narrow band and wide band FM.	CO2	8 Marks
	b)	Calculate for An angle-modulated signal has the form: $u(t)=100\cos[2\pi f_c t+4\sin 2\pi f_m t]$ Where f_c=10MHz and f_m=1000Hz. i) Assuming that this is an FM signal, determine the modulation index and the transmitted signal bandwidth. ii) Assuming that this is an PM signal, determine the modulation index and the transmitted signal bandwidth.	CO4	6 Marks

UNIT-III

5	a)	Discuss the role of pre-emphasis and de-emphasis in the improvement of noise immunity in FM.	CO1	8 Marks
	b)	Prove that the figure of merit of AM system for single stone modulation with 100% modulation is 1/3.	CO3	6 Marks
		(OR)		
6	a)	Explain the noise performance in SSB - SC receiver and prove its S/N ratio is unity.	CO2	8 Marks
	b)	The noise figure of an amplifier is 5dB and its input S/N ratio is 55dB. Find the output S/N ratio.	CO3	6 Marks

UNIT-IV

7	a)	Determine the modulation index and maximum deviation of a single tone FM signal represented by $v(t)=12 \text{ Cos } (8 \times 10^8 t+6 \sin (1250t)$	CO4	8 Marks
	b)	In a broadcast super heterodyne receiver tuning at 1400 kHz having no RF amplifier, the loaded Q of the antenna coupling circuit is 100, By Considering standard IF frequency determine the Image frequency and its rejection ratio.	CO6	6 Marks
		(OR)		

8	a)	In a superhetrodyne receiver with no RF section, the 'Q' of the antenna coupling circuit is found to be 110. Calculate the image frequency and its rejection ratio at 1100 kHz.	CO6	9 Marks
	b)	An FM radio link has a frequency deviation of 25 kHz. The modulating frequency is 5 kHz. Calculate the bandwidth needed for the link. What will be the bandwidth if the deviation is reduced to 10 kHz?	CO4	5 Marks

UNIT-V

9	a)	Discuss the performance analysis of pulse modulation schemes.	CO1	6 Marks
	b)	Draw the wave forms of pulse modulations and explain briefly.	CO1	8 Marks

(OR)

10	a)	List out the applications of pulse Modulation techniques	CO1	7 Marks
	b)	For a pulse amplitude modulated transmission of voice signal having maximum frequency equal to f_m=4kHz, calculate the transmission bandwidth. It is given that the sampling frequency f_s=10 kHz and the pulse duration t=0.1T_s.	CO4	7 Marks

❀ ❀ ❀

CODE No.: 16BT40402 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

DIGITAL IC APPLICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Sketch the circuit diagram of 2-inout LS TTL NAND gate and explain.	CO1	7 Marks
	b)	Compare CMOS, TTL and ECL with reference to logic levels, DC Noise margin, propagation delay and fan-out.	CO2	7 Marks
		(OR)		
2	a)	Expand HC, HCT, VHC and VHCT in connection with CMOS family.	CO1	7 Marks
	b)	Suggest a method to estimate sinking current for low output and sourcing current for high output of CMOS gate.	CO2	7 Marks
		UNIT-II		
3	a)	Suggest alternative forms of representing blocks in structural design model of Verilog HDL with an example.	CO5	7 Marks
	b)	Discuss the role of simulation and synthesis.	CO1	7 Marks
		(OR)		
4	a)	Identify the alternate representations of conditional and looping statements.	CO5	7 Marks
	b)	List and explain operators used in verilog HDL.	CO1	7 Marks
		UNIT-III		
5	a)	Design the function F = ABC + (A+B+C)' by using 74 x 138 and explain its operation.	CO4	7 Marks
	b)	Design a full adder using two half adders. Write VHDL data flow program for the same.	CO3	7 Marks
		(OR)		
6	a)	Design a 32 x 1 mux using 74 x 138 and 74 x 151 ICs.	CO4	7 Marks
	b)	Design 16 x 1 multiplexer by using 2 x 1 multiplexer and explain its operation.	CO3	7 Marks
		UNIT-IV		
7	a)	Illustrate the operation of 4-bit ring counter.	CO1	7 Marks
	b)	Design self correcting 4 bit, 4-state ring counter with single circulating 1.	CO6	7 Marks
		(OR)		
8	a)	Illustrate the structure of synchronous system design and its operations performed during one clock cycle.	CO1	7 Marks
	b)	Design a 4 bit,8 states Johnson counter using IC 74 x 194. Show how the same counter can be modified as a self correcting Johnson counter.	CO6	7 Marks
		UNIT-V		
9	a)	Assess the waveforms of DRAM and SDRAM.	CO2	7 Marks
	b)	Compare between PROM, PLA and PAL.	CO2	7 Marks
		(OR)		
10	a)	Appraise the operation of SRAM with a bidirectional data bus.	CO2	7 Marks
	b)	Design an 8 x 4 diode ROM using 74 x 138 for the following data starting from the first location. 1, 4, 9, B, A, 0, F, C.	CO3	7 Marks

❀ ❀ ❀

CODE No.: 16BT40403 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC16) Supplementary Examinations January – 2022

ELECTROMAGNETIC THEORY AND TRANSMISION LINES
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	State Coulomb's law. Develop the vector expression for Force due to N number of Charges.	CO1	7 Marks
	b)	A point charge of 30nC is located at the origin while plane y=3 carries charge 10nC/m^2. Find D at (0, 4, 3).	CO4	7 Marks
		(OR)		
2	a)	In a cylindrical conductor of radius 2mm, the current density varies with distance from the axis according to J = $10^3 e^{-400r}$ A/m^2. Find the total current I.	CO4	7 Marks
	b)	Define Electric Potential. Relate E and V.	CO1	7 Marks

UNIT-II

3	a)	Explain Faraday's Law for Time Varying Fields.	CO1	7 Marks
	b)	A conducting circular loop of radius 20cm lies in the z=0 plane in a magnetic field B = 10 cos 377t a_z mWb/m^2. Calculate the induced voltage in the loop.	CO2	7 Marks
		(OR)		
4	a)	Derive the magnetic boundary conditions as the conditions that H (or B) field must satisfy at the boundary between two different media.	CO2	7 Marks
	b)	Justify Lenz's Law for Magnetic Fields.	CO1	7 Marks

UNIT-III

5	a)	Derive the Wave Equations for Dielectric and Conducting Medium.	CO5	7 Marks
	b)	Suggest a method to categorize good conductors and good dielectrics.	CO6	7 Marks
		(OR)		
6	a)	Define Skin Effect and Skin Depth. Relate Skin depth and Frequency.	CO5	7 Marks
	b)	A plane wave propagating through a medium with ε_r=8, μ_r = 2 has E = 0.5 $e^{-z/3}$ sin(10^8t - βz) a_x V/m. Determine: i) β. ii) The loss tangent. iii) Wave impedance. iv) Wave velocity. v) H field.	CO6	7 Marks

UNIT-IV

7	a)	Develop the basic Transmission Line Equations and derive the secondary constants of transmission lines using them.	CO2	8 Marks
	b)	Derive the voltage and current equations for transmission lines.	CO3	6 Marks
		(OR)		
8	a)	Design a transmission line for a characteristic impedance of 50Ω. Assume R=6Ω/Km and G=0.25x10^{-3} mhos/Km.	CO3	6 Marks
	b)	Analyze the variations in phase and group velocities for distortionless lines.	CO2	8 Marks

UNIT-V

9	a)	Explain the principle of stub matching. List the types of stub matching used in practice.	CO1	8 Marks
	b)	The VSWR measured on UHF transmission line at a frequency of 300MHz found to be 2. If the distance between load and voltage minimum is 0.8m, solve the normalized load impedance.	CO4	6 Marks

(OR)

10	a)	Identify and summarize the various methods for impedance matching.	CO1	8 Marks
	b)	A generator of 1V, 1KHz supplies power to a 100 km transmission line terminated in a 200Ω resistance. The line parameters are R= 10 Ω/km, L=3.8 mH/km, G=1μ mho/km and C=0.0085 μf/km. Calculate the input impedance and reflection coefficient.	CO4	6 Marks

CODE No.: 16BT40404 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, January 2022

LINEAR IC APPLICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Draw and explain the operation of dual input balanced output differential amplifier.	CO1	7 Marks
	b)	Derive the voltage gain of a dual input balanced output differential amplifier.	CO2	7 Marks
		(OR)		
2	a)	Explain the operation of differential amplifier with neat circuit diagram.	CO1	7 Marks
	b)	For a differential amplifier R_c=1 kΩ, R_{in}=1 kΩ, h_{fe}=1 kΩ and R_E=2 kΩ neglecting h_{oe}. Calculate the difference mode gain and common mode gain. Also calculate CMRR in dB. The amplifier is a dual input balanced differential amplifier.	CO2	7 Marks

UNIT-II

3	a)	In an inverting adder circuit, the input voltages ate 0.3 V, 0.5 V, 0.1 V while R_1=R_2=R_3=1 kΩ, If R_f = 10 kΩ . Calculate the output voltage.	CO3	7 Marks
	b)	Construct a circuit to realize $V_{out} = 10v_1 + 20v_2 - 5v_3$.	CO4	7 Marks
		(OR)		
4	a)	In an integrator circuit, $R_i C_f$ = 1 sec, and the input is a step input V_{in} = 2V for $0 \le t \le 4$. Determine the output voltage and sketch it.	CO4	7 Marks
	b)	How can a multiplier and divider circuit be constructed with log and antilog amplifiers?	CO3	7 Marks

UNIT-III

5	a)	Design a LPF with cutoff frequency f_c = 1 KHz, R_0 = 600Ω.	CO3	7 Marks
	b)	Distinguish between passive and active filter.	CO1	7 Marks
		(OR)		
6	a)	Design a wide band pass filter having f_l = 400 Hz, f_h = 2KHz and pass band gain of four. Determine the Q of the filter.	CO3	7 Marks
	b)	Explain how an all pass filter can be realized.	CO1	7 Marks

UNIT-IV

7	a)	Explain the following terms with respect to PLL: i) Free running state ii) Lock in range iii) Capture range iv) Pull in time	CO1	7 Marks
	b)	Operate 555 timer as monostable multivibrator. Derive the expression of time delay of a monostable multivibrator using 555 timer.	CO5	7 Marks
		(OR)		
8	a)	Realize a monostable multivibrator using 555 timer to obtain pulse of width of 0.1 msec. Draw the circuit diagram with its waveforms.	CO5	7 Marks
	b)	Explain the application of PLL as frequency translator.	CO1	7 Marks

UNIT-V

9	a)	For the R-2R ladder 4 bit type DAC, Find the output voltage and resolution if digital input is 1111. assume $V_R = 10v$ and $R = 10K = Rf$	CO4	7 Marks
	b)	Explain the operation of flash type ADC.	CO1	7 Marks
		(OR)		
10	a)	Explain the operation of a R-2R ladder DAC and mention its applications.	CO1	7 Marks
	b)	Describe the transfer characteristic of a Digital to Analog convertor.	CO1	7 Marks

❀ ❀ ❀

CODE No.: 16BT40405 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC16) Supplementary Examinations January – 2022

PROBABILITY AND STOCHASTIC PROCESS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define probability based on set theory and fundamental axioms.	CO1	6 Marks
	b)	An experiment consists of tossing two dice. i) Find the sample space S. ii) Find the event A that the sum of the dots on the dice equals 7. iii) Find the event B that the sum of the dots on the dice is greater than **10.** iv) Find the event C that the sum of the dots on the dice is greater than **12.**	CO3	8 Marks

(OR)

2	a)	Define Joint Probability and Conditional Probability	CO1	6 Marks
	b)	In a box there are 100 resistances having resistance and tolerance shown in below table. If a resistor is chosen with same likelihood of being chosen for the three events, A as "draw a 47 ohm resistor', B as "draw a resistor with5% tolerance", C as "draw a 100 ohm resistor". i) Calculate joint probabilities. ii) Conditional probabilities.	CO3	8 Marks

Resistance (ohm)	Tolerance		
	5%	10%	Total
22	10	14	24
47	28	16	44
100	24	8	32
Total	62	38	100

Number of resistor in a box having given resistance and tolerance.

UNIT-II

3	a)	Determine whether the following is a valid distribution function. $F_x(x) = 1- \exp(-x/2)$ for x=0 and 0 elsewhere.	CO2	7 Marks
	b)	State and prove chebchev's inequality.	CO4	7 Marks

(OR)

4	a)	Find the expected value of the function $g(X) = X^2$ where X is a random variable defined by the density. $F_x(x) = ae^{-ax}U(x)$. Where a is a constant and U(x) is a unit step function.	CO2	7 Marks
	b)	Binary data are transmitted over a noisy communication channel in block of 16 binary digits. The probability that a received digit is in error as a result of channel noise is 0.01. Assume that the errors occurring in various digit positions within a block are independent. i) Find the mean and the variance of the number of errors per block. ii) Find the probability that the number of errors per block is greater than or equal to 4.	CO4	7 Marks

UNIT-III

5	a)	Define a Random Variable V and W by V=X+aY W= X-aY Where a is real number X and Y random variables, determine a in terms of X and Y such V and W are orthogonal.	CO2	7 Marks
	b)	Gaussian Random Variables X and Y have first and second order moments $m_{10} = -1.1$, $m_{20} = 1.16$, $m_{01} = 1.5$, $m_{20} = 2.89$, $R_{xy} = 1.724$. i) Find the C_{xy}, ρ . ii) Write expression for Jointly Gaussian Density function.	CO3	7 Marks

(OR)

6	a)	Explain the Linear Transformation of Gaussian Random Variables.	CO1	7 Marks
	b)	Two Gaussian Random Variables X_1 and X_2 have zero means and variances 4 and 9. Their Covariance is equal to 3. If X_1 and X_2 are linearly transformed to new variables Y_1 and Y_2 according to: $Y_1 = X_1 - 2X_2$ $Y_2 = 3X_1 + 4X_2$ Find : (i) Mean. (ii) Variances. (iii) Covariance of Y_1 and Y_2.	CO2	7 Marks

UNIT-IV

7		A random process is defined by x(t) =A where A is a continuous random variable uniformly distributed on (0,1) and t represents time. Find i) E [x (t)]. ii) R_{xx} [t; t + τ]. iii) Is the process stationary?	CO2	14 Marks

(OR)

8		Let two random processes X(t) and Y(t) be defined by X(t) = A cos ω_0t+B sin ω_0t ; Y(t) = B cos ω_0t - A sin ω_0t where A and B are random variables and ω_0 is a constant. Assume A and B are uncorrelated, zero mean random variables with same variance. Show that X(t) and Y(t) are jointly stationary.	CO3	14 Marks

UNIT-V

9	a)	Mention the differences between correlated and uncorrelated noise.	CO1	7 Marks
	b)	Obtain expression for Noise figure in terms of Equivalent noise temperature for an amplifier.	CO3	7 Marks

(OR)

10	a)	Discuss the following terms: i) Noise factor. ii) Noise Figure equivalent noise temperature.	CO1	7 Marks
	b)	Derive the expression for thermal noise voltage.	CO3	7 Marks

CODE No.:16BT40406 SVEC16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC16) Supplementary Examinations January – 2022

PULSE AND DIGITAL CIRCUITS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	How to implement an integrator with RC low pass filter?	CO2	7 Marks
	b)	Derive the expression for output from a ringing circuit.	CO2	7 Marks
		(OR)		
2.	a)	Obtain the response of RC High Pass Circuit for a square wave input for different Time Constants and evaluate %Tilt.	CO1	8 Marks
	b)	Justify how a Low-pass RC circuit acts as an Integrator.	CO2	6 Marks

UNIT-II

3.	a)	Design a diode clamper circuit to clamp the positive peak of the input signal at zero level. The frequency of input signal is 500Hz. (Assume R_f=100Ω, R_r=150KΩ and Let RC=20T).	CO3	8 Marks
	b)	Apply appropriate control signals to synchronize input and output signals of a clamping circuit.	CO5	6 Marks
		(OR)		
4.	a)	What are the limitations of diode as a shunt element in clipping circuits?	CO3	7 Marks
	b)	Explain the operation of a comparator circuit.	CO2	7 Marks

UNIT-III

5.	a)	Derive the expression for frequency oscillations of an astable multivibrator.	CO4	7 Marks
	b)	Explain indetail about turn-on and turn-off times in a transistor switch.	CO3	7 Marks
		(OR)		
6.	a)	Design a collector-coupled monostable multivibrator with a gate width of 5ms using n-p-n silicon transistors.	CO3	8 Marks
	b)	With the help of neat diagrams, discuss the different methods of triggering a binary.	CO1	6 Marks

UNIT-IV

7.	a)	How to generate sweep voltage using Bootstrap principle?	CO3	7 Marks
	b)	Explain in detail about the operation of current sweep circuit.	CO5	7 Marks
		(OR)		
8.	a)	Explain the basic principles of Bootstrap Time-base generator.	CO1	6 Marks
	b)	Explain the principle and working of a Transistor Current Time-Base generator.	CO1	8 Marks

UNIT-V

9.	a)	Implement NOR gate using CMOS logic.	CO1	7 Marks
	b)	Explain the operation of TTL logic family.	CO1	7 Marks
		(OR)		
10.	a)	Draw and explain the operation of Bidirectional sampling gate.	CO1	7 Marks
	b)	Draw and explain the operation of ECL NOR/OR circuit.	CO1	7 Marks

CODE No.: 16BT40501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

COMPUTER GRAPHICS
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Define Horizontal and Vertical tracing.	CO1	4 Marks
	b)	Evaluate Midpoint ellipse algorithm with the parameters $r_x = 8$ and $r_y = 6$ and the initial point is (7, 3).	CO6	10 Marks
		(OR)		
2	a)	Explain the architecture of a Random-scan system with a graphics controller.	CO1	10 Marks
	b)	Explain Graphics monitors and Workstations.	CO1	4 Marks
		UNIT-II		
3	a)	Write the basic 2-Dimensional Transformation principles in detail.	CO3	8 Marks
	b)	Describe basic transformations between the Co-ordinate systems.	CO1	6 Marks
		(OR)		
4	a)	Develop Boundary-fill algorithm to fill the specified area.	CO4	8 Marks
	b)	Discuss the failure of Boundary fill algorithm to fill the specified area with a suitable example.	CO2	6 Marks
		UNIT-III		
5	a)	Describe 2-Dimensional viewing co-ordinate Reference frame.	CO1	4 Marks
	b)	Explain 2-Dimensional Viewing functions in detail.	CO1	10 Marks
		(OR)		
6	a)	Write short notes on spline specifications.	CO3	7 Marks
	b)	Write an algorithm to display three dimensional cubic Bezier curve, given a set of four control points in the XY plane.	CO3	7 Marks
		UNIT-IV		
7	a)	Explain various Coordinate systems in 3-Dimensional Viewing.	CO1	8 Marks
	b)	Differentiate Oblique and Orthographic parallel projections.	CO2	6 Marks
		(OR)		
8	a)	Write a routine to reflect an object about an arbitrarily selected plane.	CO3	7 Marks
	b)	Show a method to rotate a 3-Dimensional object above an axis that is not parallel to the coordinate axis with a neat block diagram and derive the transformation matrix for the same.	CO5	7 Marks
		UNIT-V		
9	a)	Write short note on BSP-tree method.	CO3	7 Marks
	b)	Explain procedure for Area subdivision method.	CO1	7 Marks
		(OR)		
10	a)	Describe procedure for Octree methods.	CO1	7 Marks
	b)	Explain Gouraud and Phong Shading along with their advantages and disadvantages.	CO1	7 Marks

❀ ❀ ❀

CODE No.: 16BT40502 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC16) Supplementary Examinations January – 2022

DATABASE MANAGEMENT SYSTEMS
[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain DDL and DML commands in detail with examples.	CO5	7 Marks
	b)	What are the various responsibilities of a DBA? Explain.	CO2	7 Marks
		(OR)		
2	a)	Describe about relationships and relationship sets.	CO1	7 Marks
	b)	What is the purpose of Database Systems? Explain.	CO3	7 Marks

UNIT-II

3	a)	Consider the following relational schema Employee(empno, name, office, age) Books(isbn, title, author, publisher) Loan(empno, isbn, data) Write the following queries in relational algebra. i) Find the names of employees who have borrowed a book published by McGraw-Hill. ii) Find the names of employees who have borrowed all books published by McGraw-Hill. iii) Find the names of employees who have borrowed more than five different books published by McGraw-Hill. iv) For each publisher, find the names of employees who have borrowed.	CO4	7 Marks
	b)	Discuss about relational algebra with suitable example.	CO1	7 Marks
		(OR)		
4	a)	Describe the properties of a relational algebra.	CO2	7 Marks
	b)	What is a view? How views are implemented?	CO5	7 Marks

UNIT-III

5	a)	Explain about correlated nested queries with examples.	CO5	7 Marks
	b)	Illustrate redundancy and the problems that it can cause.	CO2	7 Marks
		(OR)		
6	a)	Compare and contrast BCNF with 3NF.	CO2	7 Marks
	b)	Describe properties of decompositions.	CO1	7 Marks

UNIT-IV

7	a)	Describe validation based locking protocol.	CO1	7 Marks
	b)	Discuss in detail Multiple Granularity.	CO3	7 Marks
		(OR)		
8	a)	What is a transaction? In what way it differs from an ordinary program?	CO2	7 Marks
	b)	What is Atomicity? Explain about implementation of Atomicity.	CO5	7 Marks

UNIT-V

9	a)	Illustrate deletion of an element in B+ trees with an example.	CO4	7 Marks
	b)	Explain about Primary and Secondary Indexes.	CO1	7 Marks
		(OR)		
10	a)	Differentiate between clustered and unclustered indexes.	CO2	7 Marks
	b)	What is the purpose of indexing? How this can be done by B+ tree? Explain.	CO1	7 Marks

CODE No.: 16BT41002 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, January 2022

LINEAR AND DIGITAL ICS

[Common to Electrical and Electronics Engineering; Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Draw the pin diagram and schematic symbol of a typical OP-AMP IC741 and explain the function of each pin.	CO2	5 Marks
	b)	Identify the basic types of linear IC packages and briefly explain the characteristics of each.	CO5	4 Marks
	c)	State two types of integrated circuits classified according to their mode of operation and briefly explain the significance of each.	CO1	5 Marks
		(OR)		
2	a)	Draw the equivalent circuit diagram of non-inverting amplifier and derive the expression for input impedance.	CO2	7 Marks
	b)	Design a digital circuit to implement an inverting amplifier with an input resistance of 10KΩ and a gain of-5.	CO3	7 Marks

UNIT-II

3	a)	Write a short note on the following applications of operational amplifier. i) AC Amplifier ii) Antilog amplifier	CO1	6 Marks
	b)	Apply a suitable modeling techniques and design an analog IC to differentiate an input signal that varies in frequency from 10Hz to about 1KHz. Draw its output waveform if $\sin 2\pi \times 1000t$ signal is applied.	CO5	8 Marks
		(OR)		
4	a)	Determine the order of the Butterworth low-pass filter so that is to provide 40dB attenuation at W/Wh=2.	CO4	7 Marks
	b)	Determine the output voltage and sketch the integrator circuit, R_i =10 k**Ω** C_F = 0.02 μ**F**, and the input is a step input V_{in}=2V for $0 \leq t \leq 4$.	CO4	7 Marks

UNIT-III

5	a)	Design a monostable multivibrator using 555 timer to produce a pulse width of 100 m sec.	CO6	7 Marks
	b)	Explain the operation of a successive approximation type Analog to Digital converter.	CO2	7 Marks
		(OR)		
6	a)	Give the functional block diagram of NE 565 PLL (DIP) and for the given component values. C1 = 390 pF, C2 = 680 pF and R1 = 10k**Ω**, V_{cc} = ±6V. Find; i) The free running frequency ii) The lock range and capture range Where C1 is the capacitor connected between pin number 9 and −VCC , C2 is the capacitor connected between +VCC and output pin 7, and R1 is connected between pin number 8 and +VCC.	CO4	7 Marks
	b)	Apply appropriate modeling techniques and design an 555 IC timer to implement Astable multivibrator to operate at 10 KHz with 40% duty cycle.	CO5	7 Marks

UNIT-IV

7	a)	Assess the CMOS dynamic electrical characteristics.	CO2	7 Marks
	b)	Design a suitable digital circuit to perform CMOS NAND gate and verify the Boolean function.	CO5	7 Marks

(OR)

8	a)	Define and summarize structural design. Appraise the use of structural design elements in Verilog HDL.	CO2	10 Marks
	b)	Draw the circuit diagram of basic CMOS gate and explain the operation.	CO2	4 Marks

UNIT-V

9	a)	Implement suitable design technique for a 16-bit comparator using 74x85 ICs?	CO5	7 Marks
	b)	Develop a verilog program for a MOD 10 counter.	CO6	7 Marks

(OR)

10	a)	Develop a Verilog program for a 8-bit serial-in and parallel-out shift register in behavioral model.	CO6	7 Marks
	b)	Design a suitable digital circuit to detect the prime number of a 5-bit input, write a structural Verilog program for the design.	CO5	7 Marks

CODE No.: 16BT41041 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC16) Supplementary Examinations January – 2022

COMPUTER ARCHITECTURE AND ORGANIZATION

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain about single bus structure and list the advantages and disadvantages.	CO1	7 Marks
	b)	Write the expression for assessment of performance of a computer. On what factors does the performance of a computer depend? Explain the means of improving the performance of a computer.	CO2	7 Marks
		(OR)		
2	a)	Illustrate the data storage mechanism in a magnetic disk.	CO1	7 Marks
	b)	Analyze the working of static RAM cell.	CO2	7 Marks

UNIT-II

3	a)	Explain the flag register of 8085 microprocessor. What are the contents of Flag register after the execution of the instruction SUB D. Let the registers be A = 3BH and D = 69H.	CO1	6 Marks
	b)	Discuss about the following instructions of 8085 microprocessor. i) LDA. ii) MVI. iii) CALL. iv) RAR.	CO2	8 Marks
		(OR)		
4	a)	Describe the control and status signals of 8085 microprocessor.	CO1	7 Marks
	b)	Discuss the logical instructions of 8085 microprocessor. Give their applications in real time.	CO3	7 Marks

UNIT-III

5	a)	Classify the interrupts of 8085 microprocessor.	CO1	7 Marks
	b)	Write an 8085 program to perform multiplication of two bytes by successive addition and store the result in memory.	CO5	7 Marks
		(OR)		
6	a)	Discuss the interrupt handling mechanism of an 8085 microprocessor.	CO1	7 Marks
	b)	Differentiate between maskable and non-maskable interrupts. Give their applications.	CO2	7 Marks

UNIT-IV

7	a)	Design a digital circuit that performs the four logic operations of AND, OR, NOT, XOR. Use two selection variables. Show the logic diagram of one typical stage.	CO3	7 Marks
	b)	List and briefly explain the registers of a basic computer.	CO1	7 Marks
		(OR)		
8	a)	Design a bus line with three state buffers.	CO3	7 Marks
	b)	What is Micro-operation? Briefly explain the arithmetic micro-operations.	CO1	7 Marks

UNIT-V

9	a)	With a suitable example, demonstrate the signed 2's complement addition and subtraction. Implement it with minimal hardware.	CO6	7 Marks
	b)	Discuss Out-of-order execution of a program.	CO1	7 Marks
		(OR)		
10		Design a microprogram sequencer for control memory. Derive the truth table for the input logic circuit.	CO3	14 Marks

❀ ❀ ❀

CODE No.: 16BT41201 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, January 2022

DESIGN AND ANALYSIS OF ALGORITHMS

[Common to Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

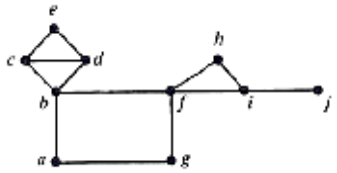
1	a)	Design an algorithm to check whether given number is even or odd.	CO5	6 Marks
	b)	Predict the space complexity and time complexity for the above algorithm.	CO5	8 Marks

(OR)

2	a)	Solve the recurrence relation and give a Big-Oh bound for each of them $T(n) = 49\ T(n/25) + n^{3/2} \log n$.	CO5	7 Marks
	b)	Prove $3n^3 + 2n^2 = O(n^3)$.	CO4	7 Marks

UNIT-II

3	a)	Outline an algorithm for obtaining bi-connected components.	CO1	7 Marks
	b)	Identify the bi-connected components in the following graph	CO3	7 Marks



(OR)

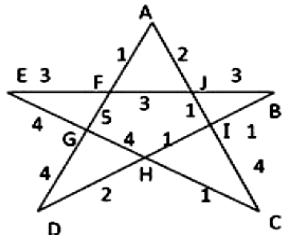
4	a)	Explain the following with an example: i) Spanning Tree ii) Connected components iii) Strongly connected components.	CO1	7 Marks
	b)	Find a necessary and sufficient condition for the root of a DFS for a connected graph to be an articulation point. Prove it.	CO4	7 Marks

UNIT-III

5	a)	Explain Strassen's matrix multiplication in detail with an example.	CO1	9 Marks
	b)	Distinguish between merge sort and quick sort.	CO2	5 Marks

(OR)

6	a)	Outline an algorithm for Prim's algorithm.	CO1	7 Marks
	b)	Apply Traveling Salesman Problem to the graph given below.	CO3	7 Marks



UNIT-IV

7	a)	Estimate the minimum no. of operations required for the following chain matrix multiplication using dynamic programming. A(30,40) * B(40,5) * C(5,15) * D(15,6).	CO5	9 Marks
	b)	Distinguish between Dynamic Knapsack and Greedy method Knapsack problem.	CO2	5 Marks

(OR)

8	a)	Explain in detail about Hamiltonian cycles.	CO1	7 Marks
	b)	Outline an algorithm to solve n-queen problem.	CO1	7 Marks

UNIT-V

9		Design the state space tree using LCKNAP for the knapsack instances: N=5; (p1,p2,…p5)=(10, 15, 6, 8, 4); (w1,w2,…w5)=(4, 6, 3, 4, 2) and M=12.	CO5	14 Marks

(OR)

10	a)	Outline an algorithm to solve the Knapsack problem with the Branch and Bound.	CO1	7 Marks
	b)	Explain the principles of LIFO Branch and Bound.	CO1	7 Marks

CODE No.: 16BT41202 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC16) Supplementary Examinations January – 2022

JAVA PROGRAMMING

[Computer Science and Engineering, Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What are all the characteristic features of Java Programming language?	CO1	6 Marks
	b)	Compare and contrast visibility controls and also compare with each of them.	CO2	8 Marks
		(OR)		
2	a)	"Java is platform independent". Justify?	CO4	6 Marks
	b)	Compare and Contrast Java with C. Explain Constructors with examples.	CO2	8 Marks

UNIT-II

3	a)	Explain the importance of inheritance with the help of an example.	CO1	5 Marks
	b)	What are packages? What are the benefits of creating programs using packaging?	CO1	5 Marks
	c)	How to create an interface? Distinguish between abstract classes and interfaces.	CO1, CO2	4 Marks
		(OR)		
4	a)	How is multiple inheritance achieved in Java?	CO1	3 Marks
	b)	Develop a Library interface which has drawbook(), returnbook() (with fine), checkstatus() and reservebook() methods. All the methods tagged with public.	CO6	11 Marks

UNIT-III

5	a)	Differentiate between exceptions , runtime errors and compile time errors	CO2	4 Marks
	b)	Difference between Thread and Process in Java. How to implement Thread in Java?	CO2	5 Marks
	c)	Develop a java program to read 20 marks and store them in an array. Define your own exception named wrongmark exception. Throw and catch this type of exception when a mark is (<0 and >100).	CO3	5 Marks
		(OR)		
6	a)	When to use Runnable *vs* Thread in Java? Difference between start() and run() method of Thread class.	CO2	4 Marks
	b)	Differentiate throw and throws keyword in Java. Can the same exception been declared to be thrown many times by the method. Eg: public void sample() throws IOException, SQLException	CO1	5 Marks
	c)	Develop a java program for producer consumer problem to illustrate the concept of multithreading.	CO3	5 Marks

UNIT-IV

7	a)	What is an Event? Explain the role of Event handler in AWT.	CO1	5 Marks
	b)	Design and develop an Applet to receive the value of the parameter message from the html file and display it on the webpage.	CO3	9 Marks
		(OR)		
8	a)	What is Java Collections Framework? List out some benefits of Collections framework.	CO1	6 Marks
	b)	Create an anonymous inner class for handling mouse entered event into an Applet.	CO5	8 Marks

UNIT-V

9	a)	List and explain the different situations in which the Action Event is generated. Develop the event handler for the Action Event.	CO2, CO4	10 Marks
	b)	Explain the life cycle methods of a servlet.	CO4	4 Marks
		(OR)		
10	a)	Create a servlet to store the user's browsing preferences like color in a cookie and should be displayed in the color	CO5	4 Marks
	b)	List and explain the different situations in which the Action Event is generated. Develop the event handler for the Action Event.	CO2, CO4	10 Marks

CODE No.: 16BT41203 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC16) Supplementary Examinations January – 2022

SOFTWARE ENGINEERING
[Computer Science and Engineering, Information Technology Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Illustrate and explain Evolutionary Models.	CO1	14 Marks
		(OR)		
2	a)	Demonstrate Software Process framework with five framework Activities.	CO2	7 Marks
	b)	Explain Waterfall Model with a neat sketch.	CO1	7 Marks

UNIT-II

3	a)	Examine how mathematical notations can be used to express a functional requirement in it and explain with examples.	CO2	7 Marks
	b)	Outline the Requirement Elicitation and Analysis process with a neat sketch.	CO1	7 Marks
		(OR)		
4		Design a sequence diagram that models the data processing involved when a customer withdraws cash from the bank ATM machine.	CO3	14 Marks

UNIT-III

5		List different types of architectural styles exist in software and explain in detail.	CO1	14 Marks
		(OR)		
6		Compare all types of metrics in the Software Measurements.	CO6	14 Marks

UNIT-IV

7		Explain the steps involved in Debugging process with a neat sketch and discuss all the Strategies involved in the Debugging Process.	CO5	14 Marks
		(OR)		
8	a)	Compare and contrast three types of testing involved in Control Structure Testing.	CO1	10 Marks
	b)	Explain: i) Verification and validation. ii) Organizing for Software Testing.	CO4	4 Marks

UNIT-V

9	a)	Explain about Defect Amplification Model.	CO1	7 Marks
	b)	Discuss the steps involved in Business Process Reengineering model with a neat sketch.	CO6	7 Marks
		(OR)		
10	a)	Define SQA. List and explain SQA Activities.	CO1	8 Marks
	b)	Explain different types of risks involved in Software Risks.	CO4, CO6	6 Marks

❀ ❀ ❀

CODE No.: 16BT41204 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

THEORY OF COMPUTATION

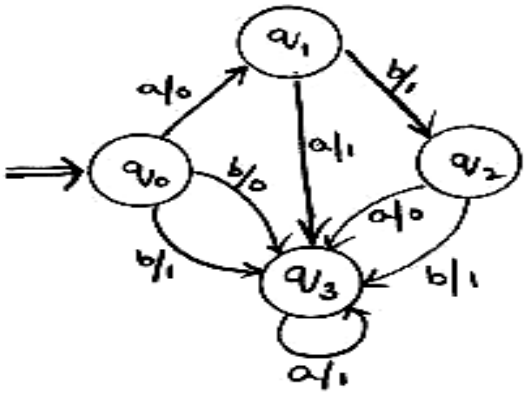
[Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

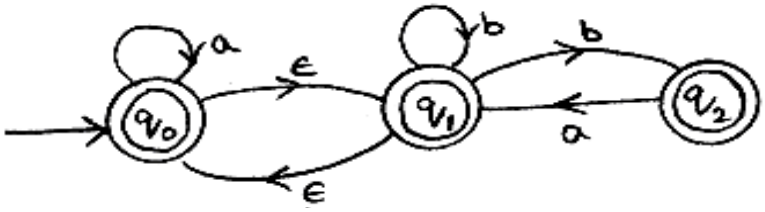
UNIT-I

1	a)	Define the following terms, with an example for each. i) String. ii) Alphabet. iii) Problem. iv) Language.	CO1	8 Marks
	b)	Construct Moore machine for the following Melay machine.	CO3	6 Marks



(OR)

2	a)	Construct DFA equivalent to the following Finite automation.	CO3	8 Marks



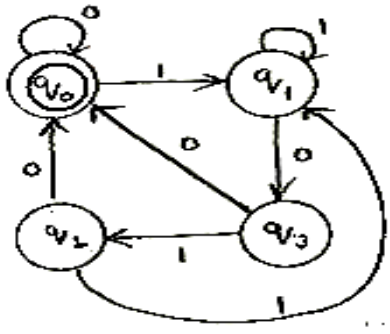
	b)	Draw the NFA accepting the set of all strings whose second symbol from last is 1.	CO3	6 Marks

UNIT-II

3	a)	Construct a Finite Automata equivalence to the regular expression (0+1)*(00+11)(0+1)*.	CO3	8 Marks
	b)	Write a regular expression to denote a language L which accepts all the strings which begin or end with either 00 or 11.	CO3	6 Marks

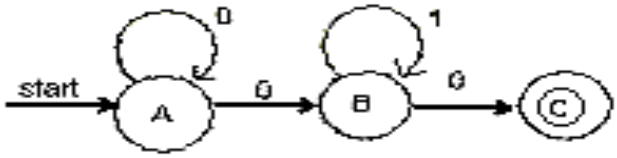
(OR)

4	a)	Write a regular expression for the language over the set Σ={a,b} in which total number of a's are divisible by 3	CO3	6 Marks
	b)	Consider the FA given; construct a regular expression that is accepted by it.	CO3	8 Marks



UNIT-III

5	a)	For the following Finite State automata construct an equivalent grammar.	CO5	10 Marks



	b)	Define the following. i) Derivation. ii) Parse tree.	CO1	4 Marks

(OR)

6	a)	Find the language generated by the grammar : S→0S1 | 0A | 0 |1B | 1 A→0A | 0 B→1B | 1	CO1	6 Marks
	b)	Discuss in detail about ambiguous grammar and removing ambiguity from grammar.	CO2	8 Marks

UNIT-IV

7	a)	Design PDA for the language $L=\{wcw^R \mid w \in \{0,1\}^*\}$.	CO3	10 Marks
	b)	If L is a context free language then prove that there exists a PDA M such that L = N(M).	CO2	4 Marks

(OR)

8	a)	Obtain a PDA to accept the language $\{L = a^n b^{2n} \mid n \geq 1\}$.	CO3	12 Marks
	b)	Prove that acceptance by empty stack and by final state is equivalent.	CO2	2 Marks

UNIT-V

9		Design a Turing machine which recognizes palindrome over alphabet {0,1}.	CO4	14 Marks

(OR)

10		Explain in detail about Universal Turing machine.	CO1	14 Marks

CODE No.:16BT30401 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations July – 2022

ELECTRONIC CIRCUIT ANALYSIS AND DESIGN

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What is the basis for the classification of amplifier and also discuss about different amplifiers?	CO1	7 Marks
	b)	Derive the expression for voltage gain of the common emitter amplifier with eimmer resistor.	CO1	7 Marks
		(OR)		
2	a)	What is the effect of cascading on the overall bandwidth?	CO4	7 Marks
	b)	Why the frequency response of cascode amplifier is better in comparison to cascade configuration?	CO4	7 Marks

UNIT-II

3	a)	What is the effect of coupling capacitor on the frequency response of an amplifier?	CO4	7 Marks
	b)	Derive the expression for common emitter short circuit gain as a function of frequency.	CO2	7 Marks
		(OR)		
4	a)	Draw the hybrid-π model of the BJT and explain its components.	CO1	7 Marks
	b)	Derive the expression for frequency range over which hybrid-π model is valid.	CO1	7 Marks

UNIT-III

5	a)	Derive the expression for transfer gain, input and output impedances of voltage shunt feedback amplifier.	CO3	7 Marks
	b)	Compare RC and LC oscillators in all respects.	CO3	7 Marks
		(OR)		
6		Derive the expression for frequency of oscillations of RC phase shift oscillator using FET and also get the magnitude condition.	CO3	14 Marks

UNIT-IV

7	a)	Compare series fed and transformer coupled power amplifier in all respects.	CO2	7 Marks
	b)	What is harmonic distortion and derive the expression for total harmonic distortion?	CO2	7 Marks
		(OR)		
8	a)	Draw the circuit diagram of complementary symmetry push pull amplifier and explain its operation.	CO2	7 Marks
	b)	Derive the expression for maximum efficiency of class B push-pull amplifier.	CO2	7 Marks

UNIT-V

9	a)	Draw the circuit diagram of single tuned amplifier and explain its operation.	CO1	7 Marks
	b)	What are the causes of instabilities in tuned amplifiers?	CO1	7 Marks
		(OR)		
10		Derive the expression for bandwidth of double tuned amplier.	CO1	14 Marks

❀ ❀ ❀

CODE No.:16BT30402 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations July – 2022

SIGNALS AND SYSTEMS
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

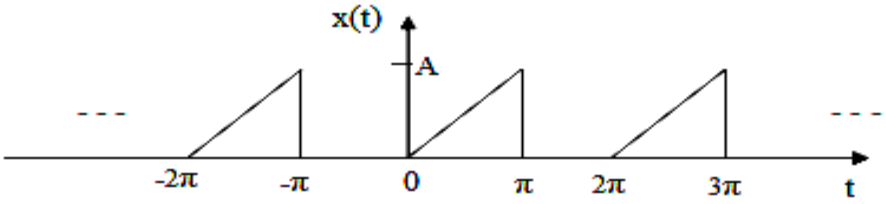
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Show that a composite signal is periodic if the ratio of their fundamental periods is rational.	CO4	6 Marks
	b)	Test whether the following signals are Energy signals or Power signals i) $x(t) = A \sin(w_0 t + \theta)$; ii) $x(t) = e^{j\left(3t+\frac{\pi}{2}\right)}$; iii) $x(t) = u(t)$.	CO4	8 Marks
		(OR)		
2	a)	Derive the condition for BIBO stability of an LTI system.	CO3	6 Marks
	b)	Check whether the following systems are: i) Linear or non-linear. ii) Static or Dynamic. *a*) $y(t) = x^2(t)$; *b*) $y(t) = e^{x(t)}$; *c*) $y(n) = 2x(n) + 4$.	CO3	8 Marks

UNIT-II

3	a)	Obtain the Trigonometrical Fourier series for the waveform as shown in figure below.	CO2	8 Marks



	b)	Write short notes on Complex Fourier Spectrum.	CO2	6 Marks
		(OR)		
4	a)	Find the Fourier transform of the following signals. i) $x(t) = t\, e^{-at}\, u(t)$; ii) $x(t) = \cos w_0 t\, u(t)$	CO2	8 Marks
	b)	Prove Parseval's Energy theorem using Fourier Transform.	CO2	6 Marks

UNIT-III

5	a)	State and prove the properties of Auto Correlation function.	CO1	7 Marks
	b)	Find Auto Correlation function and Energy Spectral Density of $x(t) = e^{-at}\, u(t)$	CO4	7 Marks
		(OR)		
6	a)	Show that periodic signal masked by noise can be obtained by using auto correlation.	CO1	7 Marks
	b)	Verify Parseval's theorem for the Energy signal $x(t) = e^{-4t}\, u(t)$.	CO4	7 Marks

UNIT-IV

7	a)	Find the inverse Laplace Transform of $X(s) = \dfrac{1}{(s+1)(s+2)(s+3)}$ for i) ROC: $Re(s) < -3$; ii) $Re(s)$: $-3 < Re(s) < -2$.	CO3	7 Marks
	b)	Explain how Laplace transform is useful in finding Causality and Stability of system in s-domain.	CO3	7 Marks
		(OR)		

8	a)	State and prove the following properties of Laplace Transform. i) Time Reversal; ii) Frequency Shift; iii) Final value theorem.	CO2	7 Marks
	b)	Given the transfer function $H(s) = \frac{s+3}{s^2+6s+8}$, find impulse response and step response of the system.	CO5	7 Marks

UNIT-V

9	a)	Determine the Nyquist rate and Nyquist interval for i) $x(t) = \text{sinc}^2(100\pi t)$ ii) $x(t) = \text{sinc}(80\pi t)\ \text{sinc}(120\pi t)$ iii) $x(t) = 1 + \cos(2000\pi t) + \sin(4000\pi t)$	CO1	8 Marks
	b)	Explain about the effect of under sampling.	CO1	6 Marks

(OR)

10	a)	Find inverse Z-transform of for $X(z) = \frac{1}{1-1.8z^{-1}+0.8z^{-1}}$ for ROC i) $0.8 < \lvert z \rvert < 1$ and ii) $\lvert z \rvert < 0.8$.	CO3	7 Marks
	b)	A causal LTI system is described by difference equation $y(n) = y(n-1) + y(n-2) + x(n) + 2x(n-1)$ Find system function and impulse response of the system.	CO5	7 Marks

CODE No.:16BT30403 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations July - 2022

SWITCHING THEORY AND LOGIC DESIGN

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Subtract the following binary numbers using 2's complement. i) 10110 – 1011. ii) 1100.10 – 111.01.	CO1	6 Marks
	b)	Express the following functions in a sum of minterms. i) $F = D(A' + B) + B'D$. ii) $F = y'z + wxy' + wxz' + w'x'z$.	CO1	8 Marks
		(OR)		
2	a)	The message below was coded in Hamming code and transmitted through a noisy channel. Decode the message assuming that a single bit error has occurred in the following code words. Assume even parity. i) 1011001 ii) 1100011.	CO1	8 Marks
	b)	Draw the logic diagram corresponding to the following Boolean expressions without simplifying them: i) $BC' + AB + ACD$. ii) $(A + B)(C + D)(A' + B + D)$.	CO4	6 Marks

UNIT-II

3	a)	Obtain the minimal expression $F = \Sigma_m (0, 1, 4, 6, 8, 9, 11) + d(2, 7, 13)$ using K-map.	CO5	6 Marks
	b)	Obtain the minimal expression $F = \Sigma_m (0, 2, 3, 6, 7, 8, 10, 11, 12, 15)$ using tabulation method.	CO5	8 Marks
		(OR)		
4	a)	Simplify the following Boolean functions using K-map: $F = A'B'CE' + A'B'C'D' + B'D'E' + B'CD' + CDE' + BDE'$.	CO5	8 Marks
	b)	Show that NAND is functionally complete.	CO2	6 Marks

UNIT-III

5	a)	Show that a full-subtractor can be constructed with two half-subtractors and an OR gate.	CO3	7 Marks
	b)	Implement the following Boolean function with a 8 x 1multiplexer. $F(A, B, C, D) = \Sigma_m (0, 3, 5, 6, 8, 9, 14, 15)$	CO2	7 Marks
		(OR)		
6	a)	Design a combinational circuit with four inputs that represent a decimal digit in *BCD* and four outputs that produce the 9's complement of the input digit.	CO3	7 Marks
	b)	A combinational circuit is defined by the following functions: $F_1 = x'y' + xyz'$; $F_2 = x' + y$; $F_3 = xy + x'y'$ Design the circuit with a decoder and OR gates.	CO2	7 Marks

UNIT-IV

7	a)	What is race around problem in JK flip-flops? Explain a method of eliminating this problem.	CO2	6 Marks
	b)	Draw the logic diagram of mod 6 ripple counter using T flip-flops and explain its operation with the help of timing waveforms.	CO5	8 Marks
		(OR)		
8	a)	Draw and explain a 4-bit bidirectional shift register with parallel load.	CO1	8 Marks
	b)	Convert T and JK flip-flops to D flip-flop.	CO2	6 Marks

UNIT-V

9	a)	Show how the PLA circuit would be programmed to implement the sum and carry outputs of a full-adder.	CO3	7 Marks
	b)	Implement the following Boolean functions using PAL: $F_1 = \Sigma_m (0, 2, 5, 7, 8, 10, 12, 13)$; $F_2 = \Sigma_m (0, 2, 6, 8, 9, 14, 15)$.	CO3	7 Marks

(OR)

10	a)	With the help of neat diagram, explain the operation of PAL.	CO3	6 Marks
	b)	Realize the following functions using PROM of size 8 x 3: $F_1 = \Sigma_m (0, 4, 7)$; $F_2 = \Sigma_m (1, 3, 6)$; $F_3 = \Sigma_m (1, 2, 4, 6)$	CO1	8 Marks

CODE No.:16BT40104 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations July – 2022

STRUCTURAL ANALYSIS - I
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		At a certain point on a body the stresses are 90MPa tensile in horizontal direction and 200MPa compressive in vertical direction and a clockwise shear stress of 50MPa.determine orientation of the principal planes, principal stresses, maximum shear stress and state of stress on an element 30 degrees counter clockwise from the current position.	CO2	14 Marks
		(OR)		
2	a)	Explain in detail about principal stress and principal strain conditions with neat sketches.	CO1	7 Marks
	b)	Derive the expression for the stresses acting in an inclined plane due to the forces acting in two mutually perpendicular directions.	CO1	7 Marks

UNIT-II

3		The span of a simply supported beam is 5m and it carries a point load of 50KN at its mid span. The moment of inertia for the left half of the beam is 3I and that for the right half is I. If I=20000cm^4 and E=2 x 10^{4}KN/cm^2, determine the slope at supports and deflection the centre.	CO2	14 Marks
		(OR)		
4	a)	Derive the governing differential equation for deflection of elastic beams.	CO4	7 Marks
	b)	A cantilever of length 'l' carrying a distributed load whose intensity varies uniformly from zero at the free end to 'w' per unit run at the fixed end. Using double integration method, find slope and deflection at the free end.	CO4	7 Marks

UNIT-III

5	a)	Derive Euler's formula for critical load of a column, when one end is fixed and other is hinged.	CO1	7 Marks
	b)	A hollow cast-iron column whose outside diameter is 200mm has a thickness of 20mm.it is 4m long and is fixed at both ends. Calculate the safe load by Rankine's formula using a factor of safety of 4. Calculate the slenderness ratio and the ration of Euler's and Rankine's critical loads. For cast-iron ultimate compressive stress=550MPa, α = 1/1600 and E=94GPa.	CO5	7 Marks
		(OR)		
6	a)	Write the assumptions and limitations of Euler's formula.	CO1	7 Marks
	b)	A steel bar of rectangular section 38mm x 44mm fixed at each end is subjected to axial compression. The bar is 2.25m long. Determine the buckling load and the corresponding axial stress using Euler's formula. Determine the minimum length for which Euler's equation may be used to determine the buckling load, if the proportional limit of the material is 200 N/mm^2,Take E=2 x 10^5 N/mm^2.	CO5	7 Marks

UNIT-IV

7		A three span continues beam having fixed supports at the both ends and roller supports at the middle is having spans 10m, 8.5m and 12m carries a UDL of 8KN/m on span AB, two point loads of 35KN each at equal distances on span CD and a concentric moment of 6.5KN-m in the middle of span BC. Calculate support reactions and draw SFD, BMD.	CO6	14 Marks

(OR)

8		Draw the bending moment and shear force diagrams of a propped cantilever beam of span 8m subjected to UDL of 12 KN/m for the entire span and subjected to a point load 7KN at the propped end.	CO6	14 Marks

UNIT-V

9	a)	Explain about maximum principal stress theory and maximum principal strain theory in detail.	CO3	7 Marks
	b)	In a metallic body the principal stresses are +42MN/m² and -73 MN/m², the third principal stress being zero. The elastic stress in simple tension as well as in simple compression is equal and is 180 MN/m². Find the factor safety based on the elastic limit, if the criterion of the failure for the material is the maximum principal stress theory.	CO5	7 Marks

(OR)

10		A cantilever of a rectangular section 28mm wide and 46mm deep is subjected to an inclined load P at the free end. The inclination of the load is 44 degrees to the vertical. if the length of the cantilevers is 2.72m and the maximum stress due to bending is not to exceed 168MN/m², determine the value of P.	CO3	14 Marks

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations July – 2022

DESIGN OF MACHINE ELEMENTS-I
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What are the steps involved in the design of machine elements? Explain in detail.	CO1	8 Marks
	b)	Explain about preferred numbers and their significance.	CO1	6 Marks
		(OR)		
2	a)	Why factor of safety is necessary in the design of mechanical components? Discuss the important factors influencing the selection of factor of safety.	CO1	6 Marks
	b)	The load on a bolt consists of an axial pull of 10 kN together with a transverse shear force of 5 kN. Find the diameter of bolt required according to: i) Maximum principal stress theory. ii) Maximum shear stress theory. iii) Maximum strain energy theory. iv) Maximum distortion energy theory. Take permissible tensile stress at elastic limit = 100 MPa and Poisson's ratio = 0.3.	CO2	8 Marks

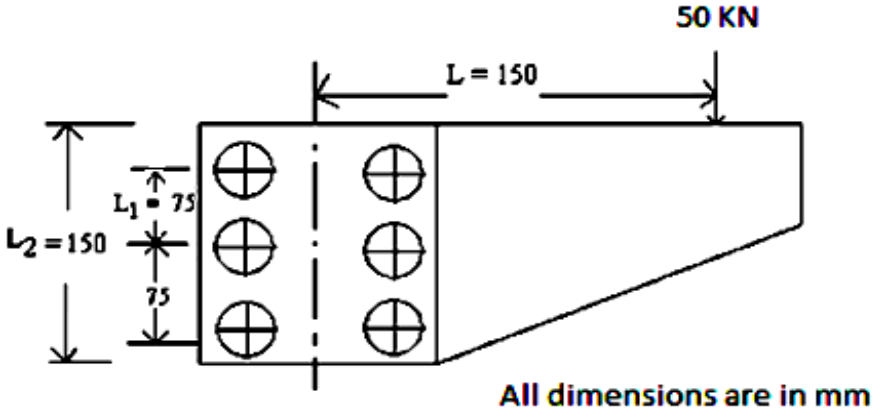
UNIT-II

3	a)	What is meant by endurance strength of a material? How does the size, surface condition of a component and type of load affect such strength?	CO1	6 Marks
	b)	A forged steel bar, 50 mm in diameter, is subjected to a reversed bending stress of 250 N/mm^2. The bar is made of steel 40C8 (σ_{ut} = 600 N/mm^2). The corrected endurance limit of the bar is 100 N/mm^2. Calculate the life of the bar for a reliability of 90%.	CO4	8 Marks
		(OR)		
4	a)	Explain about Soderberg and Goodman criterion for fatigue failure.	CO1	6 Marks
	b)	A machine component is subjected to fluctuating stress varies from 60 to 120 N/mm^2. The corrected endurance limit stress for the machine component is 280 N/mm^2. The ultimate tensile strength and yield strength of material are 600 and 450 N/mm^2 respectively. Find the factor of safety using i) Soderberg line. ii) Goodman line. Also, find the factor of safety against static failure.	CO2	8 Marks

UNIT-III

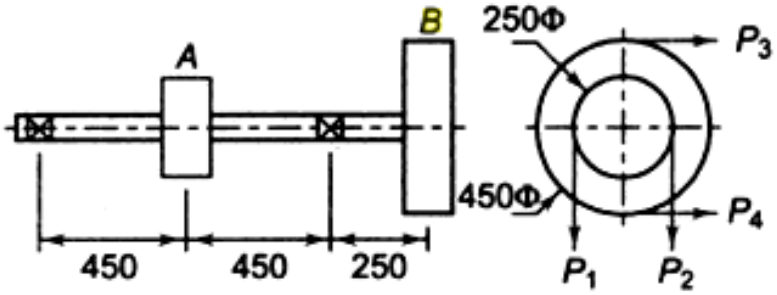
5	a)	What is an eccentric loaded welded joint? Discuss the procedure for designing such a joint.	CO1	8 Marks
	b)	Two steel plates 120 mm wide and 10 mm thick are joined by means of double transverse fillet welds. The maximum tensile stress for the plates and the welding materials should not exceed 110 N/mm^2. Find the required length of the weld, if the strength of the weld is equal to the strength of the plates.	CO4	6 Marks
		(OR)		

6 A bracket size as shown in figure is bolted to a column by 6 bolts of equal size. It carries a load of 50 kN at a distance of 150 mm from the centre of column. If the maximum stress in the bolts is to be limited to 150 MPa, determine the diameter of bolt. CO4 14 Marks



UNIT-IV

7 A line shaft supporting two pulleys A and B is shown in figure. Power is supplied to the shaft by means of a vertical belt on the pulley A, which is then transmitted to the pulley B carrying a horizontal belt. The ratio of belt tension on tight and loose sides is 3:1. The limiting value of tension in the belts is 2.7 kN. The shaft is made of plain carbon steel 40C8 (σ_{ut} = 650 N/mm^2 and σ_{yt} = 380 N/mm^2). The pulleys are keyed to the shaft. Determine the diameter of the shaft according to the ASME code if K_b = 1.5 and K_t = 1.0. CO6 14 Marks



(OR)

8 a) Discuss the design procedure for unprotected flange coupling with a neat sketch. CO3 8 Marks

b) Explain different types of keys with sketches and state their applications. CO1 6 Marks

UNIT-V

9 It is required to design a knuckle joint to connect circular shafts subjected to an axial force of 50 kN. The rods are coaxial and a small amount of angular movement between their axes is permissible. Design the joint and specify the dimensions of its components. The allowable tensile, compressive and shear stress in the rod and pin material is limited to 80 MPa, 100 MPa and 40 MPa respectively. CO3 14 Marks

(OR)

10 a) What is a cotter joint? State the applications of cotter joint. CO1 3 Marks

b) Describe in detail the design procedure of socket and spigot cotter joint. CO3 11 Marks

CODE No.:16BT40302 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations July – 2022

DYNAMICS OF MACHINERY
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

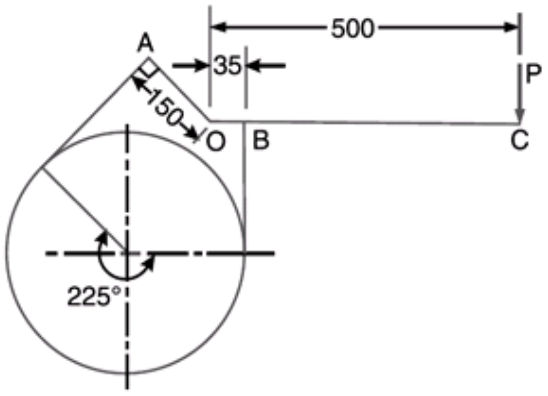
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Though cone clutches provide high frictional torque. Yet they have not obsolete. Why?	CO1	6 Marks
	b)	Describe with a neat sketch a centrifugal clutch and deduce an equation for the total torque transmitted.	CO2	8 Marks

(OR)

2	a)	What are various types of brakes, describe briefly?	CO1	6 Marks
	b)	A differential band brake, as shown in Figure 1 has an angle of contact of 225°. The band has a compressed woven lining and bears against a cast iron drum of 350mm diameter. The brake is to sustain a torque of 350 N-m and the coefficient of friction between the band and the drum is 0.3. Find : i) The necessary force (P) for the clockwise and anticlockwise rotation of the drum; and ii) The value of 'OA' for the brake to be self locking, when the drum rotates clockwise.	CO2	8 Marks



All dimensions in mm.

Figure 1

UNIT-II

3	a)	Define Gyroscopic Couple and explain the Effect of Gyroscopic Couple on an Aeroplane in each case with neat sketches.	CO1	7 Marks
	b)	An aeroplane flying at 240 km/hr turns towards the left and completes a quarter circle of 60 m radius. The mass of the rotary engine and the propeller of the plane is 450 kg with a radius of gyration of 320 mm. The engine speed is 2000 r.p.m clockwise when viewed from the rear. Determine the gyroscopic couple on the aircraft and state its effect. In what way is the effect changed when the: i) aeroplane turns towards right. ii) engine rotates clockwise when viewed from the front (nose end) and the aeroplane turns (i) leftand (ii) right .	CO3	7 Marks

(OR)

4	a)	What is the function of a flywheel? How does it differ from that of a governor?	CO1	4 Marks
	b)	The equation of the turning moment curve of a three crank engine is (5000+1500sin3θ) N-m, where θ is the crank angle in radians. The moment of inertia of the flywheel is 1000 kg-m² and the mean speed is 300 r.p.m. Calculate the maximum fluctuation of the speed of the flywheel in percentage when (i) the resisting torque is constant, and (ii) the resisting torque is (5000 + 600sinθ) N-m.	CO3	10 Marks

UNIT-III

5	a)	State and explain the following terms relating to governors : i) Stability ii) effort of a governor iii) Power of a governor. iv) Sensitiveness v) Isochronism and vi) Hunting.	CO1	6 Marks
	b)	A spring loaded governor of the Hartnell type has arms of equal length. The masses rotate in a circle of 130 mm diameter when the sleeve is in the mid position and the ball arms are vertical. The equilibrium speed for this position is 450 r.p.m., neglecting friction. The maximum sleeve movement is to be 25 mm and the maximum variation of speed taking in account the friction to be 5 per cent of the mid position speed. The mass of the sleeve is 4 kg and the friction may be considered equivalent to 30 N at the sleeve. The power of the governor must be sufficient to overcome the friction by one per cent change of speed either way at mid-position. Determine, neglecting obliquity effect of arms; i) The value of each rotating mass. ii) The spring stiffness in N/mm. iii) The initial compression of spring.	CO2	8 Marks

(OR)

6		The upper arms of a Porter governor has lengths 350 mm and are pivoted on the axis of rotation. The lower arms has lengths 300 mm and are attached to the sleeve at a distance of 40 mm from the axis. Each ball has a mass of 4 kg and mass on the sleeve is 45 kg. Determine the equilibrium speed for a radius of rotation of 200 mm and find also the effort and power of the governor for 1 per cent speed change.	CO2	14 Marks

UNIT-IV

7	a)	Describe the method of balancing of different masses revolving in the same plane.	CO1	4 Marks
	b)	A, B, C and D are four masses carried by a rotating shaft at radii 100, 125, 200 and 150 mm respectively. The planes in which the masses revolve are spaced 600 mm apart and the mass of B, C and D are 10 kg, 5 kg, and 4 kg respectively. Find the required mass A and the relative angular settings of the four masses so that the shaft shall be in complete balance.	CO4	10 Marks

(OR)

8	a)	What are in-line engines? How are they balanced? It is possible to balance them completely?	CO1	4 Marks
	b)	The reciprocating mass per cylinder in a 60° V-twin engine is 1.5 kg. The stroke and connecting rod length are 100 mm and 250 mm respectively. If the engine runs at 2500 r.p.m., determine the maximum and minimum values of the primary and secondary forces. Also find out the crank position corresponding these values.	CO4	10 Marks

UNIT-V

9 a) Derive the natural frequency of oscillation of the cylinder when it is displaced slightly from its equilibrium position in a circular surface of radius 'R'. The mass of cylinder is 'm' and radius 'r' is rolling without slipping in circular surface — CO1 — 7 Marks

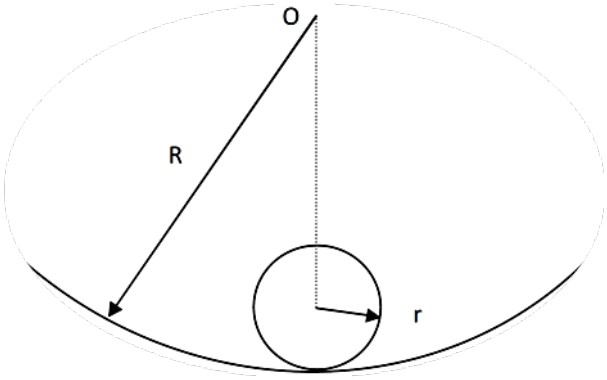


Figure-2

b) A machine having a mass of 100 Kg and supported on spring of total stiffness 7.84x105 N/m has an unbalanced rotating element which results in a disturbing force of 392 N at a speed of 3000 r.p.m. Assuming the damping factor as 0.2. Then determine: i) The amplitude of motion due to unbalance ii) Transmissibility and iii) the Transmitted force to the foundation. — CO5 — 7 Marks

(OR)

10 a) Define the terms transmissibility and vibration Isolation. — CO1 — 4 Marks

b) A torsional system is shown in figure 3. Find the frequencies of torsional vibrations and the positions of the nodes. Also find the amplitudes of vibrations. G=84 x 10^9 N/m² — CO5 — 10 Marks

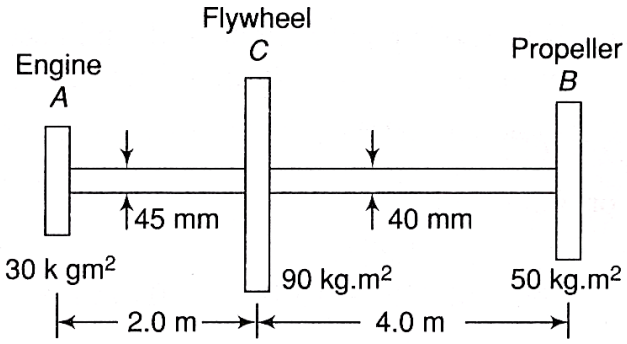


Figure.3

CODE No.:16BT40303 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations July – 2022

FLUID MECHANICS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	A Derive an expressions for capillary fall and rise.	CO1	7 Marks
	b)	The space between two square flat parallel plates is filled with oil. Each side of the plate is 60cm. The thickness of the oil film is 12.5mm. The upper plate, which moves at 2.5 meter per sec requires a force of 98.1N to maintain the speed. Determine: i) The dynamic viscosity of the oil in poise. ii) The kinematic viscosity of the oil in stokes if the specific gravity of the oil is 0.95.	CO2	7 Marks

(OR)

2		A Differential manometer is connected at the two points A and B of two pipes as shown in Fig (a). The pipe A contains a liquid of sp. gr. = 1.5 while pipe B containsa liquid of sp. gr. = 0.9. The pressures at A and B are 1 kgf/cm² and 1.80 kgf/cm² respectively. Find the difference in mercury level in the differential manometer.	CO4	14 Marks

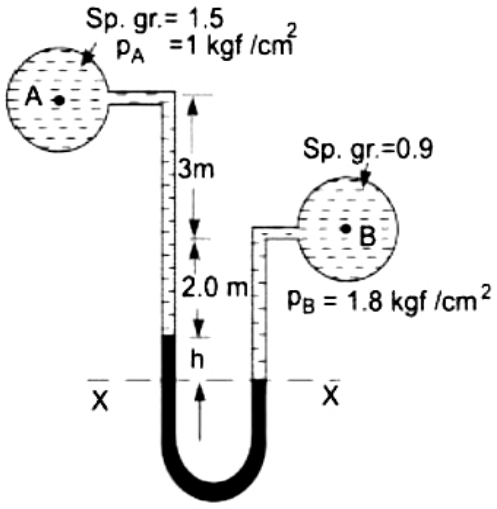


Fig. (a)

UNIT-II

3		What is an orificemeter? Derive an expression for the discharge through orificemeter.	CO3	14 Marks

(OR)

4		A 250 liters/s of water is flowing in a pipe having a diameter of 300 mm. If the pipe is bent by 135° (that is change from initial to find direction is 135°), find the magnitude and direction of the resultant force on the bend. The pressure of water flowing is 39.24 N/cm².	CO4	14 Marks

UNIT-III

5		Three pipes of 400mm, 300mm and 200mm diameters have lengths of 400m, 200m, and 300m respectively. They are connected in series to make a compound pipe. The ends of this compound pipe are connected with two tanks whose difference of water levels is 20m. If co-efficient of friction for these pipes is same and equal to 0.005, determine the discharge through the compound pipe neglecting first the minor losses and then including them.	CO3	14 Marks

(OR)

6		Derive an expression for the force and work done by the jet on unsymmetrical moving curved plate when jet strikes tangentially at one of its tip and also draw velocity triangles.	CO2	14 Marks

UNIT-IV

7	a)	Define the term 'Governing of a turbine'. Describe with a neat sketch the working of an oil pressure governor.	CO4	7 Marks
	b)	Derive an expression for the specific speed of a turbine.	CO6	7 Marks

(OR)

8		A pelton wheel is to be designed for the following specifications. Power = 735.75kw S.P.Head = 200m , Speed = 800 r.p.m, Overall efficiency = 0.86 and jet diameter is not exceed one-tenth the wheel diameter. Determine: i) Wheel diameter. ii) The number of jets required. iii) Diameter of the jet. Take C_v =0.98 and speed ratio=045.	CO5	14 Marks

UNIT-V

9		Derive an expression for the work done by an impeller of a centrifugal pump with sketch.	CO3	14 Marks

(OR)

10		What is a reciprocating pump? Describe the principle and working of a double acting reciprocating pump with neat sketch and also derive workdone/sec.	CO6	14 Marks

CODE No.:16BT40304 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations July – 2022

MACHINE TOOLS AND MODERN MACHINING PROCESSES
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Describe the nomenclature of single point cutting tool in ASA system.	CO6	7 Marks
	b)	What are the functions of a coolant?	CO6	7 Marks
		(OR)		
2	a)	Discuss the important cutting tool materials.	CO2	7 Marks
	b)	Derive the relation for shear plane angle from fundamentals.	CO4	7 Marks
		UNIT-II		
3	a)	Explain any seven important lathe operations briefly.	CO1	7 Marks
	b)	Describe the construction and working of capstan lathe.	CO1	7 Marks
		(OR)		
4	a)	Explain the principle of thread cutting in lathe.	CO1	7 Marks
	b)	Discuss about multi spindle automatic lathe and give its applications.	CO1	7 Marks
		UNIT-III		
5	a)	Give the classification of planning machines.	CO1	7 Marks
	b)	Explain the different operations that can be carried out on drilling machine.	CO1	7 Marks
		(OR)		
6	a)	Explain how machining time is calculated in shaper.	CO4	7 Marks
	b)	Explain the nomenclature of twist drill using a neat sketch.	CO3	7 Marks
		UNIT-IV		
7	a)	Explain the following terms of grinding wheel. i) Loading; ii) Glazing; iii) Turning; iv) Dressing.	CO1	7 Marks
	b)	Describe the principle of operation and main components of surface grinder.	CO1	7 Marks
		(OR)		
8	a)	Give the classification of milling machines in detail.	CO1	7 Marks
	b)	Explain any five important milling operations.	CO1	7 Marks
		UNIT-V		
9		Explain the principle of operation, applications and advantages of USM.	CO6	14 Marks
		(OR)		
10		Describe the Electron beam machining process in detail.	CO6	14 Marks

❀ ❀ ❀

CODE No.:16BT40401 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations July - 2022

ANALOG COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	The signal m(t) = 2cos(400πt) + sin(800πt) modulate a carrier 2 cos(2x10^{6}t). The modulation index is m=0.6. Find out the power in the carrier and sideband components of the modulated signal.	CO5	7 Marks
	b)	Explain the generation methods of DSBSC.	CO1	7 Marks
		(OR)		
2	a)	A SSB signal is generated by modulating an 800-kHz carrier by the signal m(t) = cos(2000πt) + 2sin(2000πt). The amplitude of the carriers Ac= 100. i) Determine the (time domain) expression for the lower sideband of the SSB AM signal ii) Determine the magnitude spectrum of the lower sideband SSB signal.	CO1	7 Marks
	b)	Derive the expression for time domain description of VSB Modulated wave.	CO1	7 Marks

UNIT-II

3	a)	Describe the spectral analysis of Frequency modulation. Compare the phasor diagram of narrow band FM signal and AM signal and discuss about the similarities and differences of the two signals.	CO5	7 Marks
	b)	With a neat sketch, explain the generation of FM wave using direct method.	CO1	7 Marks
		(OR)		
4	a)	A carrier at 200 MHz is frequency modulated by a sine wave signal at a frequency of 15 kHz. The peak carrier deviation is (±) 50 kHz. i) What is the value of the modulation index, m? ii) Approximately what total bandwidth is needed to transmit the signal.? iii) Draw a sketch to show the general idea of the spectrum of the FM sidebands for the modulated carrier. Indicate (and give a value for) the spacing between sidebands in frequency.	CO5	6 Marks
	b)	With the relevant expressions explain the demodulation of FM signals using frequency discrimination method.	CO1	8 Marks

UNIT-III

5	a)	In envelope detection, AM signal at the input to ED, has the modulation index 0.5 with the carrier amplitude of 2 V.m(t) is a tone signal of frequency 5 kHz and f_c >> 5kHz. If the (two-sided) noise PSD at the detector input is 10^{-8} watts/Hz, what is the expected $(SNR)_o$ of this scheme? By how many dB, this scheme is inferior to DSB-SC?	CO2	7 Marks
	b)	Derive the figure of merit of SSB.	CO2	7 Marks
		(OR)		
6	a)	Draw the FM receiver model and determine the SNR of the FM System.	CO2	9 Marks
	b)	With a neat phasor diagram, explain the threshold effect in AM system.	CO2	5 Marks

UNIT-IV

7	a)	Draw the block diagram of AM transmitter using low level modulation. Explain the significance of each block.	CO3	7 Marks
	b)	Explain the Tuned Radio Frequency (TRF) and also give the advantages and disadvantages of TRF receivers.	CO3	7 Marks

(OR)

8	a)	Draw the block diagrams of a super heterodyne receiver and explain the function of each block. With neat diagram, explain the general process of frequency changing in a super heterodyne receiver.	CO3	7 Marks
	b)	With a neat block diagram, explain FM receiver.	CO3	7 Marks

UNIT-V

9	a)	Explain the generation and detection of PAM and also give its applications.	CO1	8 Marks
	b)	Compare Digital pulse transmission as compared to analog transmission.	CO1	6 Marks

(OR)

10	a)	Compare PAM, PWM, PPM modulation schemes.	CO1	7 Marks
	b)	With a neat sketch, explain Time division multiplexing.	CO1	7 Marks

CODE No.:16BT40402 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations July – 2022

DIGITAL IC APPLICATIONS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Explain the following. i) Noise margin. ii) Transition time with respect to CMOS logic.	CO5	7 Marks
	b)	List out the characteristics of Emitter coupled logic.	CO5	7 Marks
		(OR)		
2	a)	Draw the CMOS Circuit for NAND gate with the help of function table.	CO1	8 Marks
	b)	Briefly list out the differences between ECL, TTL and CMOS logic family.	CO5	6 Marks
		UNIT-II		
3	a)	Define simulation. Explain about Gate level simulation and behavioral simulation.	CO4	7 Marks
	b)	Explain various types of delays in VHDL.	CO6	7 Marks
		(OR)		
4	a)	Explain the Operation of 74 x 138 decoder.	CO2	6 Marks
	b)	Explain the structure of various LOOP statements in VHDL, with examples.	CO4	8 Marks
		UNIT-III		
5	a)	Give the logic diagram of 74 x 139. Explain with the help of truth table using device design a 3to 8 decoder and provide the truth table.	CO2	8 Marks
	b)	Explain how a JK flip-flop can be constructed using a T flip- flop.	CO4	6 Marks
		(OR)		
6	a)	Develop a VHDL code for 2 x 4 demultiplexer of 74 x 139 IC.	CO3	6 Marks
	b)	Sketch the symbol and logic diagram of 74 x 280 IC.	CO2	8 Marks
		UNIT-IV		
7	a)	Explain about the logic behind Dual priority encoder.	CO1	6 Marks
	b)	Design a 4-bit LFSR counter using 74 x 194.List out the sequence that the initial state is 1110.	CO4	8 Marks
		(OR)		
8		Design and develop a verilog code for ring counter using 74 x 169 IC.	CO4	14 Marks
		UNIT-V		
9	a)	With a neat diagram, neatly explain about the internal structure of SRAM.	CO1	7 Marks
	b)	Write a short note on synchronous DRAM.	CO1	7 Marks
		(OR)		
10	a)	Mention any two applications of FPGA.	CO1	7 Marks
	b)	Distinguish between SRAM and ROM.	CO1	7 Marks

❀ ❀ ❀

CODE No.:16BT40403 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations July – 2022

ELECTROMAGNETIC THEORY AND TRANSMISSION LINES

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Deduce the conditions on *tangential* and *normal* components of E at a point on the surface of a conductor placed in free space, and hence show that the surface of a conductor is an *equipotential* surface.	CO1	7 Marks
	b)	A circular ring placed along $y^2 + z^2 = 4$, $x = 0$ carries a uniform charge of 5 μC/m. Calculate the electric flux density D at the point $P(3, 0, 0)$.	CO4	7 Marks
		(OR)		
2	a)	A uniform sheet of surface current K = K_y a_y is placed in $z = 0$ plane. Apply Ampere's circuital law to show that the magnetic field intensity H at any point (x, y, z) is 1/2 K x a_N, where a_N is the unit vector along the out ward normal direction to the sheet.	CO1	7 Marks
	b)	A conductor 4m long lies along the y – axis, with a current of 10 Amp, a_y indirection. Find the force on the conductor if the field in the region is B=0.05 web/m^2.	CO4	7 Marks

UNIT-II

3	a)	Verify whether the fields, E = 2 sin(x) sin(t) a_y V/m and H = $\frac{2}{\mu_0}$ cos(x) cos(t) a_z A/m, satisfy the Maxwell's equations in free space.	CO1	7 Marks
	b)	Derive the Maxwell's equations in integral form, from differential form for static fields, and describe the physical meaning of integral forms.	CO2	7 Marks
		(OR)		
4	a)	The region *1*, defined by $x < 0$, is free space while region *2*, $x > 0$ is a dielectric material for which $\epsilon_{r2} = 2.4$. If $D_1 = 3a_x - 4a_y + 6a_z$ C/m^2, calculate the direction and magnitude of E_2.	CO2	7 Marks
	b)	Derive *equation of continuity* for time varying fields.	CO1	7 Marks

UNIT-III

5	a)	Obtain the condition required to separate good conductors from good dielectrics, and derive the propagation characteristics of a uniform plane wave propagating in a good dielectric medium.	CO5	7 Marks
	b)	Obtain the relation between E and H fields of a uniform plane wave, and show that the direction of E x H is along the direction of propagation of the wave.	CO6	7 Marks
		(OR)		
6	a)	Derive the wave equations for E and H in conducting medium and express the wave equations in phasor notation.	CO5	7 Marks
	b)	Derive the expressions for α, β, v_p and η for the wave propagating in a good conducting medium and hence deduce the expression for skin depth δ.	CO6	7 Marks

UNIT-IV

7	a)	Develop the differential equations governing the voltage and current at a point on a uniform transmission line.	CO3	7 Marks
	b)	Prove that a line of finite length terminated by its characteristic impedance Zo is equivalent to a line of an infinite length.	CO2	7 Marks

(OR)

8	a)	An open wire telephone line has R=10 ohm/km, L=0.0037 H/km, C=0.0083 x 10^{-6} F/km and G=0.4 x 10^{-6} mhos/km. Determine its Z_o, α, and β at 1000 Hz.	CO3	7 Marks
	b)	Discus the significance of attenuation and Phase shift constants.	CO2	7 Marks

UNIT-V

9	a)	Discuss the significance of λ/4 and λ/8 lines.	CO1	7 Marks
	b)	Discuss mathematically the formation of standing waves on a dissipation less line and hence compare the formation of nodes and antinodes in open and short circuit lines.	CO4	7 Marks

(OR)

10	a)	A lossless transmission line in air having a characteristic impedance of 300Ω is terminated in unknown impedance .The first voltage minimum is located at 15 cm from the load. The standing wave ratio is 3.3. Calculate the wavelength and terminated impedance.	CO1	7 Marks
	b)	A 75Ω lossless transmission line is to be matched with a 100+j80Ω load using single stub. Calculate the stub length and its distance from the load corresponding to the frequency of 30MHz using smith chart.	CO4	7 Marks

CODE No.:16BT40404 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations July – 2022

LINEAR IC APPLICATIONS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain about DC and AC analysis of Dual input and Balanced Output Configuration of Differential Amplifier.	CO2	7 Marks
	b)	Elaborate the significance of CMRR in the differential amplifier and give methods for improving this factor.	CO2	7 Marks
		(OR)		
2	a)	Explain the AC Characteristics of Op-Amp.	CO2	7 Marks
	b)	Calculate the operating points of the differential amplifier with R_C = 3.9 Kohms, R_E=3.3 Kohms, V_{CC} = 9V and $-V_{EE}$ = -9V.	CO2	7 Marks

UNIT-II

3	a)	Explain about log and anti - log Amplifiers.	CO3	7 Marks
	b)	Explain the operation of Triangular wave Generator circuit.	CO3	7 Marks
		(OR)		
4	a)	Discuss the characteristics and limitations of op amp comparator and give basic differences between comparator and Schmitt trigger.	CO3	7 Marks
	b)	Describe the operation of Monostable Multivibrator using 741.	CO3	7 Marks

UNIT-III

5	a)	Write a short note on differences between fixed and adjustable voltage regulators.	CO4	7 Marks
	b)	Explain about 723 General Purpose regulators.	CO4	7 Marks
		(OR)		
6	a)	Derive the cut-off frequencies for Low Pass Filter, High Pass Filter of First order.	CO4	7 Marks
	b)	Design a Band rejection filter with F_L=150Hz, F_h=10KHz. Assume the A_v=2. And also calculate Q.	CO4	7 Marks

UNIT-IV

7	a)	Explain the operation of Astable Mode of 555 and derive the expression of Duty cycle.	CO5	7 Marks
	b)	Write a short note Application of Monostable multivibrator.	CO5	7 Marks
		(OR)		
8	a)	Mention the importance VCO and derive the expression for frequency.	CO5	7 Marks
	b)	Design 555 timer for a square wave generator with 50% duty cycle.	CO5	7 Marks

UNIT-V

9	a)	Explain about binary weighted DAC and calculate resolution for a 3 bit DAC with 5v as Vo.	CO1	7 Marks
	b)	Write about the specifications of DAC and calculate Vo for 4bit DAC with resolution of 0.15v.	CO1	7 Marks
		(OR)		
10	a)	Elaborate the functioning of a Flash A/D converter.	CO1	7 Marks
	b)	Elaborate the concept of Monolithic DAC.	CO1	7 Marks

❀ ❀ ❀

CODE No.:16BT40405 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations July - 2022

PROBABILITY AND STOCHASTIC PROCESS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) If a mass function is given by CO1 8 Marks

$$P(x) = \begin{cases} Ax & ; x = 1,2,.....50 \\ A(100 - x) & ; x = 51,52....100 \\ 0 & ; \text{otherwise} \end{cases}$$

i) Find A that makes the function a p.m.f and sketch its graph.
ii) Find $P(x > 50)$, $P(x < 50)$, $P(25 < x < 75)$ and $P(x$ – as odd number)
iii) (*a*) If the events indicated in (*b*) are *A,B,C,D* respectively find $P(A/B)$; $P(A/C)$; $P(A/D)$;$P(C/D)$.

b) State and prove Total probability and Bayes' theorem CO1 6 Marks

(OR)

2 a) A company producing electric relays has three manufacturing plants producing 50, 30 and 20 percent respectively of its product. Suppose the probabilities that a relay manufactured by these plants is defective are 0.02, 0.05 and 0.01 respectively. CO1 7 Marks

i) If a relay is selected at random from the output of the company, what is the probability that it is defective?
ii) If a relay selected at random is found to be defective, what is the probability that it was manufactured by plant 2?

b) Let two honest coins, marked 1 and 2, be tossed together. The four possible outcomes are *T*1*T*2, *T*1*H*2, *H*1*T*2, *H*1*H*2. (*T*1 indicates toss of coin 1resulting in tails; similarly *T*2 etc.) We shall treat that all these outcomes are equally likely; that is the probability of occurrence of any of these four outcomes is 1/4. (Treating each of these outcomes as an event, we find that these events are mutually exclusive and exhaustive). Let the event *A* be 'not *H*1*H*2 ' and *B* be the event 'match'. (Match comprises the two outcomes *T*1*T*2, *H*1*H*2). Find $P(B|A)$. Are *A* and *B* independent. CO1 7 Marks

UNIT-II

3 a) $Y = g(X) = X + a$, where '*a*' is a constant. Let us find $f_Y(y)$. CO2 7 Marks

b) The CDF of the random variable *X* is given by CO1 7 Marks

$$F_X(x) = \begin{cases} 0 & x < 0 \\ x + \frac{1}{2} & 0 \le x \le \frac{1}{2} \\ 1 & x > \frac{1}{2} \end{cases}$$

i) Draw the graph of the CDF.
ii) Compute P(X > ¼).

(OR)

4 Find the expected value and variance of the random variable *K* the following **pmf** . CO2 14 Marks

$$pk(k) = \frac{\lambda^k}{k!} e^{-\lambda} \qquad k = 0, 1, 2,....$$

UNIT-III

5	a)	Given two random variables X and Y with the joint CDF$FXY(x, y)$ and marginal CDFs $FX(x)$ and $FY(y)$, respectively, compute the joint probability that X is greater than a and Y is greater than b.	CO2	6 Marks
	b)	The joint PMF of two random variables X and Y is given by where k is a constant. $$PXY(x,y) = \begin{cases} k(2x+y) & x = 1,2; y = 1,2 \\ 0 & otherwise \end{cases}$$ i) What is the value of k? ii) Find the marginal PMFs of X and Y. iii) Are X and Y independent?	CO2	8 Marks

(OR)

6	a)	The joint PDF of the random variables X and Y is defined as follows: $$f_{XY}(x,y) = \begin{cases} 25e^{-5y} & 0 < x < 0.2, y > 0 \\ 0 & otherwise \end{cases}$$ i) Find the marginal PDFs of X and Y. ii) What is the covariance of X and Y?	CO2	7 Marks
	b)	State and prove central limit theorem.	CO1	7 Marks

UNIT-IV

7	a)	A random process has sample functions of the form $X(t) = A\cos(wt+\Theta)$ where w is constant, A is a random variable that has a magnitude of +1 and −1with equal probability, and _ is a random variable that is uniformly distributed between 0 and 2π. Assume that the random variables A and _ are independent.	CO3	7 Marks
	b)	State and prove the properties of cross correlation.	CO3	7 Marks

(OR)

8	a)	A random process has the autocorrelation function $R_{XY}(\tau) = \frac{4\tau^2 + 6}{\tau^2 + 1}$. Find the mean-square value, the mean value and the variance of the process.	CO3	7 Marks
	b)	Two random processes $X(t)$ and $Y(t)$ are defined as follows: $X(t) = A\cos(wt + \Theta)$ $Y(t) = B\sin(wt + \Theta)$ Where A, B, and w are constants and _ is a random variable that is uniformly distributed between 0 and 2_. Find the cross correlation function of $X(t)$ and $Y(t)$.	CO3	7 Marks

UNIT-V

9	a)	Obtain the expression for noise figure in terms of equivalent noise temperature for an amplifier.	CO3	7 Marks
	b)	Explain Shot noise, thermal noise.	CO1	7 Marks

(OR)

10	a)	Derive the expression for thermal noise voltage.	CO3	7 Marks
	b)	Classify noise and explain.	CO1	7 Marks

❀ ❀ ❀

CODE No.:16BT40406 SVEC16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC16) Supplementary Examinations July - 2022

PULSE AND DIGITAL CIRCUITS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

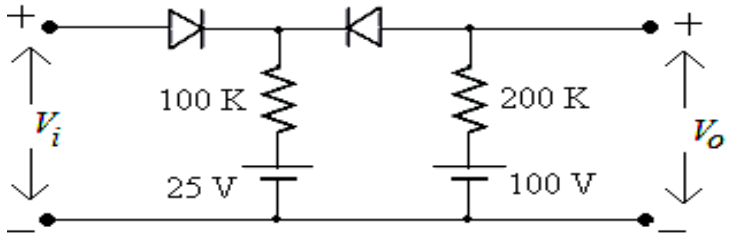
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain in detail about Ringing Circuit with a neat sketch.	CO1	6 Marks
	b)	Justify why sinusoidal signals are not suitable for linear wave shaping.	CO2	8 Marks
		(OR)		
2.	a)	Explain in detail about attenuators.	CO1	7 Marks
	b)	Describe how a Compensated Attenuator improves the unsatisfactory response of a simple Attenuator.	CO2	7 Marks

UNIT-II

3.	a)	For the circuit shown in figure an input voltage V_i linearly from 0 to 150V is applied. Sketch the output waveform V_0 to the same time scale. Assume ideal diodes.	CO3	8 Marks



	b)	What is meant by a **dc** restoration circuit and explain?	CO1	6 Marks
		(OR)		
4.	a)	Considering a practical clamping circuit, Asses the generation of spikes with tilt in the forward and in the reverse directions.	CO6	6 Marks
	b)	Discuss in detail about Diode Comparator with neat sketches.	CO1	8 Marks

UNIT-III

5.	a)	Calculate pulse width period and frequency of output of an astablemultivibrator, if $R_1 = R_2 = 10K\Omega$ and $C_1 = C_2 = 0.01\mu F$.	CO4	6 Marks
	b)	Classify Multivibrators and explain the types of triggering.	CO1	8 Marks
		(OR)		
6.	a)	Derive the expressions for UTP and LTP for Schmitt trigger circuit with equivalent circuit diagrams and waveforms.	CO2	8 Marks
	b)	Find the ratio V_{CC}/V, if a voltage-to-frequency converter generates oscillations of frequency twice of that when $V=V_{CC}$.	CO5	6 Marks

UNIT-IV

7.	a)	How to apply Miller principle to generate sweep voltage?	CO5	7 Marks
	b)	What is linearity correction through adjustment of driving waveform?	CO4	7 Marks
		(OR)		
8.	a)	Derive the expression for slope error in Bootstrap sweep circuit.	CO2	7 Marks
	b)	Identify appropriate circuit to generate linear Sweep waveform which can be used in Cathode ray oscilloscope.	CO6	7 Marks

UNIT-V

9.	a)	Draw the circuit diagram of Diode-transistor logic NAND gate and explain its operation.	CO1	6 Marks
	b)	Realize OR gate using diodes and transistors.	CO2	8 Marks
		(OR)		
10.	a)	What are the applications of sampling gates?	CO1	7 Marks
	b)	Draw the circuit diagram of CMOS NAND gate and explain its operation.	CO1	7 Marks

CODE No.:16BT40502 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations July – 2022

DATABASE MANAGEMENT SYSTEMS
[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the purpose of database system. What are the advantages of it.	CO1	8 Marks
	b)	Draw and Explain the three level architecture of database system.	CO1	6 Marks
		(OR)		
2	a)	Compare the specialization and generalization.	CO2	6 Marks
	b)	With an example describe various attributes used in ER Model.	CO2	8 Marks

UNIT-II

3	a)	Discuss in detail about various concepts used in ER-model.	CO2	6 Marks
	b)	What is a view? How views are implemented?	CO2	8 Marks
		(OR)		
4	a)	Differentiate Relational Algebra, Relational Calculus and SQL.	CO1	6 Marks
	b)	Differentiate Tuple Relational Calculus and Domain Relational Calculus.	CO2	8 Marks

UNIT-III

5	a)	Write the basic structure of SQL. Explain about the data types used in SQL.	CO1	8 Marks
	b)	What is a group function? List and explain how to use group functions in SQL with appropriate examples.	CO5	6 Marks
		(OR)		
6	a)	Why the functional dependency is needed? Write Armstrong inference rules of functional dependencies.	CO2	6 Marks
	b)	Explain in detail about various normal forms with examples.	CO2	8 Marks

UNIT-IV

7	a)	Describe the properties of a transaction. Explain about transaction states with a neat sketch.	CO2	8 Marks
	b)	Explain in detail about Serializability and Recoverability used in scheduling of transactions.	CO2	6 Marks
		(OR)		
8	a)	What is a time-stamp? Write and explain the steps of basic time-stamp ordering protocol.	CO3	7 Marks
	b)	Explain validation concurrency control mechanism.	CO1	7 Marks

UNIT-V

9	a)	What is an index structure? Explain how to use hash table as an index structure for a database.	CO1	8 Marks
	b)	When does a collision occur in hashing? Illustrate various collision resolution techniques.	CO3	6 Marks
		(OR)		
10	a)	Discuss in detail about B tree index files.	CO1	7 Marks
	b)	Explain B+ tree implementation with examples. Explain its advantages over B tree.	CO2	7 Marks

❀ ❀ ❀

CODE No.:16BT41001 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations July – 2022

INDUSTRIAL INSTRUMENTATION - I
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1		Explain with figures how to measure force with different load cells.	CO1	14 Marks
		(OR)		
2	a)	Explain how to measure the torque with load cell method.	CO1	6 Marks
	b)	What is significance of stain gauge to measure the torque?	CO2	8 Marks
		UNIT-II		
3	a)	Draw and explain variable reluctance type accelerometer.	CO2	8 Marks
	b)	With a neat diagram, explain the construction and working of stroboscope.	CO1	6 Marks
		(OR)		
4	a)	Explain how to measure the velocity with tachometer.	CO4	6 Marks
	b)	Write a short note on Gyroscope.	CO1	8 Marks
		UNIT-III		
5	a)	Explain about elastic transducers.	CO1	7 Marks
	b)	With a neat diagram, explain the construction and working of capacitive transducer.	CO3	7 Marks
		(OR)		
6	a)	Explain about sound level meter.	CO1	7 Marks
	b)	What is the need of mono meter? Explain the types.	CO2	7 Marks
		UNIT-IV		
7	a)	Explain in detail about RTD and its characteristics.	CO1	7 Marks
	b)	What is the difference between 3 lead methods and 4 lead methods?	CO3	7 Marks
		(OR)		
8	a)	What is thermistor? Explain types.	CO1	8 Marks
	b)	Explain thermo couple junctions and different types of reference junctions used.	CO4	6 Marks
		UNIT-V		
9	a)	Explain a suitable method to measure the radiation.	CO3	7 Marks
	b)	Explain construction and working Johnson noise thermometer.	CO2	7 Marks
		(OR)		
10	a)	Explain in detail about thermography.	CO3	8 Marks
	b)	Write short note on Pyrometric cones.	CO1	6 Marks

❀ ❀ ❀

CODE No.:16BT41002 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations July - 2022

LINEAR AND DIGITAL ICS

[Electrical and Electronics Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the concept of level translator in detail.	CO1	6 Marks
	b)	With suitable diagrams, neatly explain about the compensation techniques used for non ideal DC characteristics of an Op-Amp.	CO1	8 Marks
		(OR)		
2	a)	Discuss briefly about external frequency compensation techniques of an Op-Amp.	CO2	8 Marks
	b)	For an OP-AMP, PSRR is 70dB, CMRR is 10^5, and differential mode gain is 10^5. The Output voltage changes by 10V in 2 μsec. Calculate: i) Numerical value of PSRR. ii) Common mode gain. iii) Slew rate.	CO4	6 Marks

UNIT-II

3	a)	List out the limitations of Op-Amp as a comparator.	CO3	7 Marks
	b)	Draw the frequency response curve of a differentiator. How is it modified when a small resistor is connected in series with the capacitor?	CO2	7 Marks
		(OR)		
4	a)	What are the features of an instrumentation amplifier?	CO1	6 Marks
	b)	Explain the operation of the instrumentation amplifier using a transducer bridge. Also derive an expression for output voltage.	CO1	8 Marks

UNIT-III

5	a)	What do you mean by sampling? Explain the basic circuit for sample and Hold circuit.	CO1	8 Marks
	b)	Design a 555 Astable multivibrator to operate at 10 kHz with 70% duty cycle.	CO4	6 Marks
		(OR)		
6	a)	Draw the circuit diagram of PLL AM detector and explain its operation.	CO2	6 Marks
	b)	Derive an expression for frequency of oscillations of RC Phase Shift Oscillator using an Op-Amp.	CO2	8 Marks

UNIT-IV

7	a)	List out different logic families of CMOS logic and explain each one in detail.	CO1	6 Marks
	b)	Explain how different levels of digital circuit modeling can be done using HDL.	CO5	8 Marks
		(OR)		
8	a)	Explain the concept of CMOS dynamic electrical behavior in detail.	CO1	6 Marks
	b)	What are the different objects and data types available in HDL? Explain.	CO1	8 Marks

UNIT-V

9	a)	Explain the operation of 74 x 163 IC using state table.	CO2	7 Marks
	b)	Distinguish between the synchronous and asynchronous counters in detail.	CO2	7 Marks
		(OR)		
10	a)	Design a 32 to 1 multiplexer using four 74 x 151 multiplexers and 74 x 139 decoder.	CO2	7 Marks
	b)	Design a conversion circuit to convert T flip flop to JK flip flop.	CO3	7 Marks

❀ ❀ ❀

CODE No.:16BT41041 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations July – 2022

COMPUTER ARCHITECTURE AND ORGANIZATION
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Draw and explain the different types of 8085 microprocessor.	CO1	7 Marks
	b)	Explain the different types of buses in 8085 microprocessor.	CO1	7 Marks
		(OR)		
2	a)	Describe the structure of SRAM cell.	CO3	4 Marks
	b)	Explain various mapping techniques associated with cache memories.	CO3	10 Marks

UNIT-II

3		Draw and explain the 8085 architecture.	CO1	14 Marks
		(OR)		
4		Explain 8085 arithmetic and logical instructions with suitable examples.	CO2	14 Marks

UNIT-III

5	a)	Write the need for addressing modes. Explain various addressing modes supported by a general purpose CPU.	CO1	7 Marks
	b)	Differentiate between various interrupts.	CO1	7 Marks
		(OR)		
6	a)	Write an 8085 program to arrange an array of data in ascending order.	CO3	7 Marks
	b)	Explain the need for an input interface.	CO4	7 Marks

UNIT-IV

7		Design a bus system for four registers using multiplexers.	CO3	14 Marks
		(OR)		
8	a)	Design a 4 bit sequential circuit for shifting bits to the left or to the right.	CO3	6 Marks
	b)	Differentiate between RISC and CISC processors.	CO2	8 Marks

UNIT-V

9		Develop an algorithm to perform multiplication operation with an example.	CO5	14 Marks
		(OR)		
10		Illustrate with an example an instruction pipeline.	CO1	14 Marks

❀ ❀ ❀

CODE No.:16BT41201 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations July – 2022

DESIGN AND ANALYSIS OF ALGORITHMS
[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

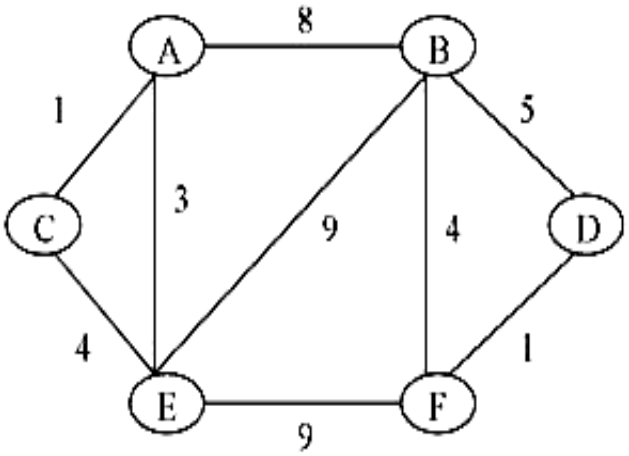
1	a)	Define algorithm. Describe the criteria to be satisfied by an algorithm.	CO1	5 Marks
	b)	Write notes on asymptotic notations of algorithms.	CO1	9 Marks
		(OR)		
2		Present both recursive and iterative algorithms that compute factorial of a number. Also, determine the time complexities using step count method.	CO2, CO3	14 Marks

UNIT-II

3	a)	Present and describe the simple union and weighted union algorithms for disjoint sets.	CO2	8 Marks
	b)	Illustrate DFS algorithm.	CO1	6 Marks
		(OR)		
4		Write short notes on the following: i) Find operation of disjoint sets. ii) Connected components. iii) Spanning Tree.	CO1	14 Marks

UNIT-III

5	a)	Elucidate Quick Sort algorithm.	CO1, CO4	8 Marks
	b)	Derive the best case, average case and worst case time complexities of quick sort using substitution method.	CO2	6 Marks
		(OR)		
6	a)	Find the Minimum Cost Spanning tree of the following graph using greedy approach.	CO1	7 Marks



	b)	State Job sequencing with deadlines problem. Illustrate how to solve it using greedy approach.	CO1	7 Marks

UNIT-IV

7		What is an Optimal Binary Search Tree? By means of an example, describe how to construct it.	CO1	14 Marks

(OR)

8	a)	By considering appropriate example, illustrate the dynamic programming solution of matrix chain multiplication problem.	CO1	7 Marks
	b)	Present and explain the algorithm that finds Hamiltonian cycles in a given graph.	CO1, CO3	7 Marks

UNIT-V

9	a)	Discuss various methodologies of Branch and Bound technique.	CO1	7 Marks
	b)	Explain how the travelling salesperson problem is solved by using FIFO Branch and Bound.	CO1	7 Marks

(OR)

10		Solve the following knapsack instance using Least Cost Branch and Bound: $n = 5$, $(p1, p2, ..., p5) = (10, 15, 6, 8, 4)$, $(w1, w2, ..., w5) = (4, 6, 3, 4, 2)$, and $m = 12$.	CO1	14 Marks

CODE No.:16BT41202 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations July - 2022

JAVA PROGRAMMING

[Computer Science and Engineering, Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	List and explain the java buzzwords	CO1	5 Marks
	b)	Explain iteration statements in java with examples	CO1	5 Marks
	c)	What is the difference between class and interface?	CO2	4 Marks
		(OR)		
2	a)	Explain method overloading with example.	CO2	7 Marks
	b)	Explain about final classes, final methods and final variables.	CO2	7 Marks

UNIT-II

3	a)	Explain about the abstract class with example.	CO1	7 Marks
	b)	Explain the importance of inheritance with the help of an example.	CO3	7 Marks
		(OR)		
4	a)	What is interface? Write a program to demonstrate how interfaces can be executed.	CO2	8 Marks
	b)	Explain about user defined packages and write a java program to create a user defined packages.	CO1	6 Marks

UNIT-III

5	a)	Create a try block that is likely to generate three types of exception and incorporate necessary catch blocks to catch and handle them.	CO2	7 Marks
	b)	List out various built-in exception handlers.	CO2	7 Marks
		(OR)		
6	a)	Explain how threads with different priorities execute in environment which supports priorities and which doesn't support priorities.	CO2	5 Marks
	b)	What are the functions available in java related to priority?	CO2	5 Marks
	c)	Develop a java program for producer consumer problem to illustrate the concept of multithreading?	CO3	4 Marks

UNIT-IV

7	a)	What is java collections framework? List out some benefits of collections framework.	CO1	7 Marks
	b)	Explain ArrayList and HashSet standard collection classes with an example.	CO1	7 Marks
		(OR)		
8	a)	Draw an Applet life cycle diagram and explain the methods in it.	CO4	8 Marks
	b)	Develop a java Applet program to explain parameter passing technique with an example.	CO4	6 Marks

UNIT-V

9	a)	What are the methods supported by KeyListener interface and MouseListener interface. Explain each of them with examples?	CO4	7 Marks
	b)	Explain the mechanism of event delegation model. Give an example for using keyboard event.	CO5	7 Marks
		(OR)		
10	a)	What is servlet? Explain servlet life cycle methods.	CO5	8 Marks
	b)	Develop a servlet application to validate user login details using HTTPServlet (name and password)	CO6	6 Marks

CODE No.:16BT41204 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations July - 2022

THEORY OF COMPUTATION

[Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Prove that a language L is accepted by some €-NFA if and only if L is accepted by some DFA.	CO1	7 Marks
	b)	Compute the €-closure of each state for the given NFA with € transitions and convert it to DFA.	CO5	7 Marks

δ	€	a	b
→ p	{r}	{q}	{p, r}
q	Φ	{p}	Φ
*r	{p, q}	{r}	{p}

(OR)

2	a)	Design a Mealy machine which counts the occurrence of substring '*aab*' in a given input string.	CO3	7 Marks
	b)	Design a DFA to accept odd number of a's and even number of b's, where Σ={a,b}. Show the acceptance of a string with an example	CO3	7 Marks

UNIT-II

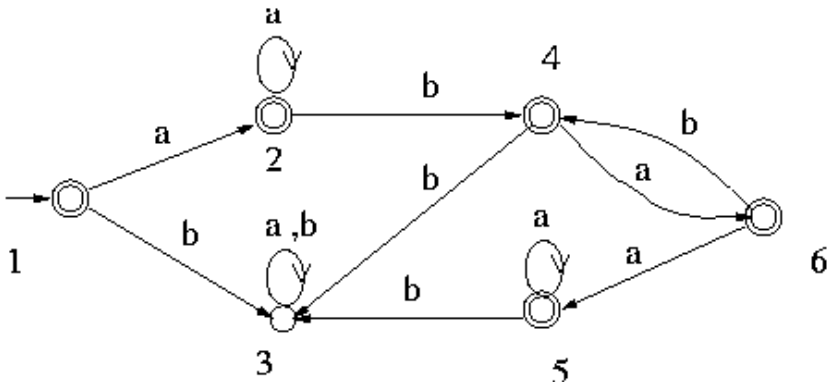
3	a)	Apply State Elimination Technique to convert the following DFA to a regular expression.	CO5	8 Marks

δ	0	1
→* *p*	s	p
q	p	s
r	r	q
s	q	r

	b)	List and explain the closure properties of regular languages.	CO1	6 Marks

(OR)

4	a)	Construct a DFA that accepts all strings corresponding to the regular expression 1*01(0 + 11)*.	CO3	6 Marks
	b)	Minimize the following automata.	CO5	8 Marks



UNIT-III

5	a)	Convert the following grammar into GNF. $S \rightarrow AA \mid a$ $A \rightarrow SS \mid b$	CO3	10 Marks
	b)	Remove useless symbol from the given grammar. $S \rightarrow aAa$ $A \rightarrow bBB$ $B \rightarrow ab$ $C \rightarrow aB.$	CO3	4 Marks

(OR)

6	a)	Construct context –free grammar for the following language $L = \{a^n b^m c^m d^n \mid m, n \geq 1\}$.	CO3	7 Marks
	b)	Prove that the following grammar is ambiguous $S \rightarrow a \mid abSb \mid aAb$ $A \rightarrow bS \mid aAAb$	CO3	7 Marks

UNIT-IV

7	a)	Construct a PDA that recognizes the language $L = \{a^m cb^m \mid m \geq 1\}$ by empty stack and final state.	CO3	10 Marks
	b)	Analyze the PDA acceptance method "From empty Stack to final state"	CO2	4 Marks

(OR)

8	a)	Construct an equivalent PDA for the language Context Free Grammar $S \rightarrow aAB \mid bBA$ $A \rightarrow bS \mid a$ $B \rightarrow aS \mid b$ Show an ID for the string '*abbaaabbbbab*' for the PDA generated with stack description.	CO3	12 Marks
	b)	Define the instantaneous description of a PDA.	CO1	2 Marks

UNIT-V

9	a)	Design a Turing Machine M to implement the function 'Addition' using the subroutine 'copy'.	CO4	10 Marks
	b)	What are Universal Turing Machines?	CO1	4 Marks

(OR)

10	a)	With a neat sketch, explain Turing Machines with semi-infinite tapes.	CO1	4 Marks
	b)	Design a Turing Machine over $\Sigma = \{a, b, c\}$ to accept the language $L=\{a^n b^n c^n \mid n > 0\}$.	CO6	10 Marks

CODE No.:16BT3HS01 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

ENVIRONMENTAL STUDIES

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What are the objectives and guiding principles of environmental studies?	CO1	7 Marks
	b)	Analyze the various types of land degradation with its causes and solutions.	CO2	7 Marks
		(OR)		
2	a)	Analyze the environmental impact of deforestation.	CO2	7 Marks
	b)	What are the world's food problems and what can we do help solve the world's food problems?	CO3	7 Marks

UNIT-II

3	a)	Analysis the impacts do human activities have on population communities and ecosystem.	CO2	7 Marks
	b)	What are the mega biodiversity centers in the world and hotspots in India?	CO1	7 Marks
		(OR)		
4		Analysis an aquarium as an eco system. Identify the major abiotic and biotic factors. List the members of the producer, primary consumer, secondary consumer and decomposer tropic levels.	CO2	14 Marks

UNIT-III

5	a)	List the five primary and secondary air pollutants and commonly released into the atmosphere and their sources.	CO1	7 Marks
	b)	How is water pollution related to agricultural activities? Why is this growing concern?	CO5	7 Marks
		(OR)		
6	a)	How do you measure noise? What are its?	CO1	3 Marks
	b)	What is frequency and magnitude of noise?	CO1	7 Marks
	c)	What are the various noise controlling measures?	CO1	4 Marks

UNIT-IV

7		Give a case study of Environmental sustainable development.	CO9	14 Marks
		(OR)		
8	a)	How the problems can be solved related to global warming?	CO4	4 Marks
	b)	Discuss the constitution, duties and powers the wild life advisory board under the provisions of the wild life protection Act 1972	CO8	10 Marks

UNIT-V

9	a)	State the impact behind the increased population growth in the less developed nations compared with developed nations noticed.	CO2	7 Marks
	b)	Explain the role of information technology in human health.	CO1	7 Marks
		(OR)		
10		Write a report based on the visit in an industrial area.	CO9	14 Marks

❀ ❀ ❀

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

ELECTRONIC CIRCUIT ANALYSIS AND DESIGN

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Draw the circuit of CC amplifier and explain its working using h-model approximation analysis.	CO2	7 Marks
	b)	Explain the operation of CB amplifier.	CO3	7 Marks
		(OR)		
2	a)	Differentiate different types of coupling schemes in multistage amplifiers.	CO2	5 Marks
	b)	Derive the expression for voltage gain of a two-stage RC coupled CE amplifier at mid frequency range.	CO4	9 Marks

UNIT-II

3	a)	Derive the expression for A_v, R_i, R_o of common drain amplifier at high frequencies.	CO3	8 Marks
	b)	Draw the hybrid π model and explain $\mathbf{g_m}$ and $\mathbf{r_{b'e}}$.	CO4	6 Marks
		(OR)		
4	a)	Derive the expression for CE current gain with resistive load.	CO3	8 Marks
	b)	Short circuit current gain of a transistor is 25 at a frequency of 2MHz. If f_β = 200kHz, calculate: i) $\mathbf{f_T}$. ii) hfe. iii) |Ai| at a frequency of10MHz. iv) |Ai| at a frequency of 100MHz.	CO4	6 Marks

UNIT-III

5	a)	Enumerate the effects of negative feedback on the various characteristics of the amplifier with suitable derivations.	CO5	9 Marks
	b)	An amplifier has a voltage gain of 200, before negative feedback is applied. When negative feedback is applied, the nominal gain changes by 10%. Find the percentage change in the overall gain.	CO4	5 Marks
		(OR)		
6	a)	Derive the expression for frequency of oscillations and the minimum gain required for sustained oscillations of the RC phase shift oscillator with neat diagram.	CO3	10 Marks
	b)	An Hartley oscillator is designed with L_1=20μH, L_2=02mH and a variable capacitance. Determine the range of capacitance value, if the frequency is varied between 950 to 2050kHz.	CO4	4 Marks

UNIT-IV

7	a)	Analyze the working of series fed class A power amplifier and derive the equation for efficiency.	CO6	10 Marks
	b)	For transformer, the load connected to the secondary has an impedance of 8Ω. Its reflected impedance on primary is observed to be 648Ω. Calculate the turn ratio.	CO4	4 Marks
		(OR)		
8	a)	Explain the working of complementary symmetry class-B push-pull power amplifier and derive the equation for efficiency.	CO3	8 Marks
	b)	Write short notes on thermal stability and heat sinks.	CO2	6 Marks

UNIT-V

9	a)	Draw and explain the working of double tuned amplifier.	CO2	8 Marks
	b)	The bandwidth for double tuned amplifier is 10kHz. Calculate the bandwidth if such three stages are cascaded.	CO5	6 Marks

(OR)

10		Explain the frequency response of stagger pair and derive the expression for the gain of stagger tuned amplifier.	CO5	14 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

SIGNALS AND SYSTEMS

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define and sketch the following elementary continuous time signals. i) Unit impulse signal. ii) Exponential. iii) unit step function.	CO3	7 Marks
	b)	Check the system $y(t) = \cos[x(t)]$ is linear, Time invariant and stable.	CO4	7 Marks
		(OR)		
2	a)	Define the following properties for a continuous time system. i) Causal or non causal. ii) Time variant or time invariant. iii) Linear or non linear. iv) Stable or unstable.	CO3	7 Marks
	b)	Test whether the signal is periodic or Not. If so find the fundamental Period. i) $x(t) = e^{j\,10t}$. ii) $x(t) = \cos(\pi/3t) + \sin(\pi/5t)$.	CO4	7 Marks

UNIT-II

3	a)	Explain about complex Fourier spectrum.	CO3	7 Marks
	b)	Find the Fourier transform of x(t) = u(2t), where u(t) is the unit step function.	CO2	7 Marks
		(OR)		
4	a)	State any four properties of Fourier series.	CO2	7 Marks
	b)	Define Fourier transform. Explain the properties of Fourier transform.	CO3	7 Marks

UNIT-III

5	a)	State and prove any four properties of Auto correlation function.	CO2	7 Marks
	b)	Determine the autocorrelation function and energy spectral density function of $x(t) = e^{-at}u(t)$.	CO1	7 Marks
		(OR)		
6	a)	Explain briefly detection of periodic signals in the presence of noise by correlation.	CO2	7 Marks
	b)	Analyze the conditions required by the real time communication system in order to have distortion less transmission.	CO3	7 Marks

UNIT-IV

7	a)	Find the Laplace transform of the following signals. i) Impulse function. ii) unit step function. iii) A sin (w_0t) $u(t)$.	CO2	7 Marks
	b)	Explain how Laplace transform is useful to analyze the stability of system in S domain.	CO1	7 Marks
		(OR)		
8	a)	Prove the scaling and time shifting properties of Laplace transform.	CO4	7 Marks
	b)	Determine the Laplace transform of $x(t) = e^{-at}$ Cos(wt) $u(t)$.	CO1	7 Marks

UNIT-V

9	a)	State and prove the following properties of Z transform. i) Linearity. ii) Time shifting. iii) Differentiation.	CO1	7 Marks
	b)	What is aliasing? Explain its effect on sampling.	CO2	7 Marks
		(OR)		
10	a)	Derive the relation between Z transform and Fourier transform.	CO3	7 Marks
	b)	Using appropriate method find $y(n)$ of the Z transformed signal $Y(Z)=Z/(Z-1)^2$.	CO1	7 Marks

❀ ❀ ❀

CODE No.:16BT30403 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

SWITCHING THEORY AND LOGIC DESIGN
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Determine the base of the numbers in each case for the following operations to be correct. i) 14/2 = 5. ii) 54/4 = 13. iii) 24 + 17 = 40. iv) 378 = 275.	CO1	8 Marks
	b)	Perform the subtraction on the given unsigned binary numbers using the 2' s complement method. i) 10011 – 10001. ii) 1001 – 101000.	CO1	6 Marks
		(OR)		
2	a)	Express the following function as a sum of min terms and as a product of max terms: $F(A,B,C,D) = B'D + A'D + BD$.	CO1	6 Marks
	b)	Detect and correct the errors of even parity hamming code word. (i) 1110111. (ii) 0111101.	CO4	8 Marks

UNIT-II

3	a)	Simplify the Boolean functions. using four-variable maps: $F(A, B, C, D) = \Sigma (0, 2, 4, 5, 6, 7, 8, 10, 13, 15)$.	CO1	8 Marks
	b)	Draw a NAND logic diagram that implements the complement of the function: $F(A , B, C, D) = \Sigma(0, 1, 2, 3, 4, 8, 9, 12)$	CO1	6 Marks
		(OR)		
4		Using tabulation method simplify the $F(A, B, C, D) = \Sigma m(1, 3, 8, 10, 15) + \Sigma d(0, 2, 9)$.	CO1	14 Marks

UNIT-III

5	a)	Design a combinational circuit with three inputs and one output. i) The output is 1 when the binary value of the inputs is less than 3. The output is 0 otherwise. ii) The output is 1 when the binary value of theinputs is an even number.	CO3	9 Marks
	b)	Implement a full adder with two 4 x 1 multiplexers.	CO3	5 Marks
		(OR)		
6	a)	Design a combinational circuit that convert the BCD to binary number.	CO3	8 Marks
	b)	Implement the following functions on decoder logic. $Y_1 = \Sigma(0, 1, 3, 6, 7)$, $Y_2 = \Sigma(0, 2, 4, 7)$, $Y_3 = \Sigma(1, 3, 6, 7)$.	CO3	6 Marks

UNIT-IV

7	a)	What is difference between latch and flip flop? Explain about clocked RS flip-flop using NAND gates.	CO1	6 Marks
	b)	Convert D flip-flop into T and JK flip-flops.	CO2	8 Marks
		(OR)		
8	a)	Draw the schematic circuit of JK master slave flip-flop. Give its truth table and justify the entries in the truth table.	CO1	8 Marks
	b)	What are the different types of registers? Explain the Serial Input Parallel Output shift register.	CO6	6 Marks

UNIT-V

9	a)	Explain operation of Johnson counter with a diagram.	CO2	4 Marks
	b)	Explain the operation of universal shift register with suitable examples.	CO1	10 Marks

(OR)

10		A sequential circuit with two D flip-flops A and B, two inputs, x and y ; and one output z is specified by the following next-state and output equations $A(t + 1) = XY' + XB$, $B(t + 1) = XA + XB'$ and $z = A$ i) Draw the logic diagram of the circuit. ii) List the state table for the sequential circuit. iii) Draw the corresponding state diagram.	CO5	14 Marks

CODE No.:16BT40101 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

CONCRETE TECHNOLOGY
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		What are the Bogue's compounds and explain in detail about their role and influences on the properties of Fresh and Hardened concretes and Durability of concretes?	CO1	14 Marks
		(OR)		
2		Write different classifications aggregates and explain the influences of size, shape, texture and grading on the properties of Fresh and Hardened concretes and Durability of concretes.	CO1	14 Marks

UNIT-II

3		Explain what is the workability of concrete and its influences on the properties of Fresh and Hardened concretes and Durability of concretes.	CO2	14 Marks
		(OR)		
4		Explain about the following properties of hardened concrete and the procedure to measure these properties: i) Compressive strength. ii) Tensile strength. iii) Flexural strength. iv) Maturity Concept of the concrete.	CO2	14 Marks

UNIT-III

5	a)	Explain in detail how the Creep and the Drying Shrinkage will affect the performance of the concrete.	CO1	10 Marks
	b)	Explain the difference between plastic shrinkage and drying shrinkage.	CO1	4 Marks
		(OR)		
6		Explain in detail the procedure to conduct NDT of a structure deteriorated due to the corrosion of reinforcing steel.	CO5	14 Marks

UNIT-IV

7		Explain in detail about ACI methodology of Concrete Mix Design.	CO3	14 Marks
		(OR)		

8	Design a concrete mix for M35 grade for fly ash concrete for the pumped concreting, using rounded aggregate and using IS method. The data for the mix design is as given below:	CO3	14 Marks

i) Type of Cement:	OPC 43 Grade
ii) Max. Size of Aggregate:	20mm
iii) Percentage of Fly Ash:	40 by wt. of total cementitious material,
iv) Exposure Condition:	Severe (RCC)
v) Workability:	100mm (Slump)
vi) Minimum Cement Content:	320 kg/m^3
vii) Maximum w/c Ratio:	0.45
viii) Method of Placing Concrete:	Pumping
ix) Type of Aggregate:	Rounded
x) Super plasticizer:	Sp. Gr. 1.1 and 1.2% by wt. of Total Cementitious Material
xi) Specific gravity of Cement:	3.15
xii) Specific Gravity of Fly Ash:	2.13
xiii) Specific gravity of FA:	2.70
xiv) Specific gravity of CA:	2.80
xv) Water Absorption of FA:	0.7 percent
xvi) Water Absorption of CA:	0.5 percent
xvii) Total Moisture Content FA:	6.0 percent
xviii) Total Moisture Content CA:	2.0 percent
xix) Grading of CA:	Table 2 of IS 383
xx) Grading of Fine Aggregate:	Zone 1
xxi) Characteristic Strength:	M35

UNIT-V

9	Write short notes on following items: i) Mass Concreting. ii) Ready Mixed Concreting. iii) Under Water Concreting.	CO1	14 Marks

(OR)

10	Write short notes on following items: i) Roller Compacted Concreting. ii) Pumped Concreting. iii) Sprayed Concreting (Shot-Creeting).	CO1	14 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, March 2021

ENGINEERING GEOLOGY

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Give a brief about scope of geology in civil engineering.	CO1	14 Marks
		(OR)		
2		List the types of weathering. Give a brief about Chemical weathering of rocks. What is the significance of weathering of rocks in civil engineering?	CO1	14 Marks

UNIT-II

3		Give a brief about identification of minerals using physical properties.	CO2	14 Marks
		(OR)		
4		Give a brief about how various types of rocks are formed. What are their characteristic features? How do you distinguish major rock types in the field?	CO2	14 Marks

UNIT-III

5	a)	Distinguish between strike and dip with neat sketch.	CO2	6 Marks
	b)	Highlight on civil engineering considerations of faults.	CO2	8 Marks
		(OR)		
6		Give a brief about sub surface investigation using electrical resistivity method. What are the applications of electrical resistivity method in civil engineering?	CO4	14 Marks

UNIT-IV

7		What do you understand about hydrological properties of rocks and highlight on measures to improve groundwater resources?	CO6	14 Marks
		(OR)		
8	a)	Explain the causes of occurrence of earthquakes.	CO5	8 Marks
	b)	Highlight on measures to prevent the occurrence of landslides.	CO5	6 Marks

UNIT-V

9		Give a brief about geological considerations in selection of a suitable site for construction of dam and reservoir.	CO3	14 Marks
		(OR)		
10	a)	Present any case study of a dam how ignorance of geological factors lead to failure of dams.	CO7	7 Marks
	b)	Give a brief about geological considerations in site selection for a bridge.	CO3	7 Marks

❀ ❀ ❀

CODE No.: 16BT40103 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

ENGINEERING HYDROLOGY
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 The isohyets drawn for a storm which occurred over a drainage basin of area 950 sq.km yielded the following information. Determine the average depth of rainfall over the basin. CO2 14 Marks

Isohyetal interval in mm	85-75	75-65	65-55	55-45	45-35
Area between isohyetes in sq.km	125	236	264	175	150

(OR)

2 The average annual rainfalls in cm at 4 existing raingauge stations in a basin are 105, 79, 70 and 66. If the average depth of rainfall over the basin is to be estimated within 10% error, determine the additional number of gauges needed. CO2 14 Marks

UNIT-II

3 List infiltration indices and In a 140 min storm the following rates of rainfall were observed in successive 20 min intervals:
6, 6, 18, 13, 2, 2 and 12 mm/h. Assuming the ø index value as 3 mm/h and an initial loss of 0.8 mm, determine the total rainfall, net runoff and W- index for the storm. CO2 14 Marks

(OR)

4 a) Differentiate between evaporation and Evapotranspiration. What are the various factors affecting Evapotranspiration? CO1 7 Marks

b) Describe interception and draw typical interception loss curve with a neat sketch. CO1 7 Marks

UNIT-III

5 During a recuperation test conducted on an open well in a region, the water level in the well was depressed by 3m and it was observed to rise by 1.75m in 75 minutes. What is the specific yield of open wells in that region. What could be the yield from a well of 5m diameter under a depression head of 2.5m. What should be the diameter of the well to givbe a yield of 12 lit/s under a depression head of 2m. CO4 14 Marks

(OR)

6 Describe the estimation of yield of an open well using recuperation test. CO3 14 Marks

UNIT-IV

7 a) Differentiate channel routing and reservoir routing. CO3 7 Marks

b) Describe the most commonly used two techniques for routing of floods through reservoir. CO5 7 Marks

(OR)

8 Route the following flood hydrograph through a river reach for which K=12.0 hr, and x=0.20. At the start of the inflow flood, the outflow discharge is 10 cumec. CO4 14 Marks

Time(hr)	0	6	12	18	24	30	36	42	48	54
Inflow (cumec)	10	20	50	60	55	45	35	27	20	15

UNIT-V

9	Discuss erosion and reservoir sedimentation problems in India.	CO6	14 Marks
	(OR)		
10	Discuss about reservoir sedimentation control.	CO7	14 Marks

CODE No.:16BT40104 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

STRUCTURAL ANALYSIS - I
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		A point with in a loaded beam in under a bending stress of 35Mpa (tensile) and a shear stress of 35Mpa. Find out the principal planes passing through the point and principle stress by using Mohr's circle method.	CO1	14 Marks
		(OR)		
2		The stresses on two perpendicular planes through a point in a body are 30Mpa and 15Mpa both tensile along with a shear stress of 25Mpa. Find the magnitude and direction of principal stresses. Also find the magnitude of maximum shear stress	CO1	14 Marks

UNIT-II

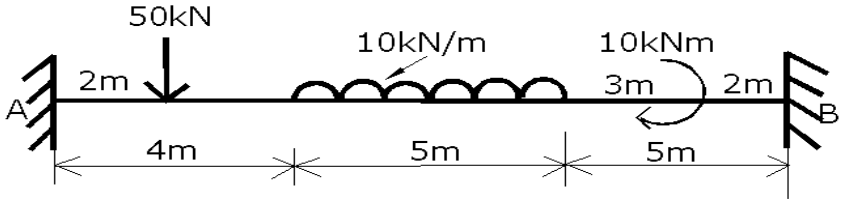
3		Derive expression to find out the equations for slope and deflection of a simply supported beam of length L and uniform EI with a central point load P. evaluate its maximum slope and deflection.	CO1	14 Marks
		(OR)		
4	a)	Using moment area theorem, find the maximum deflection in the simply supported beam carrying uniformly distributed load of intensity w per metre length	CO3	7 Marks
	b)	A cantilever AB of span 6m is fixe at the end A and propped at end B. It carries a point load of 50kN at mid span level of prop is same as that of fixed end. i) Draw S.F.D and B.M.D. ii) Determine reaction at prop.	CO2	7 Marks

UNIT-III

5	a)	Mention the assumptions and limitations of the Euler's formula.	CO1	8 Marks
	b)	A short column of a rectangular section of size 400 x 200mm is considered of a material with a maximum permissible compressive stress of 90N/mm^2 and tensile stress of 25N/mm^2, if the compressive load is 1500kN, at what eccentricity can be applied along two principal axes. If the load is increased to 3000kN, what is the permissible eccentricity along the principal axes?	CO5	6 Marks
		(OR)		
6		A hollow cost iron column with fixed ends supports an axial load of 1000kN. If the column is 6m long and has an external diameter of 250mm. find the thickness of metal required. Use the Rankine's formulae. Taking a constant = 1/6400 and assume working stress of 80N/mm^2.	CO3	14 Marks

UNIT-IV

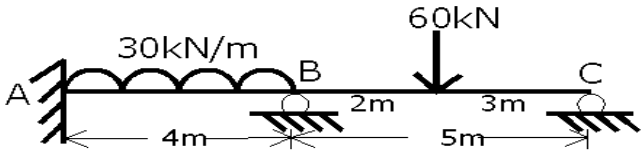
7 a) Calculate the fixed end moments for the given beam CO4 7 Marks



b) A beam AB of span 5m fixed at both ends carries a uniformly distributed load of 18kN/m over the whole span. The right end support B sinks by 15mm. determine the fixed end moments and sketch bending moment diagram. Take E = 200kN/mm^2 and I = 7.5 x 10^{7}mm^4. Find the Fixed end moments for the given beam, support A sinks by 2mm and support B sinks by 3mm. E = 2 x 10^{5}N/mm^2, I = 40000cm^4. CO4 7 Marks

(OR)

8 Analyze the given continuous beam by Clapreyon's theorem of three moments also draw shear force and bending moment diagrams. CO4 14 Marks



UNIT-V

9 A bolt is subjected to an axial pull of 12kN together with a transverse shear force of 6kN. Determine the required diameter of the bolt by using: CO2 14 Marks

i) Maximum principal stress theory.
ii) Maximum Strain theory.
iii) Maximum shear stress theory.

Use the following data:

elastic limit in tension= 300N/mm^2, factor of safety = 3 and poisons ratio = 0.3

(OR)

10 A cylindrical shaft made of steel of yield strength 350MPa is subjected to static load consisting of bending moment of 10kN.m and a torsional moment of 30kN.m. Determine the shaft using: CO1 14 Marks

i) Maximum principal stress theory.
ii) Maximum Strain theory.
iii) Maximum shear stress theory.

Take E = 210Gpa, Poisson's ratio = 0.25 and factor of safety = 2.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

WATER SUPPLY ENGINEERING

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Prepare a list of factors which are to be considered in the selection of source for a water supply scheme. How does the quality of ground water differ from surface water?	CO2	10 Marks
	b)	Find the alkalinity if the water sample is having CO_3^{-2} ions of 90 mg/L and HCO_3^{-1} of 61 mg/L.	CO1	4 Marks
		(OR)		
2	a)	Classify the different types of springs.	CO1	7 Marks
	b)	Explain how water is drawn from infiltration galleries with a neat sketch.	CO1	7 Marks

UNIT-II

3	a)	Draw a neat sketch of canal intake and explain the working principle. State its merit and demerits.	CO1	4 Marks
	b)	The population of a town as per past census records are furnished below. Predict the population in the year 2031 and 2041 using the Geometrical increase method.	CO2	10 Marks

Census Year	1941	1951	1961	1971	1981	1991	2001	2011
Population	44642	50487	56816	63859	71458	78543	88131	100290

(OR)

4	a)	Explain the working principle of a reservoir intake with a neat sketch.	CO1	7 Marks
	b)	Recommend desirable and permissible quality standards for drinking water as per IS 10500:2012.	CO7	7 Marks

UNIT-III

5	a)	Explain working of rapid sand filter with the help of neat sketch.	CO1	7 Marks
	b)	Estimate the settling velocity of a particle of 0.06mm diameter having specific gravity of 2.65 in temperature of 20^0C. The kinematic viscosity of $\gamma = 1.007 \times 10^{-6}$ m^2/ sec.	CO2	7 Marks
		(OR)		
6	a)	Explain the sedimentation by coagulation process using alum and state the merits and demerits of using alum.	CO5	7 Marks
	b)	Design a slow sand filer for a town of population 60000 persons, provided water supply rate 160Lpcd. Take filtration rate as 2.5 litres per minute, m^2, L/B ratio as 2, maximum demand as 1.8 times average demand.	CO3	7 Marks

UNIT-IV

7	a)	What are the effects of excess concentration of Fluoride in water? List the methods available for defluoridation and explain any one of them.	CO6	7 Marks
	b)	Write short notes on types of valves.	CO6	7 Marks
		(OR)		
8	a)	Discuss about the Ion exchange method of water softening with a sketch.	CO4	7 Marks
	b)	Describe the types of hardness present in water.	CO1	7 Marks

UNIT-V

9		Explain the methods of detection of leakage in the distribution pipes.	CO5	14 Marks
		(OR)		
10		Briefly discuss the design principles involved the design of water supply network to be laid in a multi storied buildings.	CO6	14 Marks

❀ ❀ ❀

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

ELECTRICAL MEASUREMENTS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Derive the Torque equation for Moving iron Instruments.	CO1	7 Marks
	b)	Discuss various errors that occur in measurements and how can they be compensated.	CO1	7 Marks
		(OR)		
2	a)	Describe systematic errors in measuring instruments.	CO1	7 Marks
	b)	A permanent magnet moving coil instrument has a coil of dimensions 15mm x 12mm. The flux density In the air gap is 1.'8 x 10^{-a} Wb/m^2 and the spring constant is 0.14 x 10^{-6} Nm/rad. Determine the number of turns required to produce an angular deflection of 90^0 when a current of 5 mA is flowing through the coil.	CO4	7 Marks

UNIT-II

3	a)	Explain the function of a current transformer. How does a current transformer differ from an ordinary power transformer?	CO2	7 Marks
	b)	List the various parameters that affect the characteristics of current transformer.	CO4	7 Marks
		(OR)		
4	a)	A current transformer has a single turn primary and a 200 turns secondary winding. The secondary supplies a current of 5 A to a non inductive burden of 1Ω resistance. The requisite flux is set up in the core by an mmf of 80 A. The frequency is 50 Hz and the net cross section of the core is 1000 mm^2.	CO4	7 Marks
	b)	Why secondary of current transformer should never be open when the Primary winding is energized?	CO4	7 Marks

UNIT-III

5	a)	Draw a neat sketch and explain the operation of a single phase induction type energy meter.	CO1	7 Marks
	b)	In a dynamometer wattmeter the moving coil bas 500 turns of mean diameter 30 mm. Estimate the torque if the axes of the field and moving coils are at (i) 60° (ii) 90º when the density in the field coils is 15 x 10^{-3} Wb/m^2, the current in moving coil is 0'05 A and the power factor is 0.866.	CO4	7 Marks
		(OR)		
6	a)	Explain the working of Low power factor Electrodynamometer type wattmeter with a neat diagram.	CO5	7 Marks
	b)	A 230V, single phase, watt hour meter has a constant lead of 4 A passing through it for 6 hours at unity power factor. If the meter disk makes 2208 revolutions during this period, what is the meter constant in revolutions per kWh? Calculate the power factor of the load if the number of revolutions made by the meter are 1472, when operating at 230V and 5A for 4 hours.	CO4	7 Marks

UNIT-IV

7	a)	What are the different difficulties encountered in the measurement of high resistances? Explain how these difficulties are overcome.	CO3	7 Marks
	b)	In the Wheatstone bridge, the values of resistances of various arms are P = 1000Ω, Q = 100Ω, R = 2,005Ω and S = 200Ω. The battery has an emf of 5V and negligible internal resistance. The galvanometer has a current sensitivity of 10mm/μA and an internal resistance of 100Ω. Calculate the deflection of galvanometer and the sensitivity of the bridge in terms of deflection per unit change in resistance.	CO5	7 Marks

(OR)

8	a)	List the advantages and disadvantages of Desauty's Bridge.	CO1	5 Marks
	b)	A bridge consists of the following : Arm ab - a choke coil having a resistance R_1 and inductance L_1. Arm bc - a non-inductive resistance R_3. Arm cd - a mica condenser C_4 in series with a non-inductive resistance R_4. Arm da - a non-inductive resistance R_2 when this bridge is fed from a source of 500 Hz, balance is obtained under following conditions: R_2 = 2410Ω; R_3 = 750Ω; C_4 = 0.35μF, R_4 = 64.5Ω. The series resistance of capacitor is = 0.4Ω. Calculate the resistance and inductance of the choke coil. The supply is connected between **a** and **c** and the detector is between **b** and **d**.	CO3	9 Marks

UNIT-V

9	a)	A simple slide wire is used for measurement of current in a circuit. The voltage drop across a standard resistor of 0.1Ω is balanced at 75cm. Find the magnitude of current if the standard cell **emf** of 1.45V is balanced at 50cm.	CO4	7 Marks
	b)	Explain the operation of DC crompton potentiometer with a neat diagram.	CO1	7 Marks

(OR)

10	a)	Explain how lissajous figures can be used in frequency measurement.	CO1	7 Marks
	b)	Explain about each block of digital voltmeter and mention its advantages.	CO1	7 Marks

CODE No.:16BT40202 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

GENERATION OF ELECTRIC POWER
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the growth in Electrical power sector in India.	CO7	7 Marks
	b)	List out the site selection factor for hydroelectric power station and thermal power plant.	CO5	7 Marks
		(OR)		
2	a)	Draw the water circuit in a thermal power plant. Explain the state of water in each stage.	CO1	7 Marks
	b)	Compare impulse and reaction turbines	CO2	7 Marks

UNIT-II

3	a)	Classify the nuclear reactors based on fossil fuels, moderators and control rods used. Explain them briefly.	CO1	7 Marks
	b)	Explain Breeder reactor with neat diagram. Also list out its advantages and limitations.	CO1	7 Marks
		(OR)		
4	a)	Discuss the advantages and disadvantages of Diesel power plant. Also mention the reason for not using diesel power plants for generating bulk powers.	CO2	7 Marks
	b)	Draw the layout of gas turbine power plant and briefly explain the function of various components.	CO2	7 Marks

UNIT-III

5	a)	i) Explain the factors affecting the performance of PV Cell. ii) Mention advantages and disadvantages of PV Cell.	CO6	6 Marks
	b)	Explain the classification of wind turbines based on orientation with neat sketches.	CO8	8 Marks
		(OR)		
6	a)	Explain anaerobic digestion for biogas with neat sketch.	CO6	7 Marks
	b)	Briefly describe on microgrid. Mention its significance.	CO8	7 Marks

UNIT-IV

7	a)	A generating station has the following daily load cycle.	CO2	8 Marks

Time (Hours)	0–6	6–10	10–12	12–16	16–20	20–24
Load (MW)	20	25	30	25	35	20

Draw the load curve and load duration curve. Determine:
i) Maximum demand. ii) Units generated per day.
iii) Average load and. iv) Load factor.

	b)	Explain Diminishing Value method to determine the depreciation cost of the power plant.	CO4	6 Marks
		(OR)		

8 a) A generating station has the following daily loads: CO2 7 Marks

0–6 am	6–8 am	8–12 Noon	12–14 pm	14–18 pm	18–20 pm	20–24 pm
4000 kW	3000 kW	8000 kW	2000 kW	7500 kW	3000 kW	4500 kW

Sketch load duration curve with the given data and determine the load factor, demand factor if connected load is 12000 kW, and plant use factor and plant capacity factor assuming capacity of plant as 11000 kW.

b) Determine the cost of generation per kW-hr from the following data. CO4 7 Marks

Capacity of the plant - 120MW
Capital cost - Rs.1,200 per kW installed
Interest and depreciation - 10% on capital
Fuel consumption - 1.2 kg / kW-hr.
Fuel cost - Rs. 40 tone
Salaries, wages, repairs and maintenance - 6,00,000 / year.

The maximum demand is 80 MW and load factor is 40%.

UNIT-V

9 a) Explain the various operation modes of cogeneration systems with neat block diagrams. CO6 7 Marks

b) i) List out the disadvantages of Low power factor. CO3 7 Marks
ii) List out the causes for low power factor.

(OR)

10 a) Predict the risks involved in running cogeneration systems and also list the practical constraints to install cogeneration plant. CO8 6 Marks

b) Explain the series and shunt connection of capacitors with necessary equations and phasor diagrams. CO3 8 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, March 2021

TRANSFORMERS AND INDUCTION MACHINES

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Compare between core type and shell type transformers.	CO1	6 Marks
	b)	Derive the EMF equation of a 1-phase transformer and calculate the emf / turn, if the flux is 0.015 Wb at a frequency of 50 Hz.	CO2	8 Marks
		(OR)		
2	a)	Develop the equivalent circuit of a single-phase transformer.	CO1	6 Marks
	b)	A 200 kVA, 1- phase, 3300 / 400 V transformer gave the following results in the short circuit test with 200 V applied to the primary and secondary short circuited, the primary current was full load value and the input power was 1650 W. Calculate the secondary potential difference and the % of regulation when the full load current was passing at a 0.707 p.f. lagging with normal primary voltage.	CO4	8 Marks

UNIT-II

3	a)	Explain the O.C. and S.C. tests on the transformer and hence explain the evolution of equivalent circuit from it.	CO1	9 Marks
	b)	Explain the autotransformer with neat diagram.	CO4	5 Marks
		(OR)		
4	a)	With neat phasor diagram, explain the voltage regulation of three-phase transformer.	CO1	8 Marks
	b)	The maximum efficiency of a 500kVA. 3,300 V/500 V, 50Hz single phase transformer is 97% and occurs at ¾ full load, unity power factor. If the impedance is 10%, calculate the regulation at full load, power factor 0.8 lagging.	CO4	6 Marks

UNIT-III

5	a)	Determine the following impedance parameters of a 3-phase transformer i) Z_p, ii) Z_s, iii) Z_t	CO1	6 Marks
	b)	A 5000 KVA, 3-Phase transformer 6.6/33 KV, Δ/Y, has no load loss of 15KW. The impedance drop at full load is 7%. Find out the primary voltage when a load of 3200 KW at 0.8 power factor is delivered at 33KV.	CO3	8 Marks
		(OR)		
6	a)	Explain about 3- Phase transformation.	CO1	5 Marks
	b)	A 3-Phase step-down transformer is connected to 7.8 KV mains and takes 12A. Calculate the secondary line voltage, line current and output for the following connections. i) Δ/Δ ii) Y/ Y iii) Y/Δ The ratio of turns per phase is 15. Neglect losses.	CO4	9 Marks

UNIT-IV

7	a)	Describe briefly the working principle of slip ring induction motor. Explain how its speed control is effected.	CO1	9 Marks
	b)	Explain about torque-slip characteristics.	CO2	5 Marks

(OR)

8	a)	Draw and explain the equivalent circuit of Induction Motor with the help of phasor diagram.	CO1	8 Marks
	b)	A 3-phase, 50Hz induction motor has a full-load speed of 960rpm. Calculate i) no. of poles; ii) slip frequency; iii) speed of rotor field w.r.t rotor structure, stator structure and stator field.	CO4	6 Marks

UNIT-V

9	a)	Explain about No-load and blocked rotor tests.	CO1	6 Marks
	b)	A 25KW, 415V, 8-pole, delta connected squirrel cage induction motor gave the following test results: No load test: 415V, 10A, 300W Block rotor test: 80V, 40A, 1400W The D.C resistance of the stator winding per phase measured immediately after block rotor test is 0.6Ω. Calculate the additional losses and equivalent circuit parameters.	CO4	8 Marks

(OR)

10	a)	Explain about the speed control of induction motor by cascade operation.	CO1	7 Marks
	b)	Explain the following: i) Crawling ii) Cogging.	CO2	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

DESIGN OF MACHINE ELEMENTS-I
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

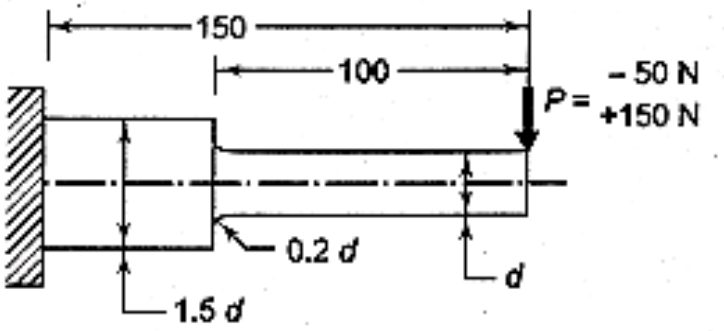
1	a)	Explain the design process with the help of a flow diagram.	CO1	8 Marks
	b)	What are the various manufacturing considerations in machine design? Explain.	CO1	6 Marks

(OR)

2	a)	What are the different theories of failure? Explain briefly.	CO1	8 Marks
	b)	An unknown weight falls through 10 mm on a collar rigidly attached to the lower end of a vertical bar 3m long and 600mm^2 in cross section. If the maximum instantaneous extension is known to be 2mm, determine the corresponding stress and the value of unknown weight. Take E = 200kN/mm^2.	CO2	6 Marks

UNIT-II

3		A cantilever beam made of cold drawn steel 40C8 (σ_{ut} = 600N/mm^2 and σ_{yt} = 380N/mm^2) is shown in figure. The force P acting at the free end varies from –50N to +150N. The expected reliability is 90% and the factor of safety is 2. The notch sensitivity factor at the fillet is 0.9. Determine the diameter 'd' of the beam at the fillet cross section by taking surface finish factor of 0.77, size factor of 0.85 and stress concentration factor of 1.44.	CO4	14 Marks



(OR)

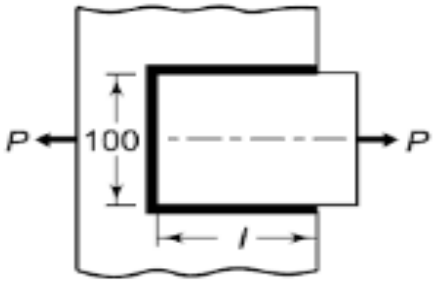
4	a)	What is stress concentration? How does it affect the fatigue strength?	CO1	6 Marks
	b)	A machine member is made of plain carbon steel of ultimate strength 650N/mm^2 and endurance limit of 300N/mm^2. If the member is subjected to a fluctuating torsional moment which varies from –200N-m to 400N-m. Design the member using (i) Goodman's line and (ii) Soderberg line.	CO2	8 Marks

UNIT-III

5	a)	What is bolt of uniform strength? Explain the two methods to make a bolt of uniform strength.	CO1	6 Marks
	b)	Explain the method of determining the size of the bolt when the bracket carries an eccentric load perpendicular to the axis of the bolts.	CO3	8 Marks

(OR)

6	a)	With neat sketches, explain different types of welded joints.	CO1	6 Marks
	b)	A steel plate 100mm wide and 10mm thick is joined with another steel plate by means of single transverse and double parallel fillet welds, as shown in figure. The strength of welded joint should be equal to the strength of the plates to be joined. The permissible tensile and shear stresses for the weld material and the plates are 70 and 50N/mm^2 respectively. Find the length of each parallel fillet weld. Assume tensile force acting on the plates as static.	CO4	8 Marks



UNIT-IV

7	a)	What type of stresses induced in shafts? Explain.	CO1	5 Marks
	b)	Compare the weight, strength and stiffness of a hollow shaft of the same external diameter as that of solid shaft. The inside diameter of the hollow shaft being half the external diameter. Both the shafts made of same material and have same length.	CO4	9 Marks

(OR)

8		Design a bushed pin type flexible coupling for connecting a motor shaft to a pump shaft for the following service conditions: Power to be transmitted = 40 kW, speed of the motor shaft = 1000 r.p.m. The material properties are: The allowable shear and crushing stress for shaft and key material is 40MPa and 80MPa respectively, allowable shear stress for cast iron is 15MPa, Allowable bearing pressure for rubber bush is 0.8N/mm^2 and the material of the pin is same as that of shaft and key. Draw neat sketch of the coupling.	CO3	14 Marks

UNIT-V

9		Design and draw a socket and spigot cotter joint to support a load varying from 30kN in compression to 30kN in tension. The material used is carbon steel for which the following allowable stresses may be used: Tensile stress = 50MPa; Shear stress = 35MPa and Crushing stress = 90MPa.	CO3	14 Marks

(OR)

10	a)	Distinguish between cotter joint and knuckle joint.	CO1	4 Marks
	b)	Describe in detail the design procedure of knuckle joint.	CO1	10 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, March 2021

DYNAMICS OF MACHINERY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Briefly explain the working of cone clutch with neat diagram.	CO1	4 Marks
	b)	A plate clutch has three discs on the driving shaft and two discs on the driven shaft, providing four pairs of contact surfaces. The outside diameter of the contact surfaces is 240 mm and inside diameter 120 mm. Assuming uniform pressure and $\mu = 0.3$; find the total spring load pressing the plates together to transmit 25 kW at 1575 r.p.m. If there are 6 springs each of stiffness 13 kN/m and each of the contact surfaces has worn away by 1.25 mm, find the maximum power that can be transmitted, assuming uniform wear.	CO2	10 Marks

(OR)

2	a)	Discuss the working of prony brake dynamometer with neat sketch and derive the expression for brake power.	CO1	4 Marks
	b)	A simple band brake operates on a drum of 600 mm in diameter that is running at 200 r.p.m. The coefficient of friction is 0.25. The brake band has a contact of 270°, one end is fastened to a fixed pin and the other end to the brake arm 125 mm from the fixed pin. The straight brake arm is 750 mm long and placed perpendicular to the diameter that bisects the angle of contact. i) What is the pull necessary on the end of the brake arm to stop the wheel if 35 kW is being absorbed ? What is the direction for this minimum pull ? ii) What width of steel band of 2.5 mm thick is required for this brake if the maximum tensile stress is not to exceed 50 N/mm^2?	CO2	10 Marks

UNIT-II

3	a)	Explain the effect of Gyroscopic couple on Naval ship, when it takes right and left turn, engine is rotating both clockwise and anti clockwise looking from bow side with neat sketches.	CO2	7 Marks
	b)	Find the angle of inclination with respect to the vertical of a two wheeler negotiating a turn. Given: combined mass of the vehicle with its rider 250 kg ; moment of inertia of the engine flywheel 0.3 kg-m^2 ; moment of inertia of each road wheel 1 kg-m^2; speed of engine flywheel 5 times that of road wheels and in the same direction; height of centre of gravity of rider with vehicle 0.6 m; two wheeler speed 90 km/h; wheel radius 300 mm; radius of turn 50 m.	CO3	7 Marks

(OR)

4	a)	Derive the expression for energy stored in Flywheel?	CO2	6 Marks
	b)	The turning moment diagram for a multi cylinder engine has been drawn to a scale 1 mm = 600 N-m vertically and 1 mm = 3° horizontally. The intercepted areas between the output torque curve and the mean resistance line, taken in order from one end, are as follows: + 52, – 124, + 92, – 140, + 85, – 72 and + 107 mm^2, when the engine is running at a speed of 600 r.p.m. If the total fluctuation of speed is not to exceed ± 1.5% of the mean, find the necessary mass of the flywheel of radius 0.5 m.	CO3	8 Marks

UNIT-III

5	a)	Briefly discuss about the sensitiveness and stability of governor?	CO1	4 Marks
	b)	In a spring loaded governor of the Hartnell type, the mass of each ball is 5 kg and the lift of the sleeve is 50 mm. The speed at which the governor begins to float is 240 r.p.m., and at this speed the radius of the ball path is 110 mm. The mean working speed of the governor is 20 times the range of speed when friction is neglected. If the lengths of ball and roller arm of the bell crank lever are 120 mm and 100 mm respectively and if the distance between the centre of pivot of bell crank lever and axis of governor spindle is 140 mm, determine the initial compression of the spring taking into account the obliquity of arms. If friction is equivalent to a force of 30 N at the sleeve, find the total alteration in speed before the sleeve begins to move from mid-position.	CO3	10 Marks

(OR)

6	a)	Derive the expression for mean speed of a porter governor.	CO2	6 Marks
	b)	All the arms of a Porter governor are 178 mm long and are hinged at a distance of 38 mm from the axis of rotation. The mass of each ball is 1.15 kg and mass of the sleeve is 20 kg. The governor sleeve begins to rise at 280 r.p.m. when the links are at an angle of 30° to the vertical. Assuming the friction force to be constant, determine the minimum and maximum speed of rotation when the inclination of the arms to the vertical is 45°.	CO3	8 Marks

UNIT-IV

7	a)	What is the need of balancing in rotary and reciprocating engine? Explain in detailed?	CO1	4 Marks
	b)	A, B, C and D are four masses carried by a rotating shaft at radii 100,125, 200 and 150 mm respectively. The planes in which the masses revolve are spaced 600 mm apart and the mass of B, C and D are 10 kg, 5 kg, and 4 kg respectively. Find the required mass A and the relative angular settings of the four masses so that the shaft shall be in complete balance.	CO4	10 Marks

(OR)

8	a)	Derive the expression for variation of tractive force induced due the partial balancing of two cylinder locomotives.	CO2	4 Marks
	b)	The following data apply to an outside cylinder uncoupled locomotive: Mass of rotating parts per cylinder = 360 kg; Mass of reciprocating parts per cylinder = 300 kg; Angle between cranks = 90°; Crank radius = 0.3 m; Cylinder centres = 1.75 m; Radius of balance masses = 0.75 m; Wheel centres = 1.45 m. If whole of the rotating and two-thirds of reciprocating parts are to be balanced in planes of the driving wheels, find: i) Magnitude and angular positions of balance masses, ii) Speed in kilometres per hour at which the wheel will lift off the rails when the load on each driving wheel is 30 kN and the diameter of tread of driving wheels is 1.8 m, and 3. Swaying couple at speed arrived at in (2) above.	CO4	10 Marks

UNIT-V

9	a)	Derive the expression for whirling speed of the shaft.	CO6	6 Marks
	b)	A machine of mass 75 kg is mounted on springs and is fitted with a dashpot to damp out vibrations. There are three springs each of stiffness 10 N/mm and it is found that the amplitude of vibration diminishes from 38.4 mm to 6.4 mm in two complete oscillations. Assuming that the damping force varies as the velocity, determine: i). the resistance of the dashpot at unit velocity; ii). the ratio of the frequency of the damped vibration to the frequency of the undamped vibration; and iii). the periodic time of the damped vibration.	CO5	8 Marks

(OR)

10	a)	Derive the natural frequency of transverse vibrations of shaft subjected to different loads by using Dunkerley's method.	CO2	6 Marks
	b)	The mass of a single degree damped vibrating system is 7.5 kg and makes 24 free oscillations in 14 seconds when disturbed from its equilibrium position. The amplitude of vibration reduces to 0.25 of its initial value after five oscillations. Determine: i) stiffness of the spring, ii) logarithmic decrement, and iii) damping factor, i.e. the ratio of the system damping to critical damping.	CO5	8 Marks

CODE No.: 16BT40303 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

FLUID MECHANICS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		The dynamic viscosity of oil, used for lubrication between a shaft and sleeve is 6 poise. The shaft is of diameter 0.4m and rotates at 190 r.p.m. Calculate the power lost in the bearing for a sleeve length of 90mm. The thickness of the oil film is 1.5mm.	CO5	14 Marks
		(OR)		
2		Explain the following fluid properties. i) Surface tension. ii) Viscosity. iii) Weight density. iv) Specific gravity.	CO1	14 Marks

UNIT-II

3		State the force momentum equation. How will you apply momentum equation for determining the force exerted by a flowing liquid in a pipe bend?	CO4	14 Marks
		(OR)		
4		The water is flowing through a pipe having diameters 20cm and 10cm at sections 1 and 2 respectively. The rate of flow through the pipe is 35litres/sec. The section 1 is 6m above datum and section 2 is 4m above datum. If the pressure at section 1 is 39.24 N/cm^2, find the intensity of pressure at section 2.	CO2	14 Marks

UNIT-III

5	a)	Give explanation of equivalent pipe and flow through parallel pipes.	CO1	7 Marks
	b)	For a town water supply, a main pipe line of diameter 0.4m is required. As pipes more than 0.35m diameter are not readily available, two parallel pipes of same diameter are used for water supply. If the total discharge in the parallel pipe is same as in the single main pipe, find the diameter of parallel pipe. Coefficient of discharge to be the same for all the pipes.	CO6	7 Marks
		(OR)		
6		Derive an expression for the force exerted by a jet of water on a stationary curved vane in the direction of flow.	CO5	14 Marks

UNIT-IV

7	a)	Give the classification of turbines with detailed explanation.	CO1	6 Marks
	b)	Describe briefly the function of various main components of pelton turbine with neat sketches.	CO1	8 Marks
		(OR)		
8		A turbine develops 7460 kW under a head of 24.7m at 135 r.p.m. What is the specific speed? What would be its normal speed and output under a head of 20.5m?	CO3	14 Marks

UNIT-V

9	a)	Define centrifugal pump and explain the working procedure of a single-stage centrifugal pump with neat sketch.	CO1	7 Marks
	b)	A centrifugal pump is to discharge 0.118m^3/s at a speed of 1450 r.p.m against head of 25m. The impeller diameter is 250mm, its width at outlet is 50mm and manometer efficiency is 75%. Determine the vane angle at the outer periphery of the impeller.	CO3	7 Marks

(OR)

10		Explain construction and working principle of a single acting reciprocating pump with a neat diagram.	CO1	14 Marks

CODE No.:16BT40304 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

MACHINE TOOLS AND MODERN MACHINING PROCESSES
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Describe various types of chips formed in metal cutting.	CO1	7 Marks
	b)	Distinguish between orthogonal and oblique cutting.	CO2	7 Marks
		(OR)		
2	a)	Enumerate the factors affecting tool life.	CO1	7 Marks
	b)	Discuss the Merchant's circle diagram and its importance in machining.	CO1	7 Marks

UNIT-II

3	a)	Explain about different operations performed on Lathe.	CO1	7 Marks
	b)	List various specifications of Lathe in detail.	CO1	7 Marks
		(OR)		
4	a)	Explain the working of Capstan and Turret Lathe with neat sketch.	CO1	7 Marks
	b)	Explain the working of Single Spindle Automatic Lathe.	CO1	7 Marks

UNIT-III

5	a)	Explain the working principle and principal parts of Planer with a neat diagram.	CO1	7 Marks
	b)	Distinguish between operations performed on Shaping and Slotting machines.	CO2	7 Marks
		(OR)		
6	a)	Design a boring machine to enlarge a 10mm drilled hole.	CO3	7 Marks
	b)	List different operations performed on a drilling machine.	CO1	7 Marks

UNIT-IV

7	a)	Compare about Grinding, Lapping and Honing operations.	CO1	7 Marks
	b)	Analyze the need for dressing of grinding wheels.	CO2	7 Marks
		(OR)		
8	a)	Discuss about Up milling and Down milling.	CO1	7 Marks
	b)	Explain the working of Horizontal milling machine with a neat sketch.	CO1	7 Marks

UNIT-V

9	a)	Analyze the importance to shift for Modern machining processes.	CO4	7 Marks
	b)	State the advantages of Abrasive Jet Machining and its applications.	CO5	7 Marks
		(OR)		
10	a)	Explain the principle involved in Electro Chemical Machining with a neat sketch.	CO5	7 Marks
	b)	State the advantages and limitations of Laser Beam Machining.	CO5	7 Marks

❀ ❀ ❀

CODE No.: 16BT40305 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

THERMAL ENGINEERING-I
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Discuss the relative merits and demerits of internal combustion and external combustion engines.	CO1	7 Marks
	b)	Draw the valve-timing diagram of four-stroke engine and explain the various processes.	CO1	7 Marks
		(OR)		
2	a)	Describe with working principle theoretical and actual valve timing diagrams of four stroke C.I Engine	CO1	7 Marks
	b)	Explain the effect of temperature on specific heats. What is the physical explanation for this variation on the performance of I.C Engine?	CO2	7 Marks

UNIT-II

3	a)	What are the basic parameters that influence the flame speed? Discuss the influence of Engine variables on the flame speed.	CO1	7 Marks
	b)	What is meant by abnormal combustion? Explain the phenomena of knock in S.I Engines.	CO1	7 Marks
		(OR)		
4	a)	What are the different required characteristics of a good combustion chamber for S.I. Engine? Explain.	CO1	7 Marks
	b)	Explain the different stages of combustion in C.I Engines.	CO1	7 Marks

UNIT-III

5	a)	Explain the measurement of brake power of I.C Engine by using rope brake dynamometer.	CO4	7 Marks
	b)	A four cylinder, four stroke diesel engines has brake mean effective pressure of 5.5 bar at full load speed of 600 r.p.m and specific fuel consumption of 0.25 kg/kWh. The cylinder has bore of 25cm and stroke length of 35cm. The air fuel ratio is measured as 26 from the exhaust gas analysis. The ambient conditions are 1 bar, 27^0C. Assuming the calorific value of fuel as 44 MJ/kg. Determine the brake thermal efficiency and the volumetric efficiency. Also find out brake power.	CO3	7 Marks
		(OR)		
6	a)	Define indicated power and how it can be determined experimentally for multi cylinder engine.	CO1	7 Marks
	b)	A six cylinder, gasoline engine operates on the four stroke cycle. The bore of each cylinder is 80mm and the stroke is 100mm. The clearance volume in each cylinder is 70cc. At a speed of 4000 r.p.m and the fuel consumption is 20 kg/h. The torque developed is 150 N-m. Calculate: i) the brake power. ii) the brake mean effective pressure. iii) brake thermal efficiency if the calorific value of the fuel is 43000 kJ/kg. iv) the relative efficiency if the ideal cycle for the engine is Otto cycle.	CO3	7 Marks

UNIT-IV

7	a)	How the exhaust and flue gas analysis carried out?	CO5	7 Marks
	b)	The percentage composition of sample of liquid fuel by weight is C = 84.8% and H_2 = 15.2%. Calculate: i) the weight of air needed for the combustion of 1Kg of fuel. ii) the volumetric composition of the products of composition, if 15% excess air id supplied.	CO4	7 Marks

(OR)

8	a)	What is the difference between Higher Heating Value (HHV) and Lower Heating Value (LHV) of the fuel?	CO1	7 Marks
	b)	One kg of octane (C_8H_{18}) is burned with 200% theoretical air. Assuming complete combustion determine. i) Air-fuel ratio. ii) Dew point of the products at a total pressure 100 kPa.	CO2	7 Marks

UNIT-V

9	a)	Define volumetric efficiency and explain the effect of clearance volume and pressure ratio on volumetric efficiency.	CO1	7 Marks
	b)	A single stage double acting air compressor running at 300 r.p.m, delivers 15m^3 of free air per minute at 700 kPa and 200^{0}C. If the clearance volume is 8% of swept volume and if the index of compression and expansion are same. Find the clearance swept volume of piston and volumetric efficiency. Initial air conditions are 10 kP and 15^{0}C.	CO2	7 Marks

(OR)

10	a)	Explain the working principle of single stage single acting reciprocating air compressor with the help of neat sketch.	CO1	7 Marks
	b)	A single-stage, double acting compressor has a free air delivery of 14 m^3/min, measured at 1.013 bar and 15^{0}C. The pressure and temperature in the cylinder during induction are 0.95 bar and 15^{0}C. The delivery pressure is 7 bar and index of compression and expansion is 1.3. The clearance volume is 5% of the swept volume. Calculate: (i) Indicated power required. (ii) Volumetric efficiency.	CO2	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

ANALOG COMMUNICATIONS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	The modulating signal in an AM system is a multiple-tone signal given by $m(t) = A_1 \text{ Cos } \omega_1 t + A_2 \text{ Cos } \omega_2 t + A_3 \text{ Cos } \omega_3 t$. The signal m(t) modulates carrier $A_c \text{ Cos } \omega_c t$. Plot the single-sided spectrum and find the bandwidth of the modulated signal. Assume that $\omega_3 > \omega_2 > \omega_1$ and $A_1 > A_2 > A_3$.	CO1	7 Marks
	b)	Draw and explain the circuit diagram of linear detector and derive the condition for choice of time constant.	CO1	7 Marks
		(OR)		
2	a)	Explain coherent detection of DSBSC modulated wave.	CO1	7 Marks
	b)	Considering the modulating and carrier waves as sinusoids, explain the single tone modulation of SSB wave with necessary expressions, wave-forms and spectrums. Find the percentage of power saved in SSB when compared with AM system.	CO5	7 Marks

UNIT-II

3	a)	Explain the principle of Angle Modulation. Derive and explain phase deviation, modulation index, frequency deviation and percent.	CO2	7 Marks
	b)	Design Armstrong FM generator for the generation of WBFM with frequency deviation 75 kHz and carrier frequency 100 MHz, with the narrow band carrier as 100 kHz and second carrier as 9.5 MHz, find the suitable multiplying factors. Assume the message signal is defined in the range 100-15 kHz.	CO4	7 Marks
		(OR)		
4	a)	With relevant expressions explain the demodulation of FM signals using phase locked loop.	CO1	8 Marks
	b)	Discuss the transmission bandwidth of FM waves.	CO2	6 Marks

UNIT-III

5	a)	Draw the AM receiver model and determine the SNR of the AM System.	CO2	7 Marks
	b)	Derive the figure of merit of DSB-SC.	CO2	7 Marks
		(OR)		
6	a)	What is pre-emphasis and de-emphasis and explain their operation.	CO2	9 Marks
	b)	Explain the threshold effect in frequency modulation.	CO2	5 Marks

UNIT-IV

7	a)	Classify radio transmitters based on the type of modulation and service.	CO1	7 Marks
	b)	In a broadcast super heterodyne receiver having an RF amplifier with quality factor of the antenna coupling circuit (at the input to the mixer) is 100. If the intermediate frequency is 455 kHz, calculate: i) The image frequency and its rejection ratio at 1000 kHz. ii) The image frequency and its rejection ratio at 25 MHz.	CO3	7 Marks
		(OR)		

8	a)	With the help of neat diagram, explain the working of the typical directly modulated FM transmitter.	CO2	7 Marks
	b)	Explain the following terms: i) Sensitivity. ii) Selectivity. iii) Image frequency and its rejection. iv) Fidelity of a super heterodyne receiver.	CO2	7 Marks

UNIT-V

9	a)	Explain the principle of PAM generation with a help of block diagram. Derive the mathematical expressions.	CO1	8 Marks
	b)	Write merits and demerits of PAM.	CO1	6 Marks

(OR)

10	a)	With a suitable circuit and waveforms, explain the generation and detection of PWM.	CO1	7 Marks
	b)	Compare PAM, PWM, PPM modulation schemes.	CO1	7 Marks

CODE No.: 16BT40402 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

DIGITAL IC APPLICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the following terms with reference to CMOS logic. i) Logic '0' and Logic '1'. ii) Noise margin. iii) Power supply rails. iv) Propagation delay.	CO1	7 Marks
	b)	Assess the characteristics of CMOS Dynamic Electrical **b**ehavior.	CO5	7 Marks
		(OR)		
2	a)	Reproduce basic ECL inverter/Buffer with its truth table. Also recognize the importance of ECL.	CO6	7 Marks
	b)	Elaborate Steady State Electrical behavior of CMOS logic.	CO1	7 Marks

UNIT-II

3	a)	Develop a flow chart for Verilog HDL design flow. Explain each step in detail.	CO3	7 Marks
	b)	Differentiate the basic description styles supported by Verilog HDL.	CO2	7 Marks
		(OR)		
4	a)	Assess the structural design elements of Verilog HDL with a suitable example.	CO2	7 Marks
	b)	Summarize the data types in Verilog HDL.	CO1	7 Marks

UNIT-III

5	a)	Draw the IC diagram of 74 x 999 adder and explain its operation.	CO1	7 Marks
	b)	Explain clearly about 74 x 148 priority encoder with its logic symbol. Give its truth table and write Verilog HDL code in any one of the model.	CO4	7 Marks
		(OR)		
6	a)	Implement 4 bit adder using 1 bit full adder and write Verilog HDL code for this implementation.	CO4	7 Marks
	b)	Design a 4-to-16 decoder using 74 x 138 ICs. Write the corresponding source code using module instantiation.	CO4	7 Marks

UNIT-IV

7	a)	Design a mod-129 counter using only two 74 x 163s and no additional gates.	CO6	7 Marks
	b)	Develop the flow chart for designing sequential logic.	CO3	7 Marks
		(OR)		
8	a)	Use 74 x 74IC to obtain 4-bit binary synchronous counter and develop Verilog HDL program for this logic using data flow style.	CO6	7 Marks
	b)	Design an 8-bit serial-in and parallel-out shift register with flip-flops. Explain the operation with the help of timing waveforms.	CO3	7 Marks

UNIT-V

9	a)	Suggest alternative ways of representing the ROM.	CO5	7 Marks
	b)	Write short notes on 2-D decoding commercial types-ROM.	CO1	7 Marks
		(OR)		
10	a)	Highlight the differences of PROM, EPROM and EEPROM technologies.	CO5	7 Marks
	b)	Outline the details of internal structure of 64K x 1 DRAM with the help of timing waveforms.	CO1	7 Marks

❀ ❀ ❀

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, March 2021

ELECTROMAGNETIC THEORY AND TRANSMISSION LINES

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define electric field strength. Derive an expression for electric field strength of an infinite line charge.	CO1	7 Marks
	b)	Two point charges -4μc and 5μc are located at (2,-1,3) and (0,4,-2) respectively. Find the potential at (1,0,1), 1f the zero potential is at infinity.	CO1	7 Marks
		(OR)		
2	a)	State Ampere's circuital law. Derive an expression for the magnetic field intensity of an infinite coaxial transmission line.	CO1	7 Marks
	b)	Given the magnetic vector potential $\mathbf{A}=-\rho^2/4\ \mathbf{a_z}$ Wb/m, calculate the total magnetic flux crossing the surface $\phi = \pi/2$, $1 \le \rho \le 2$m, $0 \le z \le 5$m.	CO1	7 Marks

UNIT-II

3	a)	Explain about transformer electromotive forces.	CO2	7 Marks
	b)	In free space, E=20 cos(wt-50x) a_y V/m. Calculate : i) Displacement current density. ii) Magnetic field intensity.	CO2	7 Marks
		(OR)		
4	a)	Discuss about the magnetic boundary conditions.	CO2	7 Marks
	b)	Given, $H_1=-2a_x+6a_y+4a_z$ A/m in region y-x-2≤0, where $\mu_1=5\mu_0$. Calculate b_2 in region y-x-2≥0, where $\mu=2\mu_0$.	CO2	7 Marks

UNIT-III

5	a)	State and explain Poynting's theorem.	CO6	7 Marks
	b)	A plane wave travelling in +y direction in a lossy medium ($\varepsilon_r=4,\mu_r=1,\sigma=10^{-2}$S/m) has E=30 cos($10^9\pi t+\pi/4$) a_z V/m at y=0. Find (i) E at y=1m, t=2ns (ii) H at y=2m, t=2ns.	CO4	7 Marks
		(OR)		
6	a)	Explain about Reflection of a plane wave at an oblique incidence.	CO5	7 Marks
	b)	In free space, **H**=0.2 cos (ωt-βx) $\mathbf{a_z}$A/m. Find the total power passing through a square plate of side 10cm on plane x+y=1.	CO4	7 Marks

UNIT-IV

7	a)	Derive the condition for a distortion less line.	CO6	7 Marks
	b)	A distortion less line has $Z_0=60\Omega,\alpha=20$mNP/m, phase velocity u=0.6C, where C is velocity of light in vacuum. Find R,L,G,C and λ at 100MHz.	CO1	7 Marks
		(OR)		
8	a)	Derive an expression for the input impedance of a transmission line.	CO6	7 Marks
	b)	A telephone line has R=30Ω/km, L=100mH/km, G=0 and C=20μF/km. At f=1KHz, calculate i) the characteristic impedance of the line ii) propagation constant and phase velocity.	CO1	7 Marks

UNIT-V

9	a)	Explain the significance of an infinite length line. Also explain about lossless lines.	CO1	7 Marks
	b)	A lossless 60Ω line with input impedance Z_{in}=120-j60Ω and load impedance Z_L=60+j60Ω. i) Find the reflection coefficient and VSWR at load. ii) Find the distance between load and generator.	CO6	7 Marks
		(OR)		
10	a)	Discuss about SC and OC lines and explain with their input impedances.	CO1	7 Marks
	b)	A 75Ω lossless line is to be matched to a load of 100-j80Ω with a shorted stub. Calculate the stub length, its distance from load and the necessary stub admittance.	CO6	7 Marks

CODE No.: 16BT40404 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

LINEAR IC APPLICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Discuss the pole-zero and dominant pole compensation techniques for an op amp.	CO1	7 Marks
	b)	What are the differences between the inverting and non-inverting terminals? What do you mean by the term "virtual ground"?	CO1	7 Marks
		(OR)		
2	a)	What are the characteristics of an ideal Op-Amp? Discuss in detail.	CO1	7 Marks
	b)	Discuss the AC characteristics of an Op-Amp.	CO1	7 Marks

UNIT-II

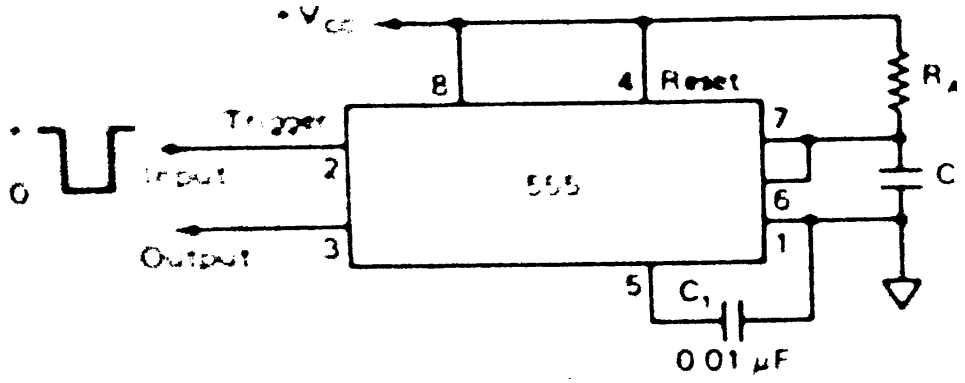
3	a)	Prove that an Op-Amp can be used to find the log of a given analog signal.	CO3	7 Marks
	b)	Analyze instrumentation amplifier circuit using op amp and discuss its applications.	CO2	7 Marks
		(OR)		
4	a)	Evaluate the time period of a free running astable multivibrator used as square wave generator using Op-Amp.	CO2	7 Marks
	b)	How does negative feedback affect the performance of an inverting amplifier?	CO2	7 Marks

UNIT-III

5	a)	Design a second order Butterworth high pass filter having lower cutoff frequency of 1KHz.	CO3	7 Marks
	b)	Differentiate between band pass and band reject filters.	CO1	7 Marks
		(OR)		
6	a)	Design a second order high pass filter with low cut off frequency 2KHz.	CO3	7 Marks
	b)	Explain the following filters. i) Notch filter. ii) Band pass filter.	CO1	7 Marks

UNIT-IV

7	a)	The monostable multivibrator in the below figure, is to be used as Divide-By-3. The frequency of input trigger is 12KHZ. If the value of C is 0.05μF, what should be the value of R_A ?	CO4	7 Marks



	b)	Realize the Schmitt trigger using a 555 timer IC.	CO5	7 Marks
		(OR)		

8	a)	For a free running oscillator using IC555, for R_A=6.8 KΩ, R_B=3.3 KΩ and C=0.5 μF, calculate: i) t_{high}. ii) t_{low}. iii) duty cycle. iv) oscillation frequency.	CO4	7 Marks
	b)	How a 555 timer can be used to realize square waveform generator of frequency 3 kHz and duty cycle 50%?	CO5	7 Marks

UNIT-V

9	a)	Draw the schematic of a DAC. Draw and explain the working principle of a weighted-resistor DAC.	CO1	7 Marks
	b)	Give the standard specifications of ADC with the normal values.	CO1	7 Marks
		(OR)		
10	a)	Compare R-2R and weight resistor types of DAC.	CO1	7 Marks
	b)	Explain the operation of a multiplying DAC and mention its applications.	CO1	7 Marks

❀ ❀ ❀

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

PROBABILITY AND STOCHASTIC PROCESS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain about joint and conditional probability.	CO1	6 Marks
	b)	Three regular dice are thrown. Assign probabilities to the following events: the sum of the points appearing on the three dice is. i) 4. ii) 9. iii) 15.	CO3	8 Marks
		(OR)		
2	a)	How do you explain statistically independent events using Baye's rule?	CO1	6 Marks
	b)	In a manufacturing process where glass products are produced, defects or bubbles occur, occasionally rendering the piece undesirable for marketing. It is known that, on average, 1 in every 1000 of these items produced has one or more bubbles. What is the probability that a random sample of 8000 will yield: i) Fewer than 7 items possessing bubbles. ii) None will possess a bubble. iii) Exactly 15 items possessing bubbles.	CO3	8 Marks

UNIT-II

3	a)	State and prove the properties of probability density function.	CO1	6 Marks
	b)	A continuous random variable X has a PDF $f_X(x)=3x^2$, $0 \le x \le 1$, Find 'a' and 'b' such that: i) $P\{X \le a\} = P\{x > a\}$. ii) $P\{x > b\} = 0.05$.	CO2	8 Marks
		(OR)		
4	a)	Define and explain the following distribution and densities with an application. i) Exponential. ii) Uniform.	CO1	6 Marks
	b)	In an experiment, a trial consists of four successive tosses of a coin. If we define a random variable as the number of heads appearing in a trial, determine the CDF, $F_X(x)$.	CO2	8 Marks

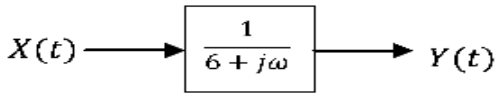
UNIT-III

5	a)	State and prove the joint density function properties.	CO1	6 Marks
	b)	If statistically independent random variables X and Y having respective densities $f_X(x) = 5\,u(x)\,e^{-5x}$, $f_Y(y) = 2\,u(y)\,e^{-2y}$ then derive the density function of W = X+Y.	CO2	8 Marks
		(OR)		
6	a)	Identify the value of moment μ_{22}, if statistically independent random variables X and Y have moments $m_{10} = 2$, $m_{20} = 14$, $m_{02} = 12$ and $m_{11} = -6$.	CO3	8 Marks
	b)	Explain about the monotonic transformation for a continuous random variable.	CO2	6 Marks

UNIT-IV

7	a)	A stationary random process X(t) with zero mean and autocorrelation $R_{xx}(\tau) = [e^{-2\|\tau\|}]$ is applied to a system of function $H(\omega) = \frac{1}{2 + j\omega}$ develop the PSD of output.	CO2	8 Marks
	b)	Derive the expression for mean and mean squared value of system response.	CO2	6 Marks

(OR)

8	a)	Define the terms: i) Random process. ii) Stationary random process. iii) Wide sense stationary random process. iv) Ergodic random process.	CO1	6 Marks
	b)	Consider a linear system as shown in figure:  $X(t)$ → $\frac{1}{6 + j\omega}$ → $Y(t)$ $X(t)$ is the input and Y(**t**) is the output of the system. The autocorrelation of $X(t)$ is $R_{xx}(\tau) = 5\delta(\tau)$ determine the PSD and autocorrelation.	CO2	8 Marks

UNIT-V

9	a)	Derive an expression for average noise figure of cascaded networks.	CO4	6 Marks
	b)	Calculate the r.m.s noise voltage generated in the bandwidth of 15 KHz, by a resistor of 2KΩ operating at 20^0C. Find the available noise power over this bandwidth. Find the noise PSD.	CO3	8 Marks

(OR)

10	a)	Two thermal resistors R_1 and R_2 at temperatures T_1 and T_2 are connected in series. Find the noise temperature of the combination. Find the noise temperature when $R_1 = R_2$.	CO4	7 Marks
	b)	Obtain an expression to find noise band width of the system.	CO4	7 Marks

CODE No.:16BT40406 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

PULSE AND DIGITAL CIRCUITS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

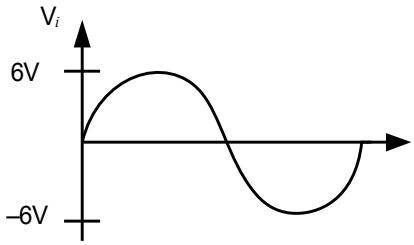
Answer One Question from each Unit
All questions carry equal marks

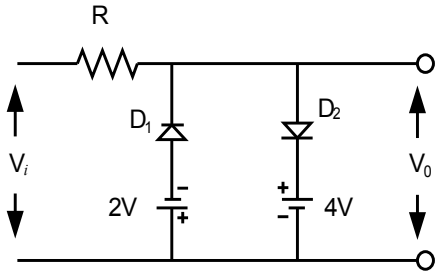
UNIT-I

1	a)	In an RC low pass circuit R=2 kΩ and C=1 μF. A square with half period of 5 μSec. is applied as input to this circuit. Determine the output waveform.	CO2	7 Marks
	b)	What is the function of an attenuator and explain any one application of it.	CO4	7 Marks
		(OR)		
2	a)	The limited ramp shown in figure is applied to an RC differentiator. Draw the output waveforms for the cases (i) T = 0.2 RC (ii) T = RC (iii) T = 5RC.	CO4	8 Marks
	b)	Why does a resistive attenuator need to be compensated? Explain different methods of compensation.	CO5	6 Marks

UNIT-II

3	a)	Determine V_0 for the network shown in figure for the given waveform. Assume ideal Diodes.	CO4	8 Marks





	b)	Draw the basic circuit diagram of negative peak clamper circuit and explain its operation.	CO1	6 Marks
		(OR)		
4	a)	Design a Clipper circuit for a sinusoidal input of 50V(P-P) which produces an output with double sided clipper with VR_1 = +7V and VR_2 = -10V and assume diodes are ideal.	CO3	8 Marks
	b)	Draw the basic circuit diagram of positive peak clamper circuit and explain its operation.	CO2	6 Marks

UNIT-III

5	a)	Design a transistor switch with the following data: V_{CC} = 12 V, V_{BB} = 6 V; Ic(sat) = 10mA; h_{FE}(min) = 40. Assume the junction voltages as V_{CE}(sat) = 0.3 V and V_{BE}(sat) = 0.7 V.	CO3	7 Marks
	b)	With the help of a neat circuit diagram and waveforms explain the working of Collector-coupled astable multivibrator.	CO2	7 Marks
		(OR)		
6	a)	Draw the neat circuit diagram of a collector – coupled monostable multivibrator and explain its operation with the help of waveforms.	CO1	8 Marks
	b)	Draw and explain about the response of Schmitt circuit for the following. i) for loop gain ≤1 ii) loop gain >1.	CO3	6 Marks

UNIT-IV

7	a)	Explain the basic principles of Miller and bootstrap time – base generators.	CO1	7 Marks
	b)	Write important applications of time-base circuits. With reference to time base circuits define the following terms: i) Fly back time. ii) Transmission error.	CO2	7 Marks

(OR)

8	a)	The specifications of UJT are given as $\eta = 0.6$ $V_v = 2V$, $R_{BB} = 5\ K\Omega$, $I_v = 1.5$ mA, $I_p = 8\ \mu A$ and $V_{BB} = 18$ V. Calculate the component values of the UJT Sweep circuit to generate an output sweep frequency of 10 KHz with sweep amplitude of 12 V.	CO4	8 Marks
	b)	What is meant by triggered sweep? What are the merits and demerits of triggered sweep circuits.	CO2	6 Marks

UNIT-V

9	a)	Draw and explain the operation of Bidirectional sampling gate.	CO1	7 Marks
	b)	Draw and explain the operation of ECL NOR/OR circuit.	CO1	7 Marks

(OR)

10	a)	Draw and explain Six-diode Bidirectional sampling gate.	CO1	7 Marks
	b)	Draw and explain CMOS Inverter.	CO1	7 Marks

CODE No.:16BT40501 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

COMPUTER GRAPHICS
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What is Cathode Ray Tube? Explain its usage.	CO1	7 Marks
	b)	Explain the working of Direct View Storage Tube.	CO1	7 Marks
		(OR)		
2	a)	Generate a Line between (12, 10) and (20, 18) using DDA algorithm.	CO3	7 Marks
	b)	Derive the equations for Ellipse generation.	CO3	7 Marks

UNIT-II

3	a)	Derive a transformation matrix for the Reflection with respect to a line passing through origin.	CO2	7 Marks
	b)	Explain the Scan Line polygon fill algorithm.	CO3	7 Marks
		(OR)		
4	a)	Illustrate the Associative property of 2D Transformations.	CO2	7 Marks
	b)	What is Homogenous coordinate? Explain.	CO1	7 Marks

UNIT-III

5	a)	Discuss the Sutherland-Hodgeman Polygon clipping algorithm with example.	CO2	10 Marks
	b)	Explain the B-Spline curves.	CO1	4 Marks
		(OR)		
6	a)	Explain the 2-D Viewing pipeline.	CO1	7 Marks
	b)	Explain the Bezier curves and surfaces.	CO5	7 Marks

UNIT-IV

7	a)	Explain basic 3-D Geometric Transformations.	CO2	7 Marks
	b)	Derive a composite matrix for 3-D Rotation with respect to an axis parallel to Y-axis.	CO2	7 Marks
		(OR)		
8	a)	Classify and explain the Parallel and perspective projections.	CO4	10 Marks
	b)	Explain the 3-D Viewing pipeline.	CO1	4 Marks

UNIT-V

9	a)	Explain the Depth sorting method.	CO5	7 Marks
	b)	Explain Area-subdivision and Octree methods.	CO5	7 Marks
		(OR)		
10	a)	Classify visible-surface detection algorithms.	CO5	4 Marks
	b)	List and explain the steps involved in Gouraud shading.	CO5	10 Marks

❀ ❀ ❀

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, March 2021

DATABASE MANAGEMENT SYSTEMS

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the drawbacks of conventional file processing system.	CO1	6 Marks
	b)	List and explain various database languages with examples.	CO1	8 Marks
		(OR)		
2		Explain the following: i) Entity set ii) Relationship set iii) Weak-entity set.	CO2	14 Marks

UNIT-II

3	a)	Discuss in detail about Entity set, Relationship set and different types of relationships.	CO2	8 Marks
	b)	List and explain about structural constraints of ER model.	CO2	6 Marks
		(OR)		
4	a)	What is relational algebra? How it is different from other relational languages? List out and explain different relational algebraic operations with example.	CO1	8 Marks
	b)	Differentiate TRC and DRC.	CO2	6 Marks

UNIT-III

5	a)	By considering an example describe various data update operations in SQL.	CO1	7 Marks
	b)	Write and explain the structure of SQL SELECT statement with suitable example.	CO1	7 Marks
		(OR)		
6	a)	Explain the need of normalization.	CO2	6 Marks
	b)	Describe 4NF and 5NF with suitable examples.	CO2	8 Marks

UNIT-IV

7	a)	Describe the properties of a transaction.	CO4	6 Marks
	b)	Define Serializability. What is the difference between conflict equivalence and view equivalence?	CO4	8 Marks
		(OR)		
8	a)	Explain about different types of failures occurred in the system.	CO1	7 Marks
	b)	Explain the concept of locking mechanism. State and explain two-phase locking protocol.	CO2	7 Marks

UNIT-V

9	a)	Describe various methods of defining indexes on multiple keys.	CO1	6 Marks
	b)	What is an index structure? Explain how to use hash table as an index structure for a database.	CO2	8 Marks
		(OR)		
10		Write short notes on: i) Hash based indexing; ii) B-trees.	CO2	14 Marks

❀ ❀ ❀

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

LINEAR AND DIGITAL ICS
[Electrical and Electronics Engineering; Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Using relevant expressions characterize all the **dc** and **ac** characteristics of an ideal OP-AMP.	CO5	14 Marks
		(OR)		
2	a)	Identify the limitations of an op-amp differential amplifier and derive the output voltage of an op-amp based differential amplifier.	CO5	7 Marks
	b)	Sketch the circuit diagram and explain the operation of an inverting amplifier.	CO1	7 Marks

UNIT-II

3	a)	Design a Integrator to integrate an I/P signal that varies in frequency from 1KHz to 10 KHz and plot the O/P wave forms if the I/P is a sine wave of1Vpeak at 1 KHz.	CO4	7 Marks
	b)	In a second-order high pass Butterworth filter C2 = C3 = 0.047μf, R2=R3= 3.3KΩ, R1 = 27 KΩ and RF=15.8 KW. Determine the low cutoff frequency fL of the filter	CO4	7 Marks
		(OR)		
4	a)	Determine the order of the Butterworth low-pass filter so that at w=1w3dB, the magnitude response is down by at least 20 dB.	CO3	7 Marks
	b)	Design a second order low pass filter for a cutoff frequency of 2KHz.	CO3	7 Marks

UNIT-III

5	a)	A 12-bit D to A converter has a full-scale range of 15 volts. Its maximum differential linearity error is ± 1/2 LSB. i) What is the percentage resolution? ii) What are the minimum and maximum possible values of the increment in its output voltage?	CO4	9 Marks
	b)	Distinguish between astable, monostable multivibrators.	CO2	5 Marks
		(OR)		
6	a)	Describe in detail the operation of a dual slope Analog to digital converter.	CO1	7 Marks
	b)	A PLL has a free running frequency of 500 KHz, the bandwidth of the LPF=10KHz. Will the PLL lock in if fi = 60 KHz? What is the frequency of the VCO outputs?	CO4	7 Marks

UNIT-IV

7	a)	Explain the following terms with reference to CMOS logic. i) Logic Levels. ii) DC Noise margin. iii) Power supply rails. iv) Propagation delay.	CO1	7 Marks
	b)	Asses the behavior of CMOS Inverter for LOW and HIGH outputs and sketch its equivalent resistive model.	CO6	7 Marks
		(OR)		
8	a)	Design CMOS transistor circuit for 2-input NOR gate. With the help of function table explain the circuit.	CO3	7 Marks
	b)	Design a CMOS transistor circuit that has the functional behaviour. f (X) = (A + B). (B + C).	CO4	7 Marks

UNIT-V

9	a)	Use appropriate structure to develop 8:1 Multiplexer using 2:1 multiplexer.	CO5	7 Marks
	b)	Write a verilog program for an edge triggered RS flip-flop.	CO4	7 Marks
		(OR)		
10	a)	Design a 4-bit binary synchronous counter using 74 x 74.	CO3	7 Marks
	b)	Design a module-10 counter using two 74 x 163 binary counters.	CO4	7 Marks

CODE No.: 16BT41041 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

COMPUTER ARCHITECTURE AND ORGANIZATION

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

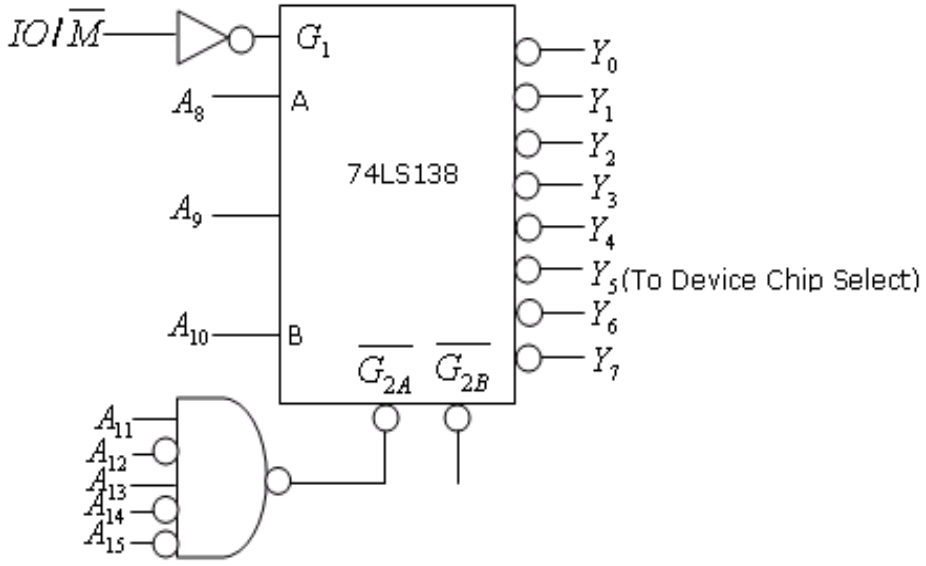
1	a)	On what parameters the computers are classified? Explain the types of computers with their applications.	CO1	7 Marks
	b)	Briefly explain about the functional units of a computer.	CO1	7 Marks
		(OR)		
2	a)	Explain the construction and working of one cell of DRAM and ROM.	CO1	7 Marks
	b)	Compare SRAM and DRAM.	CO2	7 Marks

UNIT-II

3	a)	Draw the timing diagram for the instruction ADI 35H. Analyze the sequence of operations involved in the execution of the said instruction.	CO2	10 Marks
	b)	The content of the Accumulator of 8085 processor is 56H. Write the steps to mask the lower nibble of Accumulator using suitable i) Arithmetic. ii) Logical instructions.	CO5	4 Marks
		(OR)		
4	a)	If the 8085 microprocessor adds the bytes 87H and 79H, specify the contents of the accumulator and the status of all the flags.	CO2	8 Marks
	b)	Discuss the following instructions of 8085 microprocessor. i) RIM. ii) SIM.	CO1	6 Marks

UNIT-III

5	a)	Differentiate vectored and non-vectored interrupts. Explain the interrupt handling mechanism of 8085.	CO1	8 Marks
	b)	For the interface shown below, show the address map of the device connected to Y5.	CO4	6 Marks



(OR)

6	a)	Explain the addressing modes of 8085 with at least two examples for each.	CO1	7 Marks
	b)	Write an assembly language program using 8085 instructions to cumulatively add eight bytes of data stored in eight consecutive memory locations.	CO5	7 Marks

UNIT-IV

7	a)	Construct a 4-bit bus with Three-sate buffers.	CO3	7 Marks
	b)	Design a one stage logic circuit to implement different logic functions.	CO3	7 Marks
		(OR)		
8	a)	Draw flow chart of instruction cycle.	CO5	7 Marks
	b)	Show how a micro operation is mapped to a micro instruction address.	CO1	7 Marks

UNIT-V

9	a)	Select the hardware required for performing signed magnitude addition and subtraction.	CO5	7 Marks
	b)	Differentiate between hardwired control and microprogrammed control. Is it possible to have a hardwired control associated with a control memory?	CO2	7 Marks
		(OR)		
10	a)	Develop an efficient algorithm perform binary multiplication using Booth algorithm.	CO5	7 Marks
	b)	"Pipelining increases speed of execution". Justify.	CO6	7 Marks

CODE No.: 16BT41201 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

DESIGN AND ANALYSIS OF ALGORITHMS
[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Prove that $2n^2 2^n + n \log n = \theta (n^2 2^n)$ is correct.	CO5	7 Marks
	b)	Solve the following recurrence relation: T(n) = 1, if n=1 or T(n) = T(n-1) + n(n-1), if n ≥ 2	CO4	7 Marks

(OR)

2	a)	Define pseudocode. Explain its significance with example.	CO1	7 Marks

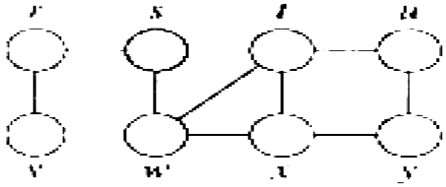
	b)	Evaluate the time complexity of the below pseudocode:
		Algorithm Sample
		{
		temp=1
		repeat {
		for i=1 to n
		{
		temp = temp + 1;
		n = n/2;
		}
		} until n <= 1 ;
		}
			CO4	7 Marks

UNIT-II

3	a)	Explain disjoint set operations with an example.	CO1	7 Marks
	b)	Outline UNION and FIND algorithms and calculate their time complexities.	CO3	7 Marks

(OR)

4	a)	Outline an algorithm of DFS and calculate its time complexity	CO2	7 Marks
	b)	Apply DFS algorithm for the following graph:	CO3	7 Marks

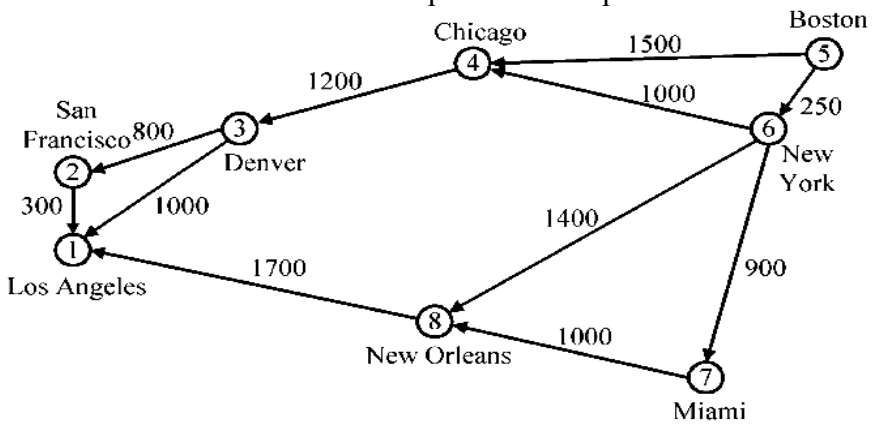


UNIT-III

5	a)	Outline the merge sort algorithm and calculate time complexity	CO4	7 Marks
	b)	Apply merge sort algorithm on the following elements 35, 57, 23, 2, 56, 68,10, 20, 65, 45	CO3	7 Marks

(OR)

6	a)	Distinguish divide and conquer and greedy algorithms. Illustrate with an example.	CO2	7 Marks
	b)	Consider the digraph given in the following figure. Estimate shortest paths from vertex 5 to other vertices. Explain each step in detail.	CO5	7 Marks



UNIT-IV

7	a)	What is the principle of dynamic programming? Explain with an example.	CO1	7 Marks
	b)	Explain briefly about any application of dynamic programming.	CO1	7 Marks
		(OR)		
8	a)	Let w = { 7, 4, 10, 23, 35, 20, 32} and m = 55. Find all possible subsets of w that sum to m. Draw the portion of the state space trees that is generated.	CO4	7 Marks
	b)	What is graph coloring? Outline an algorithm which finds m-coloring of a graph.	CO1, CO3	7 Marks

UNIT-V

9		Elaborate FIFO branch and bound solution with an example.	CO1	14 Marks
		(OR)		
10		Apply the branch-and-bound technique in solving the Traveling Salesman Problem. Explain with an example.	CO5	14 Marks

CODE No.:16BT41202 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

JAVA PROGRAMMING

[Computer Science and Engineering, Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Java is platform independent. Justify.	CO4	6 Marks
	b)	What are the different operators available in java?	CO1	8 Marks
		(OR)		
2	a)	Explain method overloading with example.	CO2	8 Marks
	b)	Write a program to perform the following functions using classes, objects and constructors wherever necessary. i) Read 5 subjects marks of 5 students. ii) Calculate the total and print the result on the screen.	CO5	6 Marks

UNIT-II

3	a)	Discuss about super keyword usage in inheritance with suitable programs.	CO2	8 Marks
	b)	What is abstract class? How it implemented in java?	CO2	6 Marks
		(OR)		
4	a)	What is interface? Explain its significance.	CO3	7 Marks
	b)	How multiple inheritance is implemented in java?	CO3	7 Marks

UNIT-III

5	a)	Explain with example, how we set priority to threads.	CO1	7 Marks
	b)	How to handle multiple catch blocks for a nested try block? Explain with an example.	CO5	7 Marks
		(OR)		
6	a)	Write a java program to implement producer consumer problem.	CO5	8 Marks
	b)	Explain various thread states and properties.	CO1	6 Marks

UNIT-IV

7	a)	Briefly explain about applet life cycle.	CO1	7 Marks
	b)	Illustrate about AWT class Hierarchy.	CO3	7 Marks
		(OR)		
8	a)	How to pass the parameters to an Applet? Explain with example.	CO1	6 Marks
	b)	Discuss about Java Collection Frame work.	CO2	8 Marks

UNIT-V

9	a)	Explain in detail about servlet Life cycle.	CO2	6 Marks
	b)	Discuss about Delegation event model with example.	CO5	8 Marks
		(OR)		
10	a)	Illustrate about servlet API.	CO3	7 Marks
	b)	Elucidate about MVC Architecture.	CO3	7 Marks

❀ ❀ ❀

CODE No.: 16BT41203 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

SOFTWARE ENGINEERING

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1		Explain the Nature of Software by defining the software and its application domains.	CO4	14 Marks
		(OR)		
2	a)	Identify the attributes of good software. Explain the key challenges facing in Software Engineering.	CO3	7 Marks
	b)	List out all the phases in the Unified Process Model.	CO1	7 Marks
		UNIT-II		
3	a)	List out the Process Activities of Requirements Elicitation and analysis with a neat sketch.	CO1	8 Marks
	b)	Explain six non–functional requirements which should be mentioned in the SRS documents	CO4	6 Marks
		(OR)		
4	a)	Discuss about: i) Elicitation. ii) Validation. iii) Management. iv) Documents.	CO5	8 Marks
	b)	Explain different types of checks should be carried out on the requirements in the requirements document.	CO4	6 Marks
		UNIT-III		
5		Compare the design steps involved in the transform mapping and transaction mapping.	CO4	14 Marks
		(OR)		
6	a)	Distinguish between a non-generative and a generative pattern.	CO2	7 Marks
	b)	How do architectural patterns differ from component patterns?	CO1	7 Marks
		UNIT-IV		
7		What is black box testing? Explain the different types of black box testing strategies with suitable examples.	CO1	14 Marks
		(OR)		
8	a)	Explain Software Testing strategies –The Big Picture in Software Testing.	CO1	6 Marks
	b)	List the Test-case design methods for object-oriented software.	CO1	4 Marks
	c)	Analyze two types of test strategies for object oriented software.	CO2	4 Marks
		UNIT-V		
9	a)	Explain in detail about Reactive and Proactive risk strategies.	CO1	4 Marks
	b)	What are the strategies develop to mitigate the risks in RMMM.	CO1	4 Marks
	c)	Contrast between Code Reconstructing and Data Reconstructing in Reengineering.	CO2	6 Marks
		(OR)		
10	a)	List out the targeted quality factors in software quality factors.	CO1	4 Marks
	b)	Discuss the ten guidelines for conducting formal technical Reviews.	CO5, CO6	10 Marks

❀ ❀ ❀

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

THEORY OF COMPUTATION

[Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define Finite Automaton and give its mathematical representation.	CO1	3 Marks
	b)	Design equivalent NFA for the following NFA with ε-transition, where q1 is an initial and also final state respectively,	CO3	7 Marks

	A	b	ε
- *q1	Φ	Φ	q2
q2	q3	q4	Φ
q3	Φ	q2	Φ
q4	Φ	Φ	q1

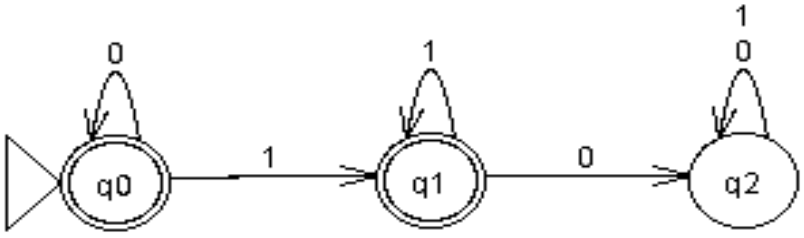
	c)	Differentiate between NFA and DFA.	CO2	4 Marks

(OR)

2	a)	Design an NFA for the set of all strings such that the third symbol from the right end is '1' over Σ= {0, 1}.	CO3	4 Marks
	b)	The following are two finite automata M1 ($Q1$, {0,1}, q0, δ1, {$q0$, $q1$}) and M2 ($Q2$, {0,1}, $p0$, $\delta2$, {$p2$}) corresponding to regular languages L1 and L2 with the transition functions given below. For machine M1, $\delta1(q0,0)=q1$, $\delta1(q0,1)=q0$, $\delta1(q1,0)=q2$, $\delta1(q1,1)=q0$, $\delta1(q2,0)=q2$, $\delta1(q2,1)=q2$, where $q0$ is an initial and a final state and $q2$ is a final state respectively. For machine ***M2***, $\delta2(p0,0)=p1$, $\delta2(p0,1)=p0$, $\delta2(p1,0)=p1$, $\delta2(p1,1)=p2$, $\delta2(p2,0)=p1$, $\delta2(p2,1)=p0$. Here $p0$ is an initial state and $p2$ is a final state. Draw transition diagram and transition table for L1 and L2.	CO2, CO3, CO5	10 Marks

UNIT-II

3	a)	Derive Regular-Expression for the following FA using R_{jj}^{K} notation.	CO3	10 Marks



	b)	Design NFA with Є- transitions for the following regular expressions, i) $b(a + b)^*a$. ii) (0 + 1) * (11 + 00).	CO3	4 Marks

(OR)

4	a)	Summarize the properties of regular expressions.	CO1	4 Marks
	b)	Is L = {Set of strings of equal number of *a's* and *b's*} Regular? Justify.	CO2	4 Marks
	c)	$L1$ and $L2$ are two regular sets. Justify the following. i) $L1$ Ω $L2$ is Regular. ii) $L1.L2$ is Regular. iii) $L1UL2$ is Regular.	CO2, CO5	6 Marks

UNIT-III

5	a)	Is the following CFG is ambiguous? $E \rightarrow E + E/E * E/(E)/id$. Justify your answer with valid example. Find equivalent unambiguous grammar.	CO4	7 Marks
	b)	When do you say that a CFG is Unambiguous? Is the following CFG is ambiguous or not? Justify your answer with an example. S $\rightarrow$ if E then S, $S \rightarrow$ if E then S else S, $E \rightarrow$ Other. Find an equivalent unambiguous CFG.	CO4, CO5	7 Marks

(OR)

6	a)	Define Useless symbol, Unit production and Null Production. Give examples.	CO1, CO5	7 Marks
	b)	Find an equivalent Reduced grammar from the following CFG. i) $S \rightarrow ABa/Bc$. ii) $A \rightarrow ac/Bcc$. iii) $B \rightarrow bcc$. iv) $C \rightarrow a$.	CO2, CO4	7 Marks

UNIT-IV

7	a)	What is the difference between PDA with empty stack and Final state?	CO2	5 Marks
	b)	Design PDA with Final state for the following language $L = \{a^m b^n / m>n\}$.	CO3	6 Marks
	c)	Define Instantaneous Description (ID) of PDA.	CO1	3 Marks

(OR)

8	a)	Is the following Language is NPDA or DPDA? Justify your answer $L = \{a^i b^j c^k / I > j$ or $j < k\}$.	CO2	7 Marks
	b)	Design PDA for the following language, $L = \{a^n b^m / m >= n$ & $m - n$ is even$\}$. Define all the elements of PDA.	CO1, CO3	7 Marks

UNIT-V

9	a)	Examine the formal definition of a TM to answer the following questions and explain with your reasoning. i) Can a TM ever write the blank symbol B on its tape? ii) Can the tape alphabet Γ be the same as input alphabet Σ? iii) Can a TM's head ever be in the same location in two successive steps? iv) Can a TM Contain just a single state?	CO5	8 Marks
	b)	Design TM for $L = \{a^n b^{2n} / n >= 1\}$.	CO3	6 Marks

(OR)

10	a)	Define Turing Machine and Construct a TM accepting the language, $L = \{a^n b^{m+n} c^m / m, n >= 1\}$.	CO1	7 Marks
	b)	Design a TM to compute m-n, where m and n are positive integers and $m > n$.	CO3	7 Marks

CODE No.: 19BT4HS01 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

BANKING AND INSURANCE

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

	UNIT-I				
1.	Explain the role of banks in transferring money from surplus to deficit.	12 Marks	L3	CO2	PO5 PO12
	(OR)				
2.	Elaborate the role of RBI in controlling the economic conditions of the Country.	12 Marks	L3	CO1	PO3 PO11
	UNIT-II				
3.	Explain the types of accounts and loans offered by banks.	12 Marks	L3	CO1	PO3
	(OR)				
4.	Explain the procedure of opening and closing an account**.**	12 Marks	L3	CO2	PO5 PO12
	UNIT-III				
5.	Elaborate on the various types of e-payment systems.	12 Marks	L3	CO1	PO3 PO11
	(OR)				
6.	Differentiate between B2C and B2B.	12 Marks	L3	CO2	PO3 PO5 PO12
	UNIT-IV				
7.	Elaborate the role of Insurance in minimizing risk.	12 Marks	L3	CO2	PO3 PO5 PO12
	(OR)				
8.	Explain the elements of Insurance.	12 Marks	L3	CO2	PO3 PO12
	UNIT-V				
9.	Outline the fundamental principles of insurance.	12 Marks	L3	CO1	PO3 PO11
	(OR)				
10.	According to insurance agreement, enlist the rights and responsibilities of insured.	12 Marks	L3	CO2	PO3 PO5 PO12

CODE No.: 19BT4HS02 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

BUSINESS COMMUNICATION AND CAREER SKILLS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the role of social media networks in business communication.	6 Marks	L4	CO1	PO1
	b)	Elaborate on the communication role of a manager.	6 Marks	L3	CO1	PO1
		(OR)				
2.		What are communication barriers in an organization and how do you overcome them?	12 Marks	L5	CO2	PO6
		UNIT-II				
3.	a)	How do you improve cross cultural communication in a global firm?	6 Marks	L3	CO2	PO6
	b)	Illustrate the use of communication in a business crisis.	6 Marks	L3	CO3	PO3
		(OR)				
4.		How do you use communication to be a responsible corporate citizen?	12 Marks	L3	CO1	PO6
		UNIT-III				
5.	a)	Advocate the need for effective business correspondence.	6 Marks	L3	CO3	PO5
	b)	List out the Common components of business letters.	6 Marks	L2	CO3	PO5
		(OR)				
6.		Discuss the important five stages of writing business messages.	12 Marks	L4	CO3	PO9
		UNIT-IV				
7.	a)	How do you create a video resume?	6 Marks	L2	CO3	PO10
	b)	Explain the need for follow-up letters after sending a resume.	6 Marks	L2	CO3	PO10
		(OR)				
8.		Discuss the need and process for online recruitment to tap global talent.	12 Marks	L3	CO1	PO5
		UNIT-V				
9.	a)	Suggest important preparation tips for conducting interviews.	6 Marks	L3	CO4	PO5
	b)	How do you plan to use different types of questions in interview process?	6 Marks	L6	CO4	PO1
		(OR)				
10.		How do you use different styles of interviewing in selecting executive cadres?	12 Marks	L4	CO4	PO6

CODE No.: 19BT4HS03 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

COST ACCOUNTING AND FINANCIAL MANAGEMENT

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the meaning of Cost and Cost Accounting.	6 Marks	L1	CO1	PO1
	b)	Discuss the Objectives of Cost Accounting.	6 Marks	L3	CO2	PO5
		(OR)				
2.	a)	Explain the meaning of Management Accounting and how it is different from Cost Accounting.	6 Marks	L1	CO1	PO2 PO3
	b)	Discuss the Material and Labour element of Cost Control.	6 Marks	L3	CO2	PO3

UNIT-II

3.	a)	Explain the importance of Costing.	6 Marks	L1	CO1	PO2
	b)	Illustrate the preparation of Cost sheet.	6 Marks	L3	CO2	PO3
		(OR)				
4.	a)	Analyse different types of costs.	6 Marks	L1	CO1	PO1
	b)	Explain how you estimate tender price.	6 Marks	L3	CO2	PO3

UNIT-III

5.	a)	Define Standard Costing with a suitable example.	6 Marks	L1	CO1	PO2
	b)	From the following information, calculate Material Cost variance **Standards** Materials for 70kg of Finished goods 100kgs Price 1/- per kg **Actuals** Output 2,10,000 kgs Material Used 2,80,000 kgs Cost of Materials 2,52,000/-	6 Marks	L3	CO2	PO2
		(OR)				
6.	a)	Explain about Material variances. How do you calculate?	6 Marks	L1	CO1	PO3
	b)	From the following information, calculate Direct Labour cost variance: Standard wage rate per hour : Rs. 5 Standard time set : 1000 hours Actual wage rate per hour : Rs. 6 Actual time taken : 980 hours	6 Marks	L3	CO2	PO5

UNIT-IV

7.	a)	Explain the meaning of financial Management and its importance	6 Marks	L1	CO1	PO4
	b)	Discuss different types of Ratios in analyzing the financial statements.	6 Marks	L3	CO2	PO2

(OR)

8.	a)	Explain Capital Budgeting decision of Financial Management.	6 Marks	L1	CO1	PO4
	b)		6 Marks	L3	CO2	PO2

Liabilities	Rs	Assets	Rs
Share capital	2,00,000	Land & Building	1,40,000
Profit & Loss a/c	30,000	Plant & Machinery	3,50,000
General reserve	40,000	Stock	2,00,000
12% Debentures	4,20,000	Debtors	1,00,000
Creditors	1,00,000	Bills Receivable	10,000
Bills Payable	50,000	Cash at Bank	40,000
TOTAL	**8,40,000**		**8,40,000**

Calculate:

i. Current Ratio.
ii. Quick Asset Ratio.
iii. Debt to Equity Ratio.

UNIT-V

9.	a)	Explain the meaning and importance of Investment.	6 Marks	L1	CO1	PO4
	b)	Discuss the objectives of Investments.	6 Marks	L3	CO2	PO4

(OR)

10	a)	Explain the concept of Risk and Return.	6 Marks	L1	CO1	PO2
.	b)	Discuss the Capital Budgeting Techniques.	6 Marks	L3	CO2	PO2 PO6

CODE No.: 19BT4HS10 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

PERSONALITY DEVELOPMENT

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		Classify different types of personalities briefly.	12 Marks	L2	CO3	PO1
		(OR)				
2.	a)	"Self-awareness is the key in personality development." Justify the given statement.	6 Marks	L5	CO1	PO1
	b)	Explain the key leadership traits that originate from one's personality.	6 Marks	L2	CO1	PO9
		UNIT-II				
3.	a)	Discuss the various dimensions of self-image.	6 Marks	L2	CO2	PO9
	b)	Illustrate the strategies for building self-confidence.	6 Marks	L3	CO1	PO9
		(OR)				
4.	a)	Explain the role of feedback in self-development.	6 Marks	L2	CO1	PO10
	b)	Differentiate Mentoring and Counseling.	6 Marks	L4	CO3	PO10
		UNIT-III				
5.	a)	Discuss the significance of attitude in understanding the personality of an individual.	6 Marks	L2	CO2	PO2
	b)	Distinguish between attitude and behavior.	6 Marks	L4	CO2	PO2
		(OR)				
6.		"Is it really possible to change negative attitude of a person?" Support your answer.	12 Marks	L5	CO2	PO2
		UNIT-IV				
7.		Illustrate different leadership styles.	12 Marks	L3	CO3	PO11
		(OR)				
8.	a)	"Open communications in organizations build trust." Comment.	6 Marks	L4	CO1	PO10
	b)	Identify different ways through which a manager communicates performance expectations to employees.	6 Marks	L2	CO1	PO10
		UNIT-V				
9.		Explain the significance of time management in real life using suitable examples.	12 Marks	L2	CO4	PO5
		(OR)				
10.	a)	Differentiate Ethics and Self-Righteousness.	6 Marks	L4	CO2	PO8
	b)	"Being practical is the need of the hour." Defend the Statement.	6 Marks	L5	CO4	PO8

CODE No.: 19BT4HS11 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

PROFESSIONAL ETHICS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the scope and aims of Engineering Ethics.	6 Marks	L1	CO1	PO1
	b)	Explain the moral problems in engineering.	6 Marks	L2	CO3	PO8
		(OR)				
2.		Explain what moral autonomy is and bring out the difference between moral autonomy and moral absolutism.	12 Marks	L2	CO3	PO8
		UNIT-II				
3.	a)	Explain the term 'professional accountability' with examples.	6 Marks	L4	CO1	PO1
	b)	Discuss the following: i) Integrity, Self Respect. ii) Customs and religions.	6 Marks	L4	CO1	PO1
		(OR)				
4.		Explain briefly the terms 'profession' and 'professional' with suitable examples.	12 Marks	L2	CO1	PO2
		UNIT-III				
5.	a)	Define 'conscientiousness' with suitable case illustrations	6 Marks	L2	CO1	PO1
	b)	Write short notes on the following : i) Engineers as responsible experimenters. ii) Moral autonomy and accountability.	6 Marks	L2	CO2	PO2
		(OR)				
6.		Discuss the necessary Industrial standards and code of ethics to be followed at workplace by engineers.	12 Marks	L2	CO1	PO1
		UNIT-IV				
7.	a)	What is meant by 'discrimination' and give an example?	6 Marks	L2	CO1	PO1
	b)	Differentiate between Collective Bargain and Conflict of Interest.	6 Marks	L2	CO1	PO1
		(OR)				
8.		Discuss the following: i) Professionalism. ii) Moral Status. iii) Professional Rights and Responsibilities.	12 Marks	L4	CO2	PO2
		UNIT-V				
9.		Explain the role of ethics in MNC's and their rights.	12 Marks	L2	CO3	PO8
		(OR)				
10.		Explain the following in detail with illustrations. i) Necessity of Moral leadership. ii) Intellectual Property Rights.	12 Marks	L2	CO1	PO1

CODE No.: 19BT30403 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

SIGNALS AND SYSTEMS

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Determine the value of power and energy of the following signals. i) $e^{-2t}\mathbf{u}(t)$ ii) $\cos(\pi/4)n$	6 Marks	L1	CO1	PO3
	b)	Find the convolution of signals x(n) = [……,1,1,1,1,0,0,…..] and h(n) = a^n for $0 \le n \le 6$ and zero elsewhere.	6 Marks	L1	CO1	PO2
		(OR)				
2.	a)	Which of the following signals are periodic? Find the fundamental period, if periodic. i) $3\cos(4t+\pi/3)$ ii) $\cos(\pi/8)n^2$	6 Marks	L1	CO1	PO2
	b)	Find the response of an LTI system with input $x(n) = a^n u(n)$ and impulse response h(n) = u(n).	6 Marks	L1	CO1	PO2

UNIT-II

3.	a)	Describe the Fourier series representation of continuous time periodic signals as a linear combination of harmonically related complex exponentials.	6 Marks	L2	CO2	PO1
	b)	Bring out the properties of Discrete Time Fourier transform with proof.	6 Marks	L2	CO2	PO3
		(OR)				
4.	a)	Determine the Fourier series coefficients for the periodic signals x(t) = cos(4πt) and y(t) = sin(4πt).	8 Marks	L2	CO2	PO5
	b)	Prove time reversal and time shifting properties of Fourier Transform.	4 Marks	L2	CO2	PO1

UNIT-III

5.	a)	Calculate the cross correlation between unit impulse and unit step functions.	6 Marks	L3	CO3	PO2
	b)	Describe the properties of auto correlation function.	6 Marks	L3	CO3	PO1
		(OR)				
6.	a)	Show that the power spectral density of the auto correlation function defined by $R_{xx}(\tau) = 1 - \lvert\tau\rvert$ for $-1 \le \tau \le 1$ $= 0$ Elsewhere Is a $[\text{sinc}(f)]^2$	8 Marks	L3	CO3	PO4
	b)	State Parseval's theorem.	4 Marks	L3	CO3	PO1

UNIT-IV

7.	a)	Give the relationship between Laplace Transform and Fourier Transform.	4 Marks	L4	CO4	PO1
	b)	Find the Laplace Transform of the following signals and plot the ROC. i) Impulse. ii) Unit Step. iii) $A\text{Sin}(\omega t)u(t)$	8 Marks	L4	CO4	PO2
		(OR)				

8.	a)	Find the Laplace Transform of $x(t) = e^{-at}u(t)$ and sketch its ROC.	4 Marks	L4	CO4	PO3
	b)	Find the Inverse Laplace Transform of the following: i) $X(S) = (s+2)/s^2+7s+12$ ii) $X(S) = (s-3)/(s^2+4s+13)$	8 Marks	L4	CO4	PO5
		UNIT-V				
9.	a)	Illustrate the proof of sampling theorem for low pass signals.	4 Marks	L5	CO5	PO2
	b)	Determine Nyquist sampling rate and Nyquist sampling interval for the following signals. i) $x(t) = 2\text{sinc}(100\pi t)$ ii) $x(t) = \text{sinc}(80\pi t) \times \text{sinc}(120\pi t)$	8 Marks	L5	CO5	PO5
		(OR)				
10.	a)	Explain the Impulse and Flat to sampling methods.	6 Marks	L5	CO5	PO1
	b)	What is Aliasing Effect and how it can be nullified.	6 Marks	L5	CO5	PO2

CODE No.: 19BT31202 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

SOFTWARE ENGINEERING

[Computer Science and Engineering, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Discuss manager's myths about software development and their effect on the practitioners as well as on overall outcome.	6 Marks	L2	CO1	PO1
	b)	List out the best practices of agile process and principles.	6 Marks	L1	CO1	PO2
		(OR)				
2.	a)	Elaborate the work flow of spiral model with a neat diagram.	6 Marks	L2	CO1	PO2
	b)	Identify the steps in scrum process flow in agile software development.	6 Marks	L3	CO1	PO2
		UNIT-II				
3.	a)	Illustrate about functional requirements and non-functional requirements.	6 Marks	L2	CO2	PO1
	b)	Interpret about requirements management process in an organization to deliver a software product.	6 Marks	L3	CO2	PO3
		(OR)				
4.	a)	Elaborate the concept of scenario-based modeling.	6 Marks	L2	CO2	PO3
	b)	Model a swimlane diagram for access camera surveillance through the internet in safe home security system.	6 Marks	L3	CO2	PO3
		UNIT-III				
5.	a)	Model a use case diagram for library management system to identify various types of actors, use cases and their relationships between them.	6 Marks	L3	CO3	PO2
	b)	Analyze the difference between process and project metrics in software engineering process.	6 Marks	L1	CO3	PO1
		(OR)				
6.	a)	Model a sequence and collaboration diagrams for withdrawing an amount from ATM.	6 Marks	L3	CO3	PO2
	b)	Illustrate about measures of software quality in an organization.	6 Marks	L1	CO3	PO1
		UNIT-IV				
7.	a)	Discuss about unit testing and integration testing.	6 Marks	L2	CO4	PO2
	b)	Differentiate between black box testing and white box testing.	6 Marks	L3	CO4	PO2
		(OR)				
8.	a)	Describe the concept of art of debugging with a neat diagram.	6 Marks	L2	CO4	PO2
	b)	Interpret about test cases and class hierarchy of object-oriented methods with an example.	6 Marks	L3	CO4	PO2
		UNIT-V				
9.	a)	Discuss about risk mitigation monitoring and management.	6 Marks	L3	CO5	PO5
	b)	Compare and contrast between McCall's quality factor and ISO 9126 quality factor in Software Quality Factors.	6 Marks	L3	CO5	PO1
		(OR)				
10.	a)	Identify the steps for implementing business process reengineering model.	6 Marks	L2	CO5	PO2
	b)	Illustrate about reverse engineering process to understand internal design structure of complex systems.	6 Marks	L2	CO5	PO2

CODE No.: 19BT31502 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

OPERATING SYSTEMS
[Information Technology]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain Inter Process Communication.	6 Marks	L2	CO1	PO1
	b)	Explain operating system structure with neat block diagram.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	What is Scheduling? Explain Multiprocessor Scheduling.	6 Marks	L2	CO1	PO2
	b)	Discuss about Layered approach.	6 Marks	L2	CO1	PO3
		UNIT-II				
3.	a)	Explain Synchronization Hardware.	6 Marks	L2	CO2	PO2
	b)	Discuss about System Model.	6 Marks	L2	CO2	PO2
		(OR)				
4.		Explain:	12 Marks	L2	CO3	PO3
		i) Deadlock.			CO2	PO2
		ii) Semaphores.			CO3	PO1
		iii) Deadlock avoidance.			CO2	PO5
		iv) Monitors.				
		UNIT-III				
5.	a)	Explain the mass storage structure.	6 Marks	L2	CO4	PO5
	b)	Discuss about contiguous allocations.	6 Marks	L2	CO4	PO3
		(OR)				
6.	a)	Explain Demand Paging.	6 Marks	L2	CO4	PO2
	b)	Discuss about Trashing.	6 Marks	L2	CO4	PO3
		UNIT-IV				
7.	a)	Explain File Access Methods.	6 Marks	L2	CO5	PO1
	b)	Discuss about I/O hardware.	6 Marks	L2	CO6	PO4
		(OR)				
8.		Explain:	12 Marks	L2	CO5	PO1
		i) Directory Implementation.			CO5	PO2
		ii) File system implementation.			CO6	PO4
		iii) I/O interface.				
		UNIT-V				
9.	a)	Discuss about Domain of protection.	6 Marks	L2	CO5	PO2
	b)	Explain user authentication.	6 Marks	L2	CO6	PO2
		(OR)				
10.	a)	Explain Access Control.	6 Marks	L2	CO5	PO2
	b)	Discuss about Firewalling to Protect Systems and Networks.	6 Marks	L2	CO6	PO1

CODE No.: 19BT40101 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

ENGINEERING HYDROLOGY

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	List and discuss types of precipitation briefly.	6 Marks	L2	CO1	PO1
	b)	Differentiate between recording and non-recording rain gauge and explain weighing bucket with a neat sketch.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Explain mass curve and hyetograph with figure.	6 Marks	L2	CO1	PO4
	b)	There are four rain gauge stations existing in the catchment of a river. The average annual rainfall values of these stations are 810, 630, 410 and 550 mm respectively. For a 10% error in the estimation of the mean rainfall, calculate the optimum number of stations in the catchment.	6 Marks	L4	CO1	PO5

UNIT-II

3.	a)	Define infiltration and discuss different factors affecting infiltration process.	6 Marks	L2	CO2	PO2
	b)	Discuss the following terms briefly. i) Hyetograph and ii) Double mass curve.	6 Marks	L2	CO2	PO2
		(OR)				
4.	a)	A storm produced rainfall intensities of 7, 18, 25, 12, 10, and 3 mm/r in successive one-hour intervals over a basin of 800 sqkm. The resulting runoff is observed to be 2640 hectare-m. Determine the Φ index of the basin.	6 Marks	L4	CO2	PO5
	b)	Discuss area velocity method to calculate discharge of stream.	6 Marks	L2	CO2	PO4

UNIT-III

5.	a)	A 30cm well fully penetrates in an unconfined aquifer of 25m saturated depth. When a discharge of 2100 lpm was being pumped for a long time, observation wells at a radial distance 30m and 90m indicated drawdown of 5m and 4m respectively. Estimate the coefficient of permeability and transmissibility of the aquifer.	6 Marks	L4	CO3	PO2
	b)	Discuss briefly about ground water and different forms of saturated formations in sub-surface of the earth.	6 Marks	L2	CO3	PO4
		(OR)				
6.	a)	Derive an expression for discharge from a well fully penetrating a confined aquifer under steady state flow.	6 Marks	L4	CO3	PO5
	b)	List the different types of aquifers and explain them briefly.	6 Marks	L2	CO3	PO2

UNIT-IV

7.	a)	Draw and explain a single peaked hydrograph with its components.	6 Marks	L2	CO4	PO4
	b)	Given the ordinates of a 4-h unit hydrograph as below. Derive the ordinates of a 12-h unit hydrograph for the same catchment using method of superposition.	6 Marks	L6	CO4	PO7

Time (h)	0	4	8	12	16	20	24	28	32	36	40	44
Ordinate of 4h UH	0	20	80	130	150	130	90	52	27	15	5	0

(OR)

8.	a)	Describe the most commonly used two methods for routing of floods through reservoir and differentiate channel routing and reservoir routing.	6 Marks	L4	CO5	PO2
	b)	Discuss rational methods for estimation of peak discharge for a watershed.	6 Marks	L2	CO5	PO4

UNIT-V

9.	a)	Discuss about reservoir sedimentation and different measure to control sedimentation.	6 Marks	L2	CO6	PO2
	b)	Distinguish universal soil loss equation and modified universal soil loss equation for the estimation of soil erosion.	6 Marks	L2	CO6	PO4

(OR)

10.	a)	Discuss erosion and reservoir sedimentation problems in India.	6 Marks	L2	CO6	PO4
	b)	Discuss trap efficiency and mention various factors affecting trap efficiency in reservoir.	6 Marks	L2	CO6	PO7

CODE No.: 19BT40102 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

ENVIRONMENTAL ENGINEERING

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Draw a typical reservoir intake and describe various parts.	6 Marks	L1	CO1	PO1
	b)	Compute the population using arithmetic, geometric and incremental increase methods for the decades 2031 and 2041, if a town had the population 1,20,000; 2,10,000; 2,70,000; 3,20,000; and 4,10,000 at the end of 1981, 1991, 2001, 2011 and 2021 respectively as per the census records.	6 Marks	L3	CO1	PO1 PO2 PO3 PO4 PO5
		(OR)				
2.	a)	Describe biological characteristics of surface and subsurface water sources.	6 Marks	L2	CO1	PO1 PO2
	b)	What are points should be kept in mind while selecting a site for intake structure?	6 Marks	L2	CO1	PO1 PO2 PO7
		UNIT-II				
3.	a)	Prove that the settling of particles is independent of depth of sedimentation tank.	6 Marks	L4	CO2	PO1 PO2
	b)	Design a rectangular sedimentation tank for a town of population 40,000 and compute surface overflow rate. Assume the average water supply per head per day as 135 litres and detention time as 2 hrs with liquid depth in the tank as 2m. Take L/B ratio as 4:1.	6 Marks	L3	CO2	PO1 PO2 PO3 PO4 PO6 PO8 PO10
		(OR)				
4.	a)	Briefly explain the coagulation process in water treatment. List out types of coagulants used in water treatment plant.	6 Marks	L3	CO2	PO1 PO2 PO3 PO4 PO6 PO8 PO10
	b)	Design rapid sand filter for treating 1.0 MLD water. Assume filtration rate as 2500 L/m^2/hr.	6 Marks	L4	CO2	PO1 PO2 PO4 PO6 PO10
		UNIT-III				
5.	a)	Enlist the objectives of sewerage works and types of sewerage systems.	6 Marks	L1	CO3	PO1
	b)	Give various empirical formulae for the determining storm water flow in sewers. Explain their applicability or suitability.	6 Marks	L2	CO3	PO1 PO2
		(OR)				

6.	a)	List out the different types of sewerage systems. Describe the merits and demerits of the sewerage system preferred in India.	6 Marks	L2	CO3	PO1 PO2 PO5 PO6
	b)	A 300mm diameter sewer is to flow at 0.3 depth on a grade ensuring a degree of self cleansing equivalent to that obtained at full depth at a velocity of 0.9 m/sec. Find the required grade and associated velocity and rate of discharge at this depth. Assume Manning's rugosity coefficient n = 0.013. The variation of **n** with depth may be neglected.	6 Marks	L3	CO3	PO1 PO2 PO4 PO5 PO6 PO8
		UNIT-IV				
7.	a)	Explain design criteria of construction operation of UASB process.	6 Marks	L2	CO4	PO1 PO2 PO5 PO10
	b)	Design a suitable rectangular sedimentation tank (provided with mechanical cleaning equipment) for treating the sewage from a city, provided with an assured public water supply system, with a maximum daily demand of 12 million litres per day. Assume suitable values of detention period and velocity of flow in the tank. Make any other assumptions, wherever needed.	6 Marks	L2	CO4	PO1 PO2 PO5 PO10 PO12
		(OR)				
8.	a)	Explain sludge digestion and its stages in digestion process. Also explain factors affecting sludge digestion.	6 Marks	L2	CO4	PO1 PO2
	b)	Develop a relation between a diameter, if circular section of a sewer and a side of the rectangular sewer section having width as twice its depth, the tree sides being wetted. Two sewers are to be hydraulically equivalent.	6 Marks	L3	CO4	PO1 PO2 PO3 PO5 PO6 PO8 PO10
		UNIT-V				
9.	a)	Design a septic tank for a hostel housing 150 persons. Also design the soil absorption system for the disposal of the septic tank effluent, assuming the percolation rate as 20 minutes per cm.	6 Marks	L3	CO5	PO1 PO2 PO3 PO5 PO6 PO10
	b)	Describe about the two-pipe sanitary plumbing systems normally provided in the buildings compare the merits and demerits of this system.	6 Marks	L4	CO5	PO1 PO2 PO10
		(OR)				
10.	a)	What is the purpose of sludge digestion in sewage treatment? Describe various stages of sludge digestion in an anaerobic digester and the characteristic and final method of disposal of the digested sludge.	6 Marks	L2	CO5	PO1 PO2 PO5 PO6 PO8
	b)	What are different methods for solid waste collection and disposal? Explain clearly.	6 Marks	L6	CO5	PO1 PO2 PO4 PO5 PO6 PO8

CODE No.: 19BT40103 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

HYDRAULIC ENGINEERING

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Describe boundary layer concept.	6 Marks	L1	CO1	PO1
	b)	A plate of 600mm length and 400mm wide is immersed in a fluid of specific gravity 0.9 and kinematic viscosity of 10^{-4} m^2/s. The fluid is moving with a velocity of 6 m/s. Determine the boundary layer thickness.	6 Marks	L4	CO1	PO1 PO2
		(OR)				
2.	a)	Explain boundary conditions for the velocity profiles.	6 Marks	L2	CO1	PO1
	b)	Derive equation for momentum thickness.	6 Marks	L3	CO1	PO1 PO2
		UNIT-II				
3.	a)	Describe specific energy with diagram.	6 Marks	L1	CO2	PO1
	b)	Water flow in a wide rectangular channel of concrete (n = 0.014) laid at a slope of 1 in 900. Determine the depth of flow and the unit discharge for the flow to take place in critical condition.	6 Marks	L4	CO2	PO1 PO2
		(OR)				
4.	a)	Explain critical, sub-critical and super-critical flow.	6 Marks	L2	CO2	PO1
	b)	Classify water profiles with description.	6 Marks	L3	CO2	PO1 PO2
		UNIT-III				
5.	a)	Describe the force exerted by a jet on stationary inclined plate.	6 Marks	L1	CO3	PO1
	b)	A jet of water of diameter 10cm strikes a flat plate normally with a velocity of 15 m/s. The plate is moving with a velocity of 6 m/s in the direction of the jet and away from the jet. Find the work done by the jet on the plate per second.	6 Marks	L4	CO3	PO1 PO2
		(OR)				
6.	a)	Explain the force exerted by a jet of water on series of vanes.	6 Marks	L2	CO3	PO1
	b)	A jet of water of diameter 75mm moving with a velocity of 25 m/s strikes a fixed plate in such a way that the angle between the jet and plate is 60^o. Find the force exerted by the jet on the plate in the direction normal to the plate.	6 Marks	L3	CO3	PO1 PO2
		UNIT-IV				
7.	a)	Describe turbine and its classification.	6 Marks	L1	CO4	PO1
	b)	An inward flow reaction turbine has external and internal diameter as 1m and 0.5m respectively. The velocity of flow through the runner is constant and is equal to 1.5 m/s. Determine the discharge through the runner, and width of the turbine at outlet if the width of the turbine at inlet = 200mm.	6 Marks	L4	CO4	PO1 PO2
		(OR)				
8.	a)	Explain axial flow reaction turbine with diagram.	6 Marks	L2	CO4	PO1
	b)	A turbine develops 7225 kW power under a head of 25m at 135 r.p.m. Calculate the specific speed of the turbine.	6 Marks	L3	CO4	PO1 PO2

UNIT-V

9.	a)	Describe priming and cavitation in pump.	6 Marks	L1	CO5	PO1
	b)	The diameter of a centrifugal pump, which is discharging 0.03 m^3/s of water against a total head of 20m is 0.40m. The pump is running at 1500 r.p.m. Find the head, discharge for a geometrically similar pump of diameter 0.25m when it is running at 3000 r.p.m.	6 Marks	L4	CO5	PO1 PO2 PO3
		(OR)				
10.	a)	Explain multistage centrifugal pump and negative slip in reciprocating pump.	6 Marks	L2	CO5	PO1
	b)	Derive expression for specific speed of centrifugal pump.	6 Marks	L3	CO5	PO1 PO2

CODE No.: 19BT40104 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

SOIL MECHANICS

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	A fine grained soil has 60% (by weight) clay content. The soil behaves as semi-solid when the water content is between 15% and 28%. The soil behaves fluid-like when the water content is more than 40%. What is the Activity of Soil?	6 Marks	L1	CO1	PO1 PO2
	b)	If the water content of a fully saturated soil mass is 100%, what will be the relation between void ratio and specific gravity of soil?	6 Marks	L2	CO1	PO1 PO2
		(OR)				
2.	a)	In its natural condition, a soil sample has a mass of 1.980 kg and a volume of 0.001 m^3. After being completely dried in an oven, the mass of the sample is 1.800 kg. Specific gravity is 2.7, Unit weight of water is 10 kN/m^3. What is the degree of saturation?	6 Marks	L3	CO1	PO1 PO2 PO8
	b)	The laboratory test results of a soil sample are given below: Percentage finer than 4.75 mm = 60, percentage finer than 0.075 mm = 30, liquid limit=35%, Plastic limit = 27%, Classify the soil as per IS1478:1970.	6 Marks	L4	CO1	PO1 PO2

UNIT-II

3.	a)	A soil has a discharge velocity of 3×10^{-7} m/s and void ratio of 0.5. What is the seepage velocity?	6 Marks	L1	CO2	PO1
	b)	If during a permeability test on a soil sample with a falling head permeameter equal time intervals are noted for a drop of head from L_1 and L_2 and against L_2 and L_3. What will be the relation between L_1, L_2, and L_3?	6 Marks	L4	CO2	PO1 PO2
		(OR)				
4.	a)	The flow net for an earth dam with 30m water depth consists of 25 potential drops and 5 flow channels. If the discharge per meter length of dam is 0.00018m^3/sec, then what is the coefficient of permeability of dam material?	6 Marks	L2	CO2	PO1 PO2 PO8
	b)	A soil deposit has three layers having same thickness each but the permeability of the layers is in the ratio of 1:2:4 from top to bottom. What is the ratio of average permeability in the horizontal direction to that in the vertical direction?	6 Marks	L3	CO2	PO1 PO2

UNIT-III

5.	a)	A vertical concentrated force of 40 kN is acting at a point on the ground surface. Determine the vertical stress intensities due to this load at a depth of 2.5m below GL on the line of action of load and at a depth of 1.5m below GL and a radial distance of 3m.	6 Marks	L2	CO3	PO1 PO2 PO4
	b)	A rectangular footing with dimensions of 2mx3m has to carry a uniformly distributed load of 100 kN/m^2. Plot the distribution of vertical stress intensity due to this load on a horizontal plane at a depth of 2m below the base of the footing by 2:1 dispersion	6 Marks	L2	CO3	PO1 PO2 PO4

(OR)

6.	a)	What is Newmark's Chart? How is it helpful in computing the vertical stress at any depth due to a loaded area?	6 Marks	L1	CO3	PO1
	b)	Determine the vertical stress intensity at a point 3m below the ground level and 2.5m away from the line of action of a vertical point load of 150 kN acting on the ground surface by Boussinesq's method.	6 Marks	L4	CO3	PO1 PO2

UNIT-IV

7.	a)	A 10m thick sand layer is underlain by an 8m thick clay layer. The groundwater is found to be at 3m below the surface at the present time. Old well log data shows that the groundwater was as low as 6m below the surface in the past. What is the Over Consolidation Ratio (OCR) at the midpoint of the clay layer? The density of sand is 18 kN/m^3 and the density of clay is 17 kN/m^3.	6 Marks	L3	CO3	PO1 PO2 PO10
	b)	A laboratory compaction test on soil having specific gravity equal to 2.67 gave a maximum dry unit weight of 17.8 kN/m^3 and a water content of 15%. Determine the degree of saturation, air content and percentage air voids at the maximum dry unit weight. What would be theoretical maximum dry unit weight corresponding to zero air voids at the optimum water content?	6 Marks	L4	CO3	PO1 PO2 PO4 PO6

(OR)

8.	a)	There is a bed of compressible clay of 4m thickness with pervious sand on top and impervious rock at the bottom. In a consolidation test in the laboratory on an undisturbed specimen of clay from this deposit, 90% settlement was reached in 4 hours. The specimen was 20mm thick. Estimate the time in years for the building founded over this deposit to reach 90% of its final settlement.	6 Marks	L4	CO3	PO1 PO2 PO5 PO6
	b)	The maximum dry density of a sample by light compaction test is 1.80 g/cc at an optimum water content of 14.5 %. Find the air voids and the degree of saturation. G=2.67.	6 Marks	L2	CO3	PO1 PO2

UNIT-V

9.	a)	In a triaxial shear test conducted on a soil sample having a cohesion of 12 kN/m^2 and angle of shearing resistance of 36°, the cell pressure was 200 kN/m^2. Determine the value of the deviator stress at failure	6 Marks	L3	CO4	PO1 PO2
	b)	Two drained triaxial tests are performed on the material. In the first test the all-round pressure is 200 kN/m^2 and failure occurs at an added axial stress of 600 kN/m^2. In the second test all-round pressure is 350 kN/m^2 and failure occurs at an added axial stress of 1050 kN/m^2. What values of **c'** and **ø'** correspond to these results?	6 Marks	L3	CO4	PO1 PO2 PO4

(OR)

10.	a)	Differentiate the Consolidated Drained and Consolidated Undrained Triaxial test, with respect to field conditions.	6 Marks	L1	CO4	PO1 PO2
	b)	Calculate the potential shear strength on a horizontal plane at a depth of 3m below the surface in a formation of cohesionless soil when the water table is at a depth of 3.5m. The degree of saturation may be taken as 0.5 on the average. Void ratio = 0.50; grain specific gravity = 2.70; angle of internal friction = 30°. What will be the modified value of shear strength if the water table reaches the ground surface?	6 Marks	L4	CO4	PO1 PO2 PO4 PO5

CODE No.: 19BT40105 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

STRUCTURAL ANALYSIS

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Determine the ratio of deflections Y1:Y2 of a simply supported beam carrying a concentrated load W at mid-span deflects by 'Y1' under the load. If the same beam carries the load W such that it is distributed uniformly over entire length and undergoes a deflection Y2 at the mid span.	4 Marks	L3	CO1	PO1 PO2 PO4 PO5 PO10
	b)	A Cantilever beam of 3m span is 150mm wide and 250mm deep. It carries an UDL of 20 kN/m over its whole span and 25 kN at the free end. Calculate the maximum slope and deflection. Take $E = 2 \times 10^5$ N/mm^2. Use Moment-area method.	8 Marks	L4	CO1	PO1 PO2 PO4 PO5 PO10

(OR)

2.	a)	Determine the mid span deflection of simply supported beam with concentrated load 'W' at mid span by Double Integration method.	4 Marks	L3	CO1	PO1 PO2 PO4 PO5 PO10
	b)	A beam of uniform section 10m long is simply supported at its ends. It carries Point loads of 100 kN and 60 kN at a distance of 2m and 5m respectively from the left end. Calculate: i) The deflection under each load. ii) The maximum deflection. Using Macaulay's method. $E = 200 \times 10^6$ N/m^2 and $I = 118 \times 10^{-4}$ m^4	8 Marks	L4	CO1	PO1 PO2 PO4 PO5 PO10

UNIT-II

3.	a)	Using strain energy method, determine the deflection of the free end of a cantilever of length 'L' subjected to an UDL.	4 Marks	L4	CO2	PO1 PO2 PO4 PO5 PO10
	b)	Find the horizontal deflection at joint C of the pin-jointed frame as shown in Fig. 1. AE is constant for all members.	8 Marks	L4	CO2	PO1 PO2 PO4 PO5 PO10

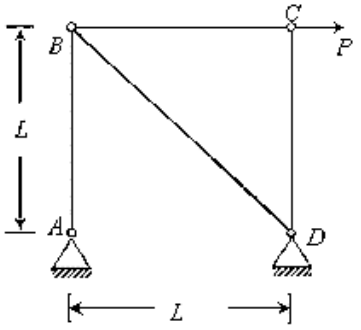


Fig. 1

(OR)

4.	Draw shear force and bending moment diagrams for the fixed beam shown in Fig. 2. Take w = 20 kN/m and L = 10 m.	12 Marks	L4	CO2	PO1 PO2 PO4 PO5 PO10

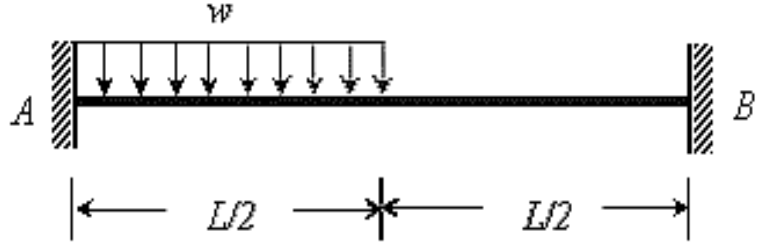


Fig. 2

UNIT-III

5.	Analyze the continuous beam as shown in the Fig. 3 by three moment equation theorem. E is constant. Draw the BMD.	12 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO10

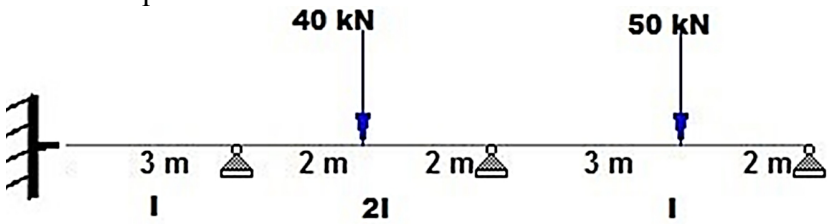


Fig. 3

(OR)

6.	Analyze the continuous beam shown in Fig. 4 by slope deflection method and draw the bending moment diagram.	12 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO10

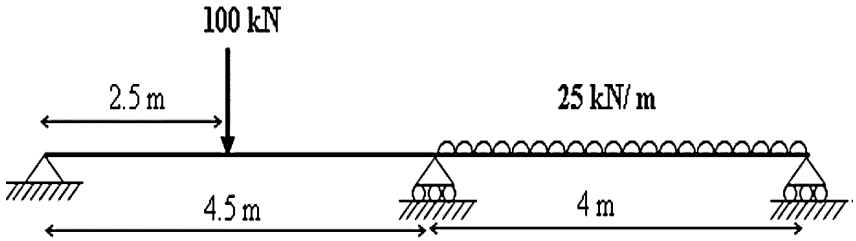


Fig. 4

UNIT-IV

7.	Analyze the continuous beam as shown in Fig. 5 by moment distribution method. Draw the bending moment diagram.	12 Marks	L4	CO4	PO1 PO2 PO4 PO5 PO10

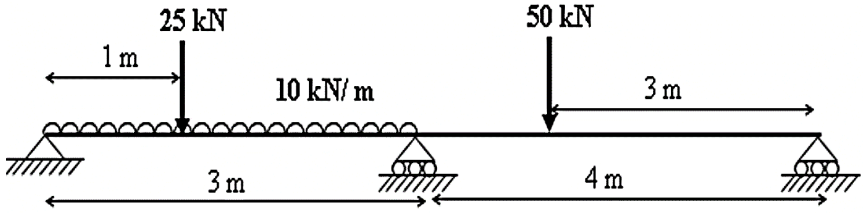


Fig. 5

(OR)

8.	Analyse the continuous beam shown in Fig. 6 by Kani's method. Draw BMD.	12 Marks	L4	CO4	PO1 PO2 PO4 PO5 PO10

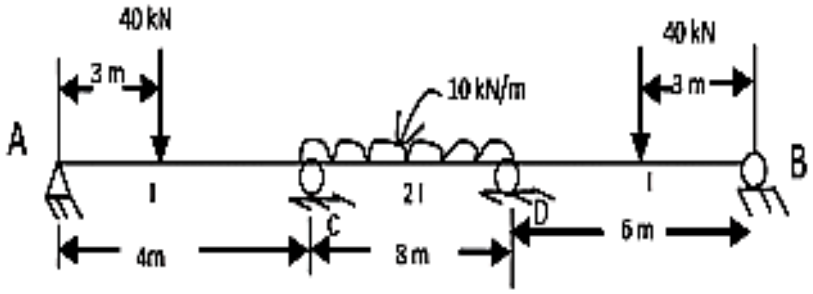


Fig. 6

UNIT-V

9.		A system of four loads 80kN, 160kN, 160kN and 120kN crosses a simply supported beam of span 25m with the 120kN load leading. The loads are equally spaced at 1m. Determine the values of the maximum bending moment and shear force at a section 10m from left support and absolute maximum shear force and bending moment in the beam uniform ILD. Use Influence Lines method.	12 Marks	L4	CO5	PO1 PO2 PO4 PO5 PO10

(OR)

10.	a)	Determine the shape factor for the T-section shown in Fig. 7.	4 Marks	L4	CO5	PO1 PO2

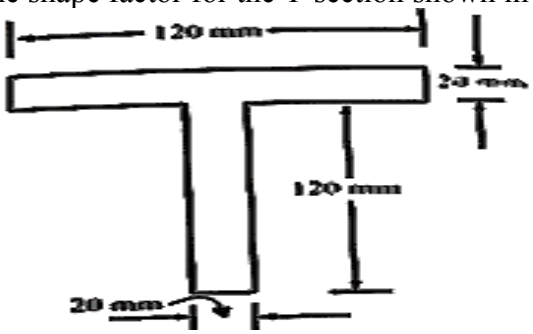


Fig. 7

	b)	Calculate the plastic moment capacity required for the continuous beam with working loads shown in Fig. 8.	8 Marks	L4	CO5	PO1 PO2 PO4 PO5 PO6 PO10

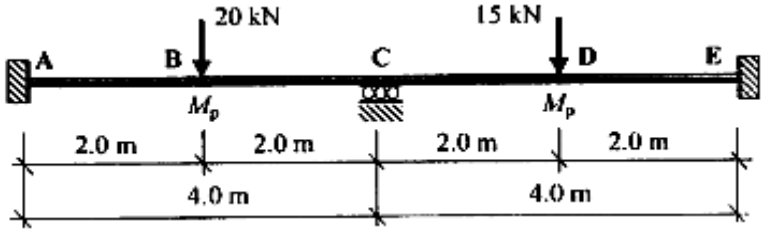


Fig. 8

❀ ❀ ❀

CODE No.: 19BT40106 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

DISASTER MITIGATION AND MANAGEMENT

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Write an account on the impact of disasters on life and environment.	6 Marks	L2	CO1	PO1 PO2 PO6 PO7
	b)	Explain how the public awareness is helpful in risk reduction.	6 Marks	L2	CO1	PO1 PO2 PO7
		(OR)				
2.	a)	Explain about Hazard Assessment.	6 Marks	L2	CO1	PO1 PO2 PO6 PO7
	b)	Explain about basic principles and elements of disaster mitigation.	6 Marks	L2	CO1	PO1 PO2 PO7

UNIT-II

3.	a)	Give adverse effects of tsunami. Also discuss the tsunami mitigation measures.	6 Marks	L2	CO2	PO1 PO2 PO4
	b)	Distinguish between active control and passive control systems. Draw the block diagram of both the systems.	6 Marks	L4	CO2	PO1 PO2 PO5 PO10
		(OR)				
4.	a)	Discuss the consequences of natural disasters in Urban areas in view of earth quakes.	6 Marks	L2	CO2	PO1 PO2
	b)	Consider a worst affected Earthquake hazard and what was government role in its remedial measures?	6 Marks	L5	CO2	PO1 PO2 PO3 PO6

UNIT-III

5.	a)	Explain the necessary steps to be taken to avoid dangerous epidemics after a flood disaster.	6 Marks	L4	CO3	PO1 PO2 PO4 PO6
	b)	Write a short note on the drought control measures adopted across the globe.	6 Marks	L2	CO3	PO1 PO2 PO4 PO7

(OR)

6.	a)	Discuss the consequences of natural disasters in Urban areas in view of i) cyclones ii) floods.	6 Marks	L2	CO3	PO1 PO2 PO7
	b)	Explain the disaster flood with the help of a case study.	6 Marks	L4	CO3	PO1 PO2 PO4

UNIT-IV

7.	a)	Explain briefly different causes for landslides.	6 Marks	L4	CO4	PO1 PO2
	b)	Discuss the types of landslides.	6 Marks	L2	CO4	PO1 PO2
		(OR)				
8.	a)	Discuss the consequences of the natural disaster landslide.	6 Marks	L2	CO4	PO1
	b)	Discuss the various methods of preventing landslides.	6 Marks	L4	CO4	PO1 PO2 PO4

UNIT-V

9.	a)	Explain cost-benefit analysis with respect to various disaster management programs.	6 Marks	L4	CO5	PO1 PO2 PO11
	b)	Discuss about a few emerging trends in disaster management.	6 Marks	L2	CO5	PO1 PO2 PO5 PO12
		(OR)				
10.	a)	Discuss the role of knowledge based expert system in disaster Management.	6 Marks	L3	CO5	PO1 PO2 PO10 PO11
	b)	Discuss the various functions of disaster mitigation organization.	6 Marks	L4	CO5	PO1 PO2 PO5 PO11

CODE No.: 19BT40107 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

SUSTAINABLE ENGINEERING

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	What are the essential components of sustainability?	6 Marks	L1	CO1	PO1 PO2
	b)	Illustrate the three-pillar model of sustainability.	6 Marks	L3	CO1	PO4 PO6
		(OR)				
2.	a)	Explain in detail about Multilateral environmental agreements.	6 Marks	L1	CO1	PO1 PO4
	b)	Explain in detail about Montreal and Kyoto protocols.	6 Marks	L1	CO1	PO1 PO6
		UNIT-II				
3.	a)	Give the list of important activities that can reduce carbon footprint.	6 Marks	L3	CO2	PO5 PO6
	b)	What is environmental management system and list out the functions of EMS?	6 Marks	L2	CO2	PO1 PO7
		(OR)				
4.	a)	How does economic input output-life cycle analysis help to achieve sustainability? Explain.	6 Marks	L1	CO2	PO1 PO2
	b)	What are the steps involved in the environmental health risk assessment? Describe.	6 Marks	L4	CO2	PO6 PO7
		UNIT-III				
5.	a)	Compare and contrast conventional and nonconventional energy with reference to sustainability.	6 Marks	L3	CO3	PO1
	b)	Categorize the various energy sources in the increasing order of their carbon footprint.	6 Marks	L4	CO3	PO1
		(OR)				
6.	a)	Compare the feasibility of different sources of renewable energy with current scenario.	6 Marks	L5	CO3	PO1
	b)	Is there a best energy source that will have the minimum environmental impact? Justify your answer.	6 Marks	L6	CO3	PO1
		UNIT-IV				
7.	a)	Enumerate the basic features of a sustainable habitat.	6 Marks	L5	CO4	PO1
	b)	How to develop sustainable urbanization?	6 Marks	L4	CO4	PO1
		(OR)				
8.	a)	With a suitable industrial example, explain what you understood on industrial symbiosis.	6 Marks	L3	CO4	PO1
	b)	How did industrialization change the way of human life in context to a developing country like India?	6 Marks	L4	CO4	PO1

UNIT-V

9.	a)	What are the prospects of using Biofuel as a renewable energy source?	6 Marks	L5	CO5	PO1
	b)	Explain the concept of smart city with an example.	6 Marks	L4	CO5	PO1 PO2 PO4 PO6
		(OR)				
10.	a)	Give any three examples of air pollutants and their effect on human health and explain control techniques.	6 Marks	L5	CO5	PO2 PO4 PO5
	b)	What are the main causes of urbanization? Discuss.	6 Marks	L3	CO5	PO5 PO6 PO8

CODE No.: 19BT40201 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

DIGITAL ELECTRONICS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Determine the minimum sum of products and minimum product of sums for **f = b'c'd'+bcd+acd'+ab'bc'd**.	6 Marks	L3	CO1	PO2
	b)	Simplify the following function using K-map **F(A,B,C,D)=∑(0,1,2,3,4,6,9,10)+d(7,11,12,13,15)**	6 Marks	L3	CO1	PO5
		(OR)				
2.	a)	Simplify the expression $BD+BCD^1+A^1B^1C^1D^1$ and implement them with two level NAND gate circuit.	6 Marks	L3	CO1	PO5
	b)	Explain the properties of EX-OR and EX-NOR gates.	6 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Design half subtractor and Realize full subtractor using half subtractors.	6 Marks	L1	CO2	PO1
	b)	Implement the following logic function using 8 x 1 and 4 x 1 multiplexer **f(A,B,C,D)=∑m(1,3,4,6,7,9,10,11,14).**	6 Marks	L2	CO2	PO5
		(OR)				
4.	a)	Draw and explain the block diagram of a 4-bit binary adder/subtractor circuit.	6 Marks	L2	CO2	PO5
	b)	Construct 5 to 32 decoder using one 2 to 4 and four 3 to 8 decoders.	6 Marks	L2	CO2	PO4
		UNIT-III				
5.	a)	Explain the operation of Master Slave JK flip-flop with suitable diagrams.	8 Marks	L1	CO3	PO1
	b)	Design 4-bit twisted ring counter. Also draw its state diagram and sequence table.	4 Marks	L3	CO3	PO3
		(OR)				
6.	a)	Design a synchronous sequential counter using JK flip-flop and avoid lock out condition, for **4→6→7→3→1→4**…	6 Marks	L3	CO3	PO3
	b)	Design Mod-9 counter using D flip-flop	6 Marks	L2	CO3	PO5
		UNIT-IV				
7.	a)	Distinguish between Moore and Mealy model with necessary block diagram.	4 Marks	L1	CO4	PO1
	b)	Realize a logic function using **F (A,B,C)= Σ_m(2,4,5,6)** using Hazard Free logic gate network.	8 Marks	L2	CO4	CO4
		(OR)				

8.	a)	Minimize the sequential machine represented in the state table shown below using merger table.	8 Marks	L2	CO4	PO5

Table

Present State	Next State , Z	
	X=0	X=1
A	B,1	H,1
B	F,1	D,1
C	D,0	E,1
D	C,0	E,1
E	D,1	C,1
F	C,1	C,1
G	C,1	D,1
H	C,0	A,1

	b)	Explain finite state machines.	4 Marks	L1	CO4	PO1

UNIT-V

9.	a)	What are programmable logic devices? Explain them in brief.	6 Marks	L1	CO5	PO1
	b)	Draw the logic diagram for implementation of 16 x 8 ROM and explain its architecture.	6 Marks	L2	CO5	PO1

(OR)

10.	a)	Design using PAL the following Boolean functions. W(A,B,C,D)=(2,12,13) X(A,B,C,D)=(7,8,9,10,11,12,13,14,15) Y(A,B,C,D)=(0,2,3,4,5,6,7,8,10,11,15)	6 Marks	L2	CO5	PO1
	b)	Briefly explain the binary multiplication and division algorithm.	6 Marks	L2	CO5	PO1

CODE No.: 19BT40202 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

ELECTRICAL MACHINES-II

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Describe the construction of a 3-phase cage-type induction motor with neat sketches.	6 Marks	L1	CO1	PO1
	b)	A 3-phase, 50Hz, 4 pole slip ring induction motor gives a reading of 120V across slip rings on open circuit, when at rest and supplied with normal supply voltage. The rotor impedance per phase is 0.3 + j1.5Ω. Find the rotor current and torque when machine is running at 5 % slip.	6 Marks	L3	CO1	PO4
		(OR)				
2.	a)	Explain Torque-Slip characteristics of Induction motor.	8 Marks	L1	CO1	PO1
	b)	If an 8-pole induction motor running from a supply of 50HZ has an **emf** in the rotor of frequency 1.5HZ, compute the slip and speed of the motor.	4 Marks	L2	CO1	PO5

UNIT-II

3.	a)	Explain, why the speed of 3-phase induction motor cannot be equal to synchronous speed.	4 Marks	L1	CO1	PO1
	b)	A 3-phase, 4-pole, 50Hz, induction motor has a star connected wound rotor. The rotor **emf** is 50V between the slip rings at standstill. The rotor resistance and standstill reactance are 0.4Ω and 2.0Ω respectively. Calculate: i) Rotor current per phase at starting when slip rings are short circuited. ii) Rotor current per phase at starting if 50Ω per phase resistance is connected between slip rings. iii) Rotor **emf** when the motor us running at full load at 1440 r.p.m. iv) Rotor current at full load and Rotor power factor at full load	8 Marks	L3	CO1	PO4
		(OR)				
4.	a)	Explain the principle of induction generator operation	6 Marks	L1	CO1	PO1
	b)	Discuss in detail about Crawling and Cogging.	6 Marks	L2	CO1	PO7

UNIT-III

5.	a)	Why is a rotating field system used in preference to a stationary field?	6 Marks	L2	CO2	PO1
	b)	A star connected 3-phase 4-pole 50Hz alternator has a single layer winding in 24 stator slots. There are 50 turns in each coil and the flux per pole is 0.05 Wb. Find the open circuit voltage.	6 Marks	L3	CO2	PO4
		(OR)				

6.	a)	Explain the principle of operation of a synchronous generator.	6 Marks	L1	CO2	PO1
	b)	A 220V, 50Hz, 6-pole star-connected alternator with ohmic resistance of 0.06Ω per phase are the following data for open circuit and full load ZPF characteristics:	6 Marks	L3	CO2	PO4

Field Current(A)	0.2	0.4	0.6	0.8	1.00	1.2	1.4	1.8	2.2	2.6	3.0	3.4
Open circuit Voltage (Volts)	29.0	58.0	87.0	116	146	172	194	232	261.5	284	300	310
ZPF voltage (Volts)	-	-	-	-	-	0	29	88	140	177	208	230

Find the percentage voltage regulation at full load current of 40Amps at power factor of 0.8 lagging.

UNIT-IV

7.	a)	Derive an expression for synchronizing torque when a 3-phase alternator is connected to infinite bus-bar.	6 Marks	L2	CO3	PO1
	b)	Two alternators A and B operate in parallel and supply a load of 10MW at 0.8pf lagging.				
		i) By adjusting steam supply of A, its power output is adjusted to 6,000KW and by changing its excitation, its P.F is adjusted to 0.92 lag. Find the Power Factor of alternator B.	6 Marks	L3	CO3	PO7
		ii) If steam supply of both machines is left unchanged, but excitation of B is reduced so that it's P.F becomes 0.92 lead. Find new P.F of A.				
		(OR)				
8.	a)	Discuss and state the conditions necessary for paralleling alternators.	6 Marks	L2	CO3	PO7
	b)	What are the various methods of synchronizing alternators?	6 Marks	L1	CO3	PO1

UNIT-V

9.	a)	Derive the expression for the maximum torque developed per phase of a synchronous motor.	6 Marks	L2	CO4	PO1
	b)	A 75KW, 400V, 4-pole, 3-phase, 50Hz, star connected synchronous motor has a resistance and synchronous reactance of 0.04Ω and 0.4Ω respectively. Compute for full load 0.8pf lead the open circuit **emf** per phase and gross mechanical power developed. Assume an efficiency of 92.5%.	6 Marks	L3	CO4	PO7
		(OR)				
10.	a)	What is hunting and discuss briefly various causes for hunting.	6 Marks	L2	CO4	PO7
	b)	Discuss in detail about Synchronous condenser.	6 Marks	L2	CO4	PO5

CODE No.: 19BT40203 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

ELECTRICAL MEASUREMENTS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	List and describe the different static characteristics of measuring instruments.	6 Marks	L1	CO1	PO1
	b)	Explain the importance of damping mechanism in an instrument and how are they classified.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Explain the construction details of attraction type moving iron instrument. Derive the Torque equation for moving iron instrument, and show that the scale is non-uniform.	6 Marks	L5	CO1	PO3
	b)	The Ayrton universal shunt has a total resistance of 6000 Ω and galvanometer has a resistance of 2000 Ω. Determine the multiplying power of shunt for 1000 Ω, 2000 Ω and 3000 Ω tapping.	6 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Explain with a neat circuit of single phase Dynamometer type Wattmeter and derive the equation for deflection torque.	6 Marks	L2	CO2	PO1
	b)	Draw the possible methods of connections of the pressure coil of a wattmeter and compare the errors.	6 Marks	L2	CO2	PO4
		(OR)				
4.	a)	A 230V, 50Hz single phase energy meter has a constant of 200 revolutions per kWh. While supplying a non-inductive load of 4.4A at normal voltage, the meter takes 3 minutes for 10 revolutions. Calculate the percentage error of the instrument.	6 Marks	L3	CO2	PO2
	b)	Draw the connection diagram of a 3-phase energy meter and explain its working. How do you correct it, if it is found to be moving fast and justify your answer?	6 Marks	L4	CO2	PO6

UNIT-III

5.	a)	A current transformer with turn's ratio 1:201 is rated as 1000/5A, 25VA. The core loss and magnetizing components of primary are 3A and 7A under rated conditions. Find the ratio and phase angle errors for full burden at 0.88 p.f leading.	6 Marks	L3	CO3	PO2
	b)	Illustrate the ratio and phase angle errors in potential transformer and explain how to overcome.	6 Marks	L4	CO3	PO1
		(OR)				
6.	a)	Draw the circuit diagram of Crompton's potentiometer and explain its working. Describe the steps used when measuring an unknown resistance.	6 Marks	L1	CO3	PO5
	b)	A Potentiometer consisting of a resistance dial having 15 steps of 10Ω each and a series connected slide wire of 10 Ω which is divided into 100 divisions. If the working current of the potentiometer is 15mA and each division of the slide wire can read accurately up to 1/5 of its span. Calculate the resolution of the potentiometer in volts.	6 Marks	L3	CO3	PO2

UNIT-IV

7.	a)	Explain kelvin's double bridge for measurement of low resistance with neat circuit diagram and list out the assumptions made.	6 Marks	L2	CO4	PO3
	b)	The four arms of a Wheatstone bridge are as follows AB=5Ω; BC=500Ω; CD=1000Ω; DA=100Ω. The galvanometer has a resistance of 100 Ω, a sensitivity of 5mm/μA and it is connected across AC. A source of 5V DC is connected across BD. Calculate the current through the galvanometer and its deflection, if the resistance of arm DA is changed from 100Ω to 102Ω.	6 Marks	L3	CO4	PO4
		(OR)				
8.	a)	Show how the Wien's bridge can be used for the measurement of frequency in audio range. Derive the equation for frequency **f**.	6 Marks	L2	CO4	PO1
	b)	The four arms of an A.C. bridge network are as follows: Arm AB: an unknown capacitance; Arm BC: a standard capacitor C3 of 1000pF; Arm CD: a non-inductive resistor R4 of 100 Ω in parallel with a capacitor C4 of 0.01μF; Arm DA: a non – inductive resistor R2 of 1000 Ω. The A.C. supply is connected across terminals B, D and the supply frequency is 50Hz. If the bridge is balanced with the above values, determine the components of the unknown impedance, while deriving the balanced conditions.	6 Marks	L3	CO4	PO4

UNIT-V

9.	a)	Explain how frequency can be measured using Lissajous patterns in CRO and give any two examples.	6 Marks	L2	CO5	PO5
	b)	Explain in detail about the following characteristics of Digital meters: i) Resolution ii) Sensitivity iii) Accuracy, and compare with respect to analog meters.	6 Marks	L1	CO5	PO1
		(OR)				
10.	a)	List the different types of DVM. Explain working principle of ramp type Digital Voltmeter with diagram.	6 Marks	L2	CO5	PO1
	b)	Describe the working of Digital frequency meter with a neat diagram.	6 Marks	L2	CO5	PO1

❀ ❀ ❀

CODE No.: 19BT40204 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

TRANSMISSION AND DISTRIBUTION

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What is method of images? Derive an expression for the capacitance per unit length of a 3-phase transposed line. What is the effect of earth on the capacitance of the line?	6 Marks	L2	CO1	PO1
	b)	A 3-phase, 50Hz, 66kV overhead transmission line has its conductors arranged at the corners of an equilateral triangle of 3m sides and the diameter of each conductor is 1.5cm. Determine the capacitance per phase, if the length of line is 100 km, and also calculate the charging current.	6 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Derive the expression for capacitance of single core cable with conductor diameter d and inner sheath diameter D.	6 Marks	L2	CO1	PO1
	b)	An 11kV, 50Hz, single phase cable 2.5km long, has a diameter of 20mm and internal sheath radius of 15mm. If the dielectric has a relative permittivity of 2.4, determine i) capacitance ii) charging current iii) total charging kVAR.	6 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Explain the equivalent Π method of solution for the performance of medium transmission lines. Draw a phasor diagram with the receiving end voltage as reference. Comment how this analysis help full in real time power systems.	6 Marks	L4	CO2	PO4
	b)	An overhead 3-phase transmission line delivers 5000 kW at 22kV at 0.8 p.f lagging, the resistance and reactance of each conductor is 4Ω and 6Ω respectively. Determine i) sending end voltage, ii) percentage regulation, iii) Transmission efficiency.	6 Marks	L3	CO2	PO2
		(OR)				
4.	a)	Derive the expressions for reflected voltage and current waves, when the transmission line is terminated by the capacitive load.	6 Marks	L2	CO2	PO1
	b)	A cable with surge impedance of 100Ω is terminated in two parallel connected open wires having surge impedances of 600Ω, and 1000Ω respectively. If a steep fronted voltage wave of 2 kV travels along the cable, find the voltage and current in the cable and the open-wire lines immediately after the travelling wave has reached the transition point. Assume voltage wave to be infinite length.	6 Marks	L5	CO2	PO3

UNIT-III

5.	a)	Derive the expressions for sag and tension when the supports are at unequal heights. Comment how it is useful in power system.	6 Marks	L2	CO3	PO1
	b)	A transmission line has a span of 150m between level supports. The line conductor has a cross-sectional area of 1.25cm^2 and it weighs 120kg per 100m. If the breaking stress of copper conductor is 4220 kg per cm^2. Calculate the maximum sag for a safety factor of 4. Assume maximum wind pressure of 90 kg per m^2.	6 Marks	L3	CO3	PO7

(OR)

6.	a)	Define string efficiency. Why is it necessary to have high string efficiency? How can it be achieved?	6 Marks	L4	CO3	PO4
	b)	The three bus-bar conductors in an outdoor sub-station are supplied by units of post insulators. Each unit consists of a stack of 3-pin insulators fixed one on the top of the other. The voltage across the lowest insulator is 8·45 kV and that across the next is 7·25 kV. Find the bus-bar voltage of the station.	6 Marks	L3	CO3	PO3

UNIT-IV

7.	a)	Explain the different types of loads and it's characteristics with realistic examples.	6 Marks	L1	CO4	PO1
	b)	A two conductor main AB, 500m in length is fed from both ends at 250 volts. Loads of 50A, 60A, 40A and 30A are tapped at distance of 100m, 250m, 350m and 400m from end A respectively. If the X-section of conductor be 1cm^2 and specific resistance of the material of the conductor is 1·7μΩcm, determine the minimum consumer voltage.	6 Marks	L3	CO4	PO2

(OR)

8.	a)	Discuss for solving AC distribution problems when power factors referred to receiving end voltage.	6 Marks	L2	CO4	PO3
	b)	A single phase distributor AB has a total impedance of (0·1 + j 0·2)Ω. At the far end B, a current of 80A at 0·8 p.f. lagging and at mid-point C a current of 100A at 0·6 p.f. lagging are tapped. If the voltage of the far end is maintained at 200V, determine: i) Supply end voltage V_A ; ii) Phase angle between V_A and V_B .The load power factors are with respect to the voltage at the far end.	6 Marks	L3	CO4	PO2

UNIT-V

9.	a)	Explain the various factors to be considered to decide the ideal location of substation.	6 Marks	L1	CO5	PO1
	b)	Show that if the voltage drops are limited, six feeders can carry only 1.25 times as much load as the four feeders.	6 Marks	L3	CO5	PO2

(OR)

10.	a)	Explain different bus bar arrangements with a neat sketch.	6 Marks	L1	CO5	PO1
	b)	Discuss in detail the present design practice of secondary distribution system.	6 Marks	L6	CO5	PO3

❀ ❀ ❀

CODE No.: 19BT40301 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

DYNAMICS OF MACHINERY

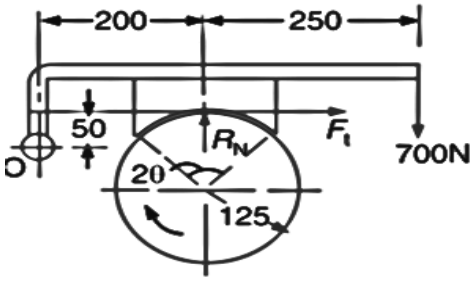
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		A centrifugal clutch is to transmit 15 kW at 900 r.p.m. The shoes are four in number. The speed at which the engagement begins is 3/4th of the running speed. The inside radius of the pulley rim is 150mm and the centre of gravity of the shoe lies at 120mm from the centre of the spider. The shoes are lined with Ferrodo for which the coefficient of friction may be taken as 0.25. Determine: i) Mass of the shoes, and ii) Size of the shoes, if angle subtended by the shoes at the centre of the spider is 60^{o} and the pressure exerted on the shoes is 0.1 N/mm^2.	12 Marks	L5	CO1	PO2 PO3 PO4
		(OR)				
2.	a)	Define brake and classify them according to the means used for transforming the energy and according to the direction of acting force.	4 Marks	L1	CO1	PO1
	b)	A single block brake is shown in figure below. The diameter of the drum is 250mm and the angle of contact is 90°. If the operating force of 700N is applied at the end of a lever and the coefficient of friction between the drum and the lining is 0.35, determine the torque that may be transmitted by the block brake.	8 Marks	L5	CO1	PO2 PO3 PO4



All dimensions in mm.

UNIT-II

3.	a)	Define processional Angular Motion and Gyroscopic couple.	4 Marks	L1	CO2	PO1
	b)	Explain the effect of Gyroscopic Couple on a Naval Ship when ship steers towards left/right and rotor rotates in counter clockwise /clockwise direction and direction of viewing is from rear end or stern.	8 Marks	L4	CO2	PO2 PO3 PO4
		(OR)				
4.	a)	Differentiate coefficient of fluctuation of speed and coefficient fluctuation of energy. Explain why fluctuations of speed and energy occurs in a engine.	4 Marks	L2	CO3	PO1
	b)	A punching press is driven by a constant torque electric motor. The press is provided with a flywheel that rotates at maximum speed of 225 r.p.m. The radius of gyration of the flywheel is 0.5m. The press punches 720 holes per hour; each punching operation takes 2 second and requires 15 kN-m of energy. Find the power of the motor and the minimum mass of the flywheel if speed of the same is not to fall below 200 r. p. m.	8 Marks	L5	CO3	PO2 PO3 PO4

UNIT-III

5.	a)	Explain the need of Governors and classify them.	4 Marks	L1	CO4	PO1
	b)	In an Engine Governor of the Porter type, the upper and lower arms are 200mm and 250mm respectively and pivoted on the axis of rotation. The mass of the central load is 15 kg, the mass of each ball is 2 kg and friction of the sleeve together with the resistance of the operating gear is equal to a load of 25N at the sleeve. If the limiting inclinations of the upper arms to the vertical are 30° and 40°, find, taking friction into account, range of speed of the governor.	8 Marks	L5	CO4	PO2 PO3 PO4

(OR)

6.		Define and explain the terms: i) Sensitiveness of a Governor. ii) Stability of a Governor. iii) Isochronous of a Governor. iv) Hunting.	12 Marks	L2	CO4	PO1 PO2

UNIT-IV

7.		A shaft carries four masses in parallel planes A, B, C and D in this order along its length. The masses at B and C are 18 kg and 12.5 kg respectively, and each has an eccentricity of 60 mm. The masses at A and D have an eccentricity of 80 mm. The angle between the masses at B and C is 100° and that between the masses at B and A is 190°, both being measured in the same direction. The axial distance between the planes A and B is 100 mm and that between B and C is 200 mm. If the shaft is in complete dynamic balance, determine : i) the magnitude of the masses at A and D ; ii) the distance between planes A and D ; and iii) the angular position of the mass at D.	12 Marks	L5	CO5	PO2 PO3 PO4

(OR)

8.		Obtain expressions for primary and secondary unbalanced forces in V- engines and explain how to balance them in detail.	12 Marks	L4	CO5	PO2

UNIT-V

9.	a)	Define Longitudinal, Transverse and Torsinal vibrations.	3 Marks	L1	CO6	PO1
	b)	A shaft 1.5 m long supported in flexible bearings at the ends carries two wheels each of 50 kg mass. One wheel is situated at the centre of the shaft and the other at a distance of 375 mm from the centre towards left. The shaft is hollow of external diameter 75 mm and internal diameter 40 mm. The density of the shaft material is 7700 kg/m^3 and its modulus of elasticity is 200 GN/m^2. Find the lowest whirling speed of the shaft, taking into account the mass of the shaft.	9 Marks	L5	CO6	PO2 PO3 PO4

(OR)

10.		The mass of an electric motor is 120 kg and it runs at 1500 r.p.m. The armature mass is 35 kg and its C.G. lies 0.5 mm from the axis of rotation. The motor is mounted on five springs of negligible damping so that the force transmitted is one-eleventh of the impressed force. Assume that the mass of the motor is equally distributed among the five springs. Determine : i) Stiffness of each spring. ii) Dynamic force transmitted to the base at the operating speed. iii) Natural frequency of the system.	12 Marks	L5	CO6	PO2 PO3 PO4

❀ ❀ ❀

CODE No.: 19BT40302 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

ENGINEERING METROLOGY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Determine limit dimensions for a clearance fit between mating parts of diameter 40mm, providing a minimum clearance of 0.10mm with a tolerance on the hole equal to 0.025mm and on shaft 0.05mm using both systems.	6 Marks	L3	CO1	PO1
	b)	Explain the significance of the following terms with suitable examples: Accuracy, precision, calibration, interchange ability and selective assembly.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Explain the different types of fits used in engineering practice with neat sketches.	6 Marks	L2	CO1	PO2
	b)	Describe different types of errors in measurement and their causes.	6 Marks	L4	CO1	PO2

UNIT-II

3.	a)	Explain the working principle advantages, disadvantages of optical comparators.	6 Marks	L2	CO2	PO1
	b)	Explain the principle of working of a sine bar for angular measurement with the help of a diagram. List the advantages and limitations of sine bar.	6 Marks	L2	CO2	PO2
		(OR)				
4.	a)	Explain the construction and working of Sigma mechanical comparator with a neat sketch.	6 Marks	L3	CO2	PO1
	b)	State and explain the Taylor's principle of gauge design with neat sketch of Plug gauge and Snap gauges.	6 Marks	L2	CO2	PO1

UNIT-III

5.	a)	Explicate the uses of interferometer in measuring flatness of surfaces.	6 Marks	L2	CO3	PO3
	b)	Explain the principle and construction of an auto collimator with the help of a neat sketch.	6 Marks	L3	CO3	PO1
		(OR)				
6.	a)	State and explain the methods of measuring primary texture of a surface.	6 Marks	L2	CO3	PO2
	b)	Define flatness. Give examples of instruments used for measurement of flatness.	6 Marks	L2	CO3	PO1

UNIT-IV

7.	a)	With the help of neat sketch, explain Three-wire method for measuring of effective diameter.	6 Marks	L2	CO4	PO1
	b)	Describe the procedure of measurement of tooth thickness using constant chord method with neat sketch.	6 Marks	L3	CO4	PO2
		(OR)				

8.	a)	Explain any two methods of measuring Gear Pitch.	6 Marks	L2	CO4	PO5
	b)	Describe with a neat sketch the measurement of pitch of internal and external screw threads using a pitch measuring machine.	6 Marks	L3	CO4	PO1

UNIT-V

9.	a)	Explain the construction and working of optical pyrometer.	6 Marks	L2	CO5	PO1
	b)	Write a brief note on Gauge factor with respect to stain gauges.	6 Marks	L3	CO5	PO2

(OR)

10.	a)	Write a note on: i) Thermocouple material. ii) Advantages and disadvantages of Thermocouples.	6 Marks	L2	CO5	PO1
	b)	Explain the working principle of an electrical resistance thermometer.	6 Marks	L2	CO5	PO1

CODE No.: 19BT40303 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

FLUID MECHANICS AND HYDRAULIC MACHINERY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Define Surface tension. Prove that the relationship between surface tension and pressure inside a droplet of liquid in excess of outside pressure is given by $p = 4\sigma / d$.	6 Marks	L2	CO1	PO1 PO2
	b)	Determine the intensity of shear of an oil having viscosity = 1 poise. The oil is used for lubricating the clearance between a shaft of diameter 10cm and its journal bearing. The clearance is 1.5mm and the shaft rotates at 150 r.p.m.	6 Marks	L3	CO1	PO1 PO2 PO3
		(OR)				
2.	a)	What are the gage pressure and absolute pressure at a point 3m below the free surface of a liquid having a density of 1.53×10^3 kg/m^3, if the atmospheric pressure is equivalent to 750mm of mercury? The specific gravity of mercury is 13.6 and density of water = 1000 kg/m^3.	6 Marks	L3	CO1	PO1 PO2 PO3
	b)	What do you mean by single column manometers? How are they used for the measurement of pressure?	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Explain the importance of the following: i) Stream lines . ii) Streak lines. iii) Path lines.	6 Marks	L2	CO2	PO1
	b)	A 30cm diameter pipe, conveying water, branches into two pipes of diameters 20cm and 15cm respectively. If the average velocity in the 30cm diameter pipe is 2.5 m/s, find the discharge in this pipe. Also determine the velocity in 15cm pipe, if the average velocity in 20cm pipe is 2 m/s.	6 Marks	L3	CO2	PO1 PO2 PO3
		(OR)				
4.	a)	Name the different forces present in a fluid flow. For the Euler's equation of motion, which forces are considered and also derive the equation.	6 Marks	L2	CO2	PO1 PO2
	b)	A horizontal venturimeter with inlet and throat diameters 30cm and 15cm respectively is used to measure the flow of water. The reading of the differential manometer connected to the inlet and the throat is 20cm of mercury. Determine the rate of flow. Take $C_d = 0.98$.	6 Marks	L3	CO2	PO1 PO2 PO3
		UNIT-III				
5.	a)	Define the displacement thickness of a boundary layer and derive an expression for it.	6 Marks	L2	CO3	PO1 PO2
	b)	What do you mean by boundary layer separation? List the methods of preventing this separation.	6 Marks	L2	CO3	PO1
		(OR)				

6.	a)	Find head lost due to friction in a pipe of diameter 300mm and length 50m, through which water is flowing at a velocity of 3 m/s using: i) Darcy formula. ii) Chezy's formula, where C = 60.	6 Marks	L3	CO3	PO1 PO2 PO3
	b)	Define and explain the terms: i) Hydraulic gradient line. ii) Total energy line.	6 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	Obtain an expression for the force exerted by a jet of water on a moving vertical plate in the direction of the jet.	6 Marks	L2	CO4	PO1 PO2
	b)	Water is flowing through a pipe at the end of which a nozzle is fitted. The diameter of the nozzle is 100mm and the head of water at the center nozzle is 100m. Find the force exerted by the jet of water on a fixed vertical plate. The coefficient of velocity is given as 0.95.	6 Marks	L3	CO4	PO1 PO2 PO3
		(OR)				
8.		Obtain an expression for the work done per second by water on the runner of a Pelton wheel. Hence derive an expression for maximum efficiency of the Pelton wheel giving the relationship between the jet speed and bucket speed.	12 Marks	L3	CO4	PO1 PO2 PO3
		UNIT-V				
9.	a)	Obtain an expression for the work done by impeller of a centrifugal pump on water per second per unit weight of water.	6 Marks	L2	CO5	PO1
	b)	Find the number of pumps required to take water from a deep well under a total head of 89m. All the pumps are identical and are running at 800 rpm. The specific speed of each pump is given as 25 while the rated capacity of each pump is 0.16 m^3/s.	6 Marks	L3	CO5	PO1 PO2 PO3
		(OR)				
10.	a)	Obtain expressions for discharge and work done to drive a double acting reciprocating pump.	6 Marks	L2	CO5	PO1
	b)	A single acting reciprocating pump running at 30 r.p.m delivers 0.012 m^3/s of water. The diameter of the piston is 25cm and the stroke length is 50cm. Determine: i) theoretical discharge. ii) coefficient of discharge. iii) slip and % of slip.	6 Marks	L3	CO5	PO1 PO2 PO3

CODE No.: 19BT40304 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

METAL CUTTING AND MACHINE TOOLS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the purpose and basic elements of machining.	6 Marks	L2	CO1	PO1
	b)	Draw the neat sketch of single point cutting tool and show the different parts and angles on it.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Describe the conversion of tool angles using graphical method.	6 Marks	L2	CO1	PO1
	b)	Explain the concept of rake and clearance angles with neat sketch.	6 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Explain briefly about ductile and brittle materials.	6 Marks	L2	CO2	PO1 PO7
	b)	What are the different types of chip breakers and explain it?	6 Marks	L2	CO2	PO1 PO7
		(OR)				
4.		Derive the expression for the various cutting forces using Merchant's circle diagram.	12 Marks	L3	CO2	PO1 PO2 PO3 PO7

UNIT-III

5.	a)	What is the principle of operation and specifications of lathe?	6 Marks	L2	CO3	PO1 PO2 PO3
	b)	Write different operations performed on lathe machine.	6 Marks	L1	CO3	PO1 PO2
		(OR)				
6.		Write the classification of Automatic lathes with neat sketch.	12 Marks	L1	CO3	PO1 PO2 PO7

UNIT-IV

7.	a)	List the specifications and different operations in slotting machine.	6 Marks	L1	CO4	PO1 PO2 PO3 PO7
	b)	Write the principle of operation of planning machine.	6 Marks	L1	CO4	PO1 PO2
		(OR)				
8.		Explain the differences between drilling and boring machines.	12 Marks	L2	CO4	PO1 PO7

UNIT-V

9.	a)	Write the comparison of grinding, lapping and honing.	6 Marks	L1	CO5	PO1 PO2 PO7
	b)	Discuss on the specification and selection of grinding wheel.	6 Marks	L2	CO5	PO1 PO2 PO3
		(OR)				
10.		Write differences between horizontal and vertical milling machines with neat sketch.	12 Marks	L2	CO6	PO1 PO7

CODE No.: 19BT40305 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

THERMAL ENGINEERING-I

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Give the differences between four stroke and two stroke engines.	6 Marks	L2	CO1	PO1
	b)	Draw and explain VTD for four stroke petrol engine and PTD for two stroke Diesel engines.	6 Marks	L2	CO1	PO1 PO2
		(OR)				
2.	a)	Briefly explain the stages of combustion in S.I Engine and explain the various factors that Influence the flame speed.	6 Marks	L2	CO1	PO1 PO2
	b)	Explain the phenomenon of knock in C.I Engines and compare it with S.I Engine knock.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Define Brake power, indicated power, Friction power, Mean effective pressure and Specific fuel consumption.	6 Marks	L2	CO1	PO1
	b)	The following data and results refer to a test on a single-cylinder, two stroke cycle engines. Indicated mean effective pressure = 50 KPa, Cylinder diameter = 21 cm, Piston Stroke = 28 cm, Engine speed = 360 r.p.m, Brake Torque = 628 Nm, Fuel Consumption = 8.16 Kg/h, Calorific value of fuel = 42700 kJ/kg. calculate: i) Mechanical Efficiency. ii) The indicated thermal efficiency. iii) Brake thermal efficiency. iv) Brake specific fuel consumption.	6 Marks	L3	CO1	PO1 PO2 PO3
		(OR)				
4.	a)	List out the methods of obtaining Friction Power and explain any one of them in detail.	4 Marks	L3	CO1	PO1 PO2 PO3
	b)	A single cylinder, four stroke diesel engine works on the following data. Cylinder bore = 15cm, Stroke = 25cm, Speed = 250 r.p.m, Area of Indicator diagram = 6cm², Length of the indicator diagram = 9cm, Spring Constant = 7.5 bar/cm, Brake Specific Fuel Consumption = 0.24 kg/KWh, C.V of fuel = 42000 kJ/kg, Diameter of brake wheel = 70cm, Rope diameter = 3.5cm, Brake load = 40 Kg. Calculate: i) Brake power. ii) Indicated mean. iii) Effective pressure. iv) Mechanical efficiency. v) Indicated thermal efficiency	8 Marks	L2	CO1	PO1

UNIT-III

5.	a)	What are the different methods used to improve efficiency of a gas turbine plant? Explain any one method with a neat sketch.	6 Marks	L3	CO2	PO1 PO2 PO3
	b)	In a gas turbine power plant, operating on Joule cycle, air is compressed from 1 bar and 15^0C through a pressure ratio of 6. It is then heated to 727^0C in the combustion chamber and expanded back to a pressure of 1 bar. Calculate the net work done, cycle efficiency and work ratio. Assume isentropic efficiencies of turbine and compressor are 90 and 85% respectively.	6 Marks	L3	CO2	PO1 PO2 PO3
		(OR)				
6.	a)	Explain the working of Ram jet engine with a neat sketch. Define following terms as applied to jet propulsion specific thrust, specific impulse, thrust power and propulsive power.	6 Marks	L4	CO2	PO1
	b)	Explain briefly with a sketch the working principle of a rocket.	6 Marks	L2	CO2	PO1

UNIT-IV

7.	a)	Explain the effects of clearance volume in reciprocating air compressor and derive an expression for volumetric efficiency in terms of clearance ratio and pressure ratio.	6 Marks	L3	CO3	PO1 PO2
	b)	2 kg/s of air enter the L.P cylinder of a two stage, reciprocating air compressor. The overall pressure ratio is 9. The air at inlet to compressor is at 100 kPa and 35^0C. The index of compression in each cylinder is 1.3. Find the Inter Cooler pressure for perfect inter cooling. Also find the minimum power required for compression and percentage saving over single stage compression.	6 Marks	L3	CO3	PO1 PO2 PO3
		(OR)				
8.	a)	Explain the working principle of roots blower with a neat sketch.	6 Marks	L3	CO3	PO1
	b)	Describe the principle of operation, construction and working of centrifugal compressor.	6 Marks	L2	CO3	PO1

UNIT-V

9.	a)	Draw the schematic for an ideal Rankine cycle. Draw p-v, T-s and h-s diagrams for this cycle.	6 Marks	L3	CO4	PO1 PO2 PO3
	b)	Steam at 20 bar, 360^0C is expanded in a turbine to 0.08 bar. It then enters a condenser where it is condensed to saturated liquid water. The feed pump supplies saturated water back to the boiler. Calculate the network per kg of steam and cycle efficiency for ideal Rankine cycle.	6 Marks	L2	CO4	PO1
		(OR)				
10.	a)	What are methods which can lead to increase in thermal efficiency of Rankine cycle?	6 Marks	L4	CO4	PO1 PO2
	b)	The steam is the working fluid in an ideal Rankine cycle with superheat and reheat. The steam enters the first stage turbine at 8 MPa, 480^0C and expands to 0.7 MPa. It is then reheated to 440^0C before entering the second stage turbine. Where it expands to the condenser pressure of 0.008 MPa. The net output of the cycle is 100 MW. Determine: i) thermal efficiency of the cycle. ii) mass flow rate of steam in kg/h.	6 Marks	L3	CO4	PO1 PO2 PO3

CODE No.: 19BT40307 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

MANAGEMENT SCIENCE

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	Give details about functions of management with a suitable example.	12 Marks	L2	CO1	PO1
	(OR)				
2.	Write short notes on conceptual, technical skills of a manager and role of a manager.	12 Marks	L2	CO1	PO1 PO2

UNIT-II

3.	Give an illustrative explanation of different training and development methods adopted in Human Resource Management.	12 Marks	L2	CO2	PO1 PO2
	(OR)				
4.	Compare and contrast between job analysis and job evaluation.	12 Marks	L2	CO2	PO1 PO2

UNIT-III

5.	Facilities location and layout explain with neat diagrams.	12 Marks	L2	CO3	PO1
	(OR)				
6.	Balance the line for the following:	12 Marks	L2	CO3	PO1 PO2

Task	Operation Time (in Mins)	Predecessors	Task	Operation Time (in Mins)	Predecessors
1	5	Nil	5	9	4
2	5.2	1	6	4	3
3	7.5	2	7	9	Nil
4	6.5	2	8	9	5, 6, 7

The Line operates for 8 hours per days and an output of 200 units per day is desired. Draw the Precedence diagram and calculate:

i) No. of late jobs
ii) Cycle Time
iii) Theoretical Number of Work Stations required
iv) Balance Efficiency

UNIT-IV

7.	Elucidate in detail, the concept, evolution and scope of marketing strategy formulation and different components of a marketing plan.	12 Marks	L2	CO4	PO1 PO2
	(OR)				
8.	Explain channels of marketing with the help of marketing communication.	12 Marks	L2	CO4	PO1 PO2

UNIT-V

9. Draw the network for the activities whose three time estimates are given in the table. From the three time estimates obtain the expected times of all the activities and find criticalpath, project duration, slack for all events, probability of completing the projectin 20 days. — 12 Marks — L4 — CO5 — PO1 PO2 PO3 PO4 PO11

Activity	Optimistic time (days)	Most likely time (days)	Pessimistic time (days)
1 – 2	1	2	3
1 – 3	5	6	7
1 – 4	3	5	7
2 – 5	5	7	9
3 – 5	2	4	6
5 – 6	4	5	6
4 – 7	4	6	8
6 – 7	2	3	4

(OR)

10. A company is designing a new product for welding 2 different alloys. The company has limited time and resources to complete the project. — 12 Marks — L4 — CO5 — PO1 PO2 P03 PO4 PO11

Activity	Immediate predecessor	Time (days)		Cost (Rs)	
		Normal	Crash	Normal	Crash
A	-	4	3	400	125
B	A	5	4	800	200
C	A	4	2	520	150
D	B	3	2	600	225
E	C	3	2	255	100
F	B,E	4	2	600	175

i) Draw the project network.
ii) Find the critical path.
iii) Find the project completion time and the corresponding cost.
iv) What is the total cost, if the project deadline is 13 days?
v) Assume the project deadline to be 10 days. The company has to bear Rs.170 for each day of delay. Find the optimal number of days to crash the project.

CODE No.: 19BT40401 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

ANALOG COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Define standard form of Amplitude Modulation (AM) and explain the time and frequency domain expression of AM wave.	6 Marks	L2	CO1	PO2
	b)	The output power of an AM Transmitter is 1KW when sinusoidal signal modulated to depth of 100%. Calculate the power in each side band when the modulation depth is reduced to 50%.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Discuss about frequency domain description of VSB modulation with neat diagram.	6 Marks	L2	CO1	PO1
	b)	Explain coherent detection of SSB waves with the help of block diagram.	6 Marks	L3	CO1	PO2
		UNIT-II				
3.	a)	An FM radio link has a frequency deviation of 40KHz, the modulating signal frequency is 4 KHz. Calculate bandwidth needed for the link. What will be the bandwidth, if the frequency deviation is reduced to 20 KHz.	6 Marks	L1	CO1	PO2
	b)	Explain the FM demodulation using first order PLL.	6 Marks	L2	CO1	PO4
		(OR)				
4.	a)	Show that frequency modulation can be derived using phase modulation.	6 Marks	L4	CO1	PO2
	b)	Explain how zero crossing detector can be used as an FM demodulator.	6 Marks	L2	CO1	PO4
		UNIT-III				
5.	a)	Discuss in detail about threshold effect in FM system.	6 Marks	L4	CO2	PO2
	b)	An FM receiver receives an FM Signal $v(t) = 10 \cos (2\pi 10^8 t+6) \sin (2\pi 10^6 t)$. Calculate Figure of Merit of this receiver.	6 Marks	L4	CO2	PO2
		(OR)				
6.	a)	Derive the expression for signal to noise ratio at the output of envelope detector of a normal AM System.	6 Marks	L4	CO2	PO2
	b)	A message signal band limited to 10 KHz is transmitted through channel after modulation, power loss in the channel is 40dB and double sided noise power spectral density is given by 10^{-10} Watt/Hz. Find the transmitted power required to get output SNR of 50dB. If modulation schemes used is i) AM with μ=1; ii) FM with β=4.	6 Marks	L1	CO2	PO1
		UNIT-IV				
7.	a)	Draw the block diagram of low level and high level AM transmitter and explain its working.	6 Marks	L1	CO3	PO1
	b)	Draw the block diagram of super heterodyne receiver and explain the function of each block.	6 Marks	L1	CO3	PO3
		(OR)				

8.	a)	Explain about simple AGC and delayed AGC.	6 Marks	L4	CO3	PO2
	b)	A super heterodyne receiver the intermediate frequency is 15MHz and the local oscillator frequency is 3.5GHz. If the frequency of the received signal is greater than the local oscillator frequency, then what is image frequency?	6 Marks	L1	CO3	PO1

UNIT-V

9.	a)	Explain the Time division multiplexing.	6 Marks	L1	CO4	PO1
	b)	Explain the PWM modulation and its generation with neat sketches.	6 Marks	L3	CO4	PO2

(OR)

10.	a)	Explain the generation and demodulation of PPM with the help of block diagram.	6 Marks	L1	CO4	PO1
	b)	Compare the PAM, PWM and PPM.	6 Marks	L2	CO4	PO1

CODE No.: 19BT40402 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

ELECTRONIC CIRCUIT ANALYSIS AND DESIGN

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

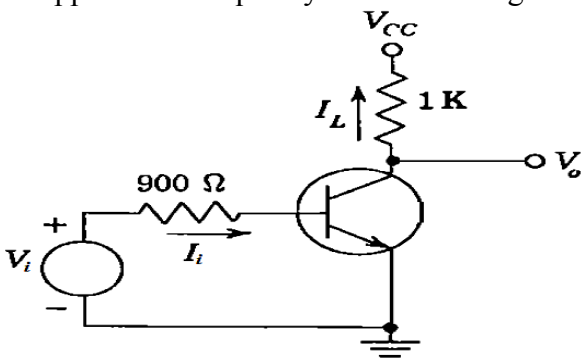
Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Derive an expression for lower cut-off frequency of the BJT amplifier due to the effect of input coupling capacitor.	6 Marks	L4	CO1	PO1
	b)	"To achieve larger input impedances and current amplification factor Darlington pair is used". Discuss on the above statement by giving suitable expressions with your analytical skills on multistage amplifiers.	6 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Develop an expression for voltage gain, input and output impedances of common source MOSFET amplifier.	6 Marks	L4	CO1	PO3
	b)	Describe the small signal model of MOSFET at low-frequency.	6 Marks	L2	CO1	PO1

UNIT-II

3.	a)	The hybrid-π parameters of the transistor used in the circuit shown are given at room temperature: $\mathbf{g_m}$ = 50mA/V, $\mathbf{r_{bb'}}$ = 100Ω, $r_{b'e}$ = 1KΩ, $\mathbf{r_{b'c}}$ = 4MΩ , $\mathbf{r_{ce}}$= 80KΩ, C_c = 3pF , C_e = 100pF. Using Miller's theorem and approximate analysis, compute the upper 3-dB frequency of the current gain $A_I = I_L/I_i$. 	6 Marks	L3	CO2	PO2
	b)	Derive the expression for voltage gain of an emitter follower circuit at high frequencies.	6 Marks	L4	CO2	PO2
		(OR)				
4.	a)	Derive the expression for Hybrid-π conductance of common emitter transistor.	6 Marks	L4	CO2	PO2
	b)	Derive the expression for CE Short Circuit Current Gain A_i as a function of frequency. Draw the frequency Response Curve.	6 Marks	L4	CO2	PO2

UNIT-III

5.	a)	Elucidate the concept of negative feedback with neat block diagram and give the outlines of each block.	6 Marks	L2	CO3	PO1
	b)	The open loop gain of an amplifier is A = 5 x 10^4. If the open loop gain decreases by 10%, the closed loop gain must not be change by more than 0.1%. Determine the required value of the feedback transfer function (β) and the closed loop gain (A_f).	6 Marks	L3	CO3	PO2

(OR)

6.	a)	Derive the expressions for input and output impedance of current-series feedback amplifier.	6 Marks	L4	CO3	PO2
	b)	A voltage-series feedback amplifier employs a basic amplifier with input and output resistances each of 2kΩ and gain A = 1000 V/V. The feedback factor β = 0.1 V/V. Find the gain A_f, the input resistance R_{if}, and the output resistance R_{of} of the closed loop amplifier.	6 Marks	L3	CO3	PO2

UNIT-IV

7.	a)	Derive the expression for frequency of oscillation of Wien bridge oscillator using BJT.	6 Marks	L3	CO3	PO2
	b)	Derive the expression for frequency of oscillations of Hartley oscillator.	6 Marks	L3	CO3	PO2

(OR)

8.	a)	State and explain Barkhausen criterion to be satisfied to get the sustained oscillations.	6 Marks	L2	CO3	PO1
	b)	Derive the expression for frequency of oscillations and gain condition for RC phase shift oscillator using BJT.	6 Marks	L4	CO3	PO2

UNIT-V

9.	a)	A power transistor operating in class A transformer coupled amplifier is to deliver a maximum of 5W to a 4Ω load (i.e. R_L = 4Ω). The quiescent point is adjusted for symmetrical clipping, and the collector supply voltage is V_{CC} = 20V. Assume ideal characteristics with V_{min} = 0. Determine: i) Transformer turns ratio. ii) Peak collector current. iii) Quiescent operating point. iv) Collector-circuit efficiency.	6 Marks	L3	CO4	PO2
	b)	Explain the origin of crossover distortion. Describe the method to minimize this distortion.	6 Marks	L2	CO4	PO1

(OR)

10.	a)	Derive an expression for bandwidth of a single stage tuned amplifier.	6 Marks	L3	CO4	PO2
	b)	Write short notes on: i) Class S Power amplifier. ii) Heat sinks.	6 Marks	L1	CO4	PO1

CODE No.: 19BT40403 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

LINEAR AND DIGITAL IC APPLICATIONS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Illustrate the operation of instrumentation amplifier with neat sketches.	6 Marks	L2	CO1	PO1
	b)	List out and explain the applications of PLL.	6 Marks	L1	CO1	PO2
		(OR)				
2.	a)	Draw the functional block diagram of timer in Astable mode and derive expression for free running frequency.	6 Marks	L2	CO1	PO2
	b)	List out and explain the applications of monostable multivibrator.	6 Marks	L1	CO1	PO2
		UNIT-II				
3.	a)	Explain the operation of R-2R DAC.	6 Marks	L2	CO2	PO3
	b)	Explain about second order HPF with neat sketches and derive the expression for F_L.	6 Marks	L2	CO2	PO3
		(OR)				
4.	a)	Explain the operation of Dual Slope ADC.	6 Marks	L2	CO2	PO3
	b)	Design a second order LPF with a cutoff frequency of 10KHz.	6 Marks	L4	CO2	PO3
		UNIT-III				
5.	a)	Write the basics in HDL programming using structural and data flow modeling.	6 Marks	L2	CO3	PO5
	b)	Write a process based HDL program for the prime-number detector of 4-bit input and explain the flow using logic circuit.	6 Marks	L3	CO3	PO5
		(OR)				
6.	a)	Explain about dataflow design elements of VHDL.	6 Marks	L2	CO3	PO5
	b)	Write a VHDL code for basic gates in dataflow model.	6 Marks	L3	CO3	PO5
		UNIT-IV				
7.	a)	Write a VHDL program for 4x1 Multiplexer and 1x4 Demultiplexer.	6 Marks	L3	CO4	PO5
	b)	Explain about parity generator and checker.	6 Marks	L2	CO4	PO5
		(OR)				
8.	a)	Write a HDL code for Barrel Shifter using 74x151 multiplexer.	6 Marks	L3	CO4	PO5
	b)	Write a HDL code 74x181 Arithmetic and Logic Unit.	6 Marks	L3	CO4	PO5
		UNIT-V				
9.	a)	Explain how a JK- flip-flop can be constructed using a T- flip-flop.	6 Marks	L2	CO5	PO1
	b)	Write a HDL code for JK flip-flop.	6 Marks	L3	CO5	PO5
		(OR)				
10.	a)	Draw the circuit of MOD 8 Down ripple counter with D-flip-flops and explain its operation.	6 Marks	L2	CO5	PO1
	b)	Write a HDL code for 74x194 universal shift register.	6 Marks	L3	CO5	PO5

❀ ❀ ❀

CODE No.: 19BT40404 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

PROBABILITY AND STOCHASTIC PROCESSES

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	A pack contains 4 white and 2 green pencils, another contains 3 white and 5 green pencils. If one pencil is drawn from each pack, find the probability that: i) Both are white. ii) One is white, and another is green	6 Marks	L2	CO1	PO4
	b)	Explain about joint and conditional probability.	6 Marks	L1	CO1	PO2
		(OR)				
2.	a)	An urn contains 10 white and 3 black balls while another urn contains 3 white and 5 black balls. Two are drawn from the first urn and put into the second urn and then a ball is drawn from latter. What is the probability that it is a white ball?	6 Marks	L2	CO1	PO4
	b)	State and prove the Baye's theorem.	6 Marks	L1	CO1	PO2

UNIT-II

3.	a)	Let X be a Continuous random variable with density function $f(x) = (x/9)+ K \quad 0 \le x \le 6$ $= 0 \quad$ otherwise Find the value of K and also find $P\{2 \le X \le 5\}$.	6 Marks	L3	CO2	PO4
	b)	Let X and Y be the random variables defined as $X=\cos\theta$ and $Y=\sin\theta$, where θ is a uniform random variable over $(0, 2\pi)$ i) Are X and Y Uncorrelated? ii) Are X and Y Independent?	6 Marks	L2	CO2	PO4
		(OR)				
4.	a)	Prove that $P(x_1 < X \le x_2) = F_x(x_2) - F_x(x_1)$.	6 Marks	L2	CO2	PO1
	b)	If X is a normal variate with mean 30 and standard deviation 5. Estimate the probabilities when. i) $26 \le X \le 40$. ii) $X \ge 45$.	6 Marks	L2	CO2	PO2

UNIT-III

5.	a)	Explain the Gaussian Random Variable and Exponential Random variable with corresponding neat sketches.	6 Marks	L1	CO2	PO2
	b)	The ranks of 16 students in Mathematics and Statistics are as follows. (1,1) (2,10) (3,3) (4,4) (5,5) (6,7) (7,2) (8,6) (9,8) (10,11) (11,15) (12,9) (13,14) (14,12) (15,16) (16,13). Calculate the rank correlation coefficient for proficiencies of this group in Mathematics and Statistics.	6 Marks	L3	CO2	PO2
		(OR)				
6.	a)	If the joint PDF of two dimensional random variable (x, y) is given by: $F_{XY}(X,Y) = 2; \quad$ for $0 < x < 1, \quad 0 < y < x$ $= 0; \quad$ otherwise Find the marginal density function of X and Y.	6 Marks	L2	CO2	PO4

	b)	Discuss the properties of conditional distribution function.	6 Marks	L3	CO2	PO2

UNIT-IV

7.	a)	Find the cross-correlation function corresponding to the cross power spectrum $S_{XY}(\omega)= 6/[(9+ \omega^2)(3+j\ \omega)]^2$.	6 Marks	L3	CO3	PO4
	b)	Write short notes on cross power density spectrum.	6 Marks	L3	CO3	PO2
		(OR)				
8.	a)	A random process has the power density spectrum $S_{YY}(\omega)= 6\ \omega^2/[1+ \omega^4]$. Find the average power in the process.	6 Marks	L3	CO3	PO4
	b)	Find the auto correlation function of the random process whose psd is $16/[\ \omega^2+4]$.	6 Marks	L3	CO3	PO4

UNIT-V

9.	a)	An amplifier has a bandwidth of 500KHz, and an input resistance of 150. When a 0.5×10^{-6}v input signal level is applied to the amplifier input under matched condition, the output SNR=0dB. Determine the noise figure of the amplifier.	6 Marks	L2	CO4	PO4
	b)	Discuss the following external noises with examples. i) Atmospheric noise. ii) Extra-terrestrial noise. iii) Manmade noise.	6 Marks	L1	CO4	PO2
		(OR)				
10.	a)	An antenna having a noise temperature of 40K is connected to an amplifier having a gain of 250dB and an equivalent noise bandwidth of 3.5MHz. The equivalent noise temperature of the amplifier is 270K. Find the available noise power.	6 Marks	L2	CO4	PO4
	b)	Write a short note on Linear Transformations of Gaussian Random Variables.	6 Marks	L1	CO4	PO2

CODE No.: 19BT40441 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

ANALOG ELECTRONICS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Draw the circuit diagram of two stage R-C coupled transistor amplifier and explain the working of it.	6 Marks	L2	CO1	PO1
	b)	Explain different types of distortions in amplifiers.	6 Marks	L1	CO1	PO2
		(OR)				
2.	a)	Explain how the frequency response will get affected by R-C coupling in multistage amplifier.	6 Marks	L3	CO1	PO2
	b)	Explain how the bootstrapping method will increase the input impedance of Darlington amplifier.	6 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	Show that in voltage series and in voltage shunt feedback amplifiers the gain will be reduced by a factor of $(1+\beta A)$.	6 Marks	L2	CO2	PO2
	b)	Calculate the gain, input and output impedances of a voltage-series feedback amplifier having A= -300, R_i= 1.5kΩ, R_o= 50 kΩ and β= -1/15.	6 Marks	L3	CO2	PO5
		(OR)				
4.	a)	What are the advantages and disadvantages of the introduction of negative feedback in amplifiers? Explain.	6 Marks	L2	CO2	PO2
	b)	Show that in a current series feedback amplifier the input and output impedances are increased by a factor of $(1+\beta A)$ with feedback.	6 Marks	L4	CO2	PO3
		UNIT-III				
5.	a)	Explain the principle of operation of Wein bridge oscillator.	6 Marks	L2	CO2	PO2
	b)	Compare RC phase shift oscillator and Wein bridge oscillator.	6 Marks	L4	CO2	PO5
		(OR)				
6.	a)	Draw and explain the operation of colpitt's oscillator	6 Marks	L1	CO2	PO1
	b)	In a transistorized Hartely oscillator the two inductances are 2 mH, and 20 μH while the frequency has to be changed from 950 kHz to 2050 kHz. Calculate the range over which the capacitor is to be varied.	6 Marks	L3	CO2	PO4
		UNIT-IV				
7.	a)	Show that the transformer coupled class A amplifier has maximum efficiency of 50%.	6 Marks	L2	CO3	PO2
	b)	Design a class B power amplifier to deliver 25W to a load resistor R_L = 8Ω, using transformer coupling, V_m=V_{CC} =25V. Assume necessary data.	6 Marks	L3	CO3	PO4
		(OR)				
8.	a)	Explain the principle of operation of class C power amplifier with neat sketches.	6 Marks	L2	CO3	PO2
	b)	Determine the maximum power dissipation allowed for a 100 W silicon transistor (rated at 25°C) for a derating factor of 0.6 W/°C at a case temperature of 150° C.	6 Marks	L4	CO3	PO4

UNIT-V

9.	a)	Describe how 555 Timer IC can be used to generate a square wave.	6 Marks	L2	CO4	PO2
	b)	Design a second order low pass filter with upper frequency cut off of 12 kHz.	6 Marks	L3	CO4	PO3
		(OR)				
10.	a)	Explain the working of 555 Timer IC in monostable multi vibrator mode and give its applications.	6 Marks	L2	CO4	PO1
	b)	Draw the circuit diagram and explain the operation of op-amp based second order low-pass and high-pass filters.	6 Marks	L3	CO4	PO2

CODE No.: 19BT40501 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

COMPUTER NETWORKS

[Computer Science and Engineering, Information Technology]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Describe various types of Networks.	6 Marks	L2	CO1	PO1
	b)	Compare OSI and TCP/IP Reference Models.	6 Marks	L4	CO1	PO2
		(OR)				
2.	a)	Demonstrate wireless LANs in detail.	6 Marks	L3	CO1	PO1
	b)	Explain any two guided transmission media.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Sixteen-bit messages are transmitted using a Hamming code. How many check bits are needed to ensure that the receiver can detect and correct single bit errors? Show the bit pattern transmitted for the message 1101001100110101. Assume that even parity is used in the Hamming code.	6 Marks	L4	CO3	PO2
	b)	Describe Bridges, Routers and Gateways.	6 Marks	L2	CO5	PO1
		(OR)				
4.	a)	Consider the delay of pure ALOHA versus slotted ALOHA at low load. Which one is less? Explain.	6 Marks	L2	CO1	PO1
	b)	Discuss A protocol using selective repeat with figures.	6 Marks	L2	CO3	PO1
		UNIT-III				
5.	a)	Explain Network Layer design issues.	6 Marks	L2	CO3	PO2
	b)	Demonstrate hierarchical routing with figures.	6 Marks	L3	CO2	PO4
		(OR)				
6.	a)	Explain Bellman-Ford routing algorithm with figure and analyze Count-to-Infinity Problem.	6 Marks	L2	CO2	PO2
	b)	Describe congestion prevention policies in detail.	6 Marks	L2	CO5	PO3
		UNIT-IV				
7.	a)	Explain Real-time Transport Control Protocol.	6 Marks	L2	CO3	PO1
	b)	Demonstrate TCP Segment header with figure.	6 Marks	L3	CO3	PO1
		(OR)				
8.	a)	Analyze TCP Congestion control in detail.	6 Marks	L4	CO3	PO3
	b)	Describe UDP Segment header.	6 Marks	L2	CO3	PO1
		UNIT-V				
9.	a)	Can a computer have two DNS names that fall in different top-level domains? If so, give a plausible example. If not, explain why not.	6 Marks	L4	CO4	PO2
	b)	Describe HTTP and FTP.	6 Marks	L2	CO4	PO6
		(OR)				
10.	a)	Analyze Name servers.	6 Marks	L4	CO4	PO2
	b)	Describe various Message Formats.	6 Marks	L2	CO4	PO1

CODE No.: 19BT40502 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

DATABASE MANAGEMENT SYSTEMS

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Define a data model. Describe various data models	6 Marks	L1	CO1	PO1
	b)	Discuss about database languages with suitable example.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Explain the following: i) Entity Type. ii) Relationship Type. iii) Weak-entity set.	6 Marks	L3	CO1	PO1
	b)	Construct ER model for Student database of University with a neat diagram	6 Marks	L3	CO1	PO2
		UNIT-II				
3.	a)	What are the properties of a relation?	4 Marks	L1	CO2	PO1
	b)	Describe different types of constraints used in relational model.	8 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Compare relational algebra and relational calculus.	6 Marks	L2	CO2	PO1
	b)	List and explain about any four operations of relational algebra.	6 Marks	L2	CO2	PO1
		UNIT-III				
5.	a)	Write a structure of SQL and also explain various data types.	6 Marks	L3	CO3	PO2
	b)	Mention and explain about group functions that are used in SQL.	6 Marks	L2	CO2	PO2
		(OR)				
6.	a)	Differentiate procedural and non-procedural languages.	6 Marks	L1	CO3	PO1
	b)	Write a PL/SQL programme to reverse the given number.	6 Marks	L2	CO3	PO4
		UNIT-IV				
7.	a)	Why the Functional Dependencies are needed? Explain its concept.	6 Marks	L1	CO4	PO1
	b)	Describe about different normal forms used to normalize the relations.	6 Marks	L2	CO4	PO2
		(OR)				
8.	a)	Draw and explain Transaction state transition diagram.	6 Marks	L3	CO4	PO2
	b)	What is serializability? Explain its concept,	6 Marks	L1	CO4	PO2
		UNIT-V				
9.	a)	Describe Two-Phase Locking protocol and explain about various types of Two-Phase Locking.	6 Marks	L2	CO5	PO1
	b)	Explain about Multi-version concurrency control mechanism.	6 Marks	L3	CO5	PO2
		(OR)				
10.	a)	State and explain various file organization methods. Give suitable examples to each of them.	6 Marks	L2	CO5	PO1
	b)	Distinguish between extendible and linear hashing.	6 Marks	L1	CO5	PO1

CODE No.: 19BT40503 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

DESIGN AND ANALYSIS OF ALGORTIHMS

[Computer Science and Engineering, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

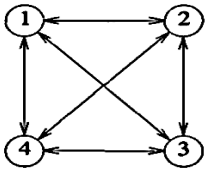
1.	a)	Discuss various types of asymptotic time complexity notations.	6 Marks	L1	CO1	PO1
	b)	Write a recursive function to find the sum of n natural numbers. Show its time complexity using step count method	6 Marks	L3	CO3	PO3
		(OR)				
2.	a)	Solve the following recurrence relation and find its asymptotic bound on T. $T(n) = 2T(n/2) + n$, if $n > 1$ $= 1$ otherwise	6 Marks	L4	CO1	PO2
	b)	Define amortized analysis illustrate aggregate analysis with example.	6 Marks	L3	CO1	PO1

UNIT-II

3.	a)	Consider the set of elements {23, 18, 53, 38, 49, 16, 58, 42}. Sort these elements using merge sort algorithm. Analyze its time complexity and represent in the form of recurrence relation.	6 Marks	L4	CO2	PO2
	b)	Illustrate simpleFind() and collapsingFind() algorithms with suitable examples.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Describe the general method of Divide and Conquer in detail.	6 Marks	L1	CO2	PO1
	b)	Describe Strassen's matrix multiplication algorithm.	6 Marks	L2	CO2	PO1

UNIT-III

5.	a)	Compute the length of optimal tour of traveling sales person for the following digraph with its edge lengths.	6 Marks	L4	CO3	PO3

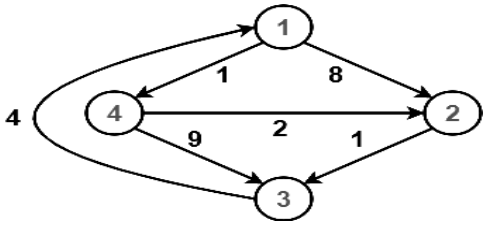


(a)

0	10	15	20
5	0	9	10
6	13	0	12
8	8	9	0

(b)

	b)	Find all pairs shortest paths for the following graph using Floyd-War shall algorithm.	6 Marks	L4	CO3	PO2



(OR)

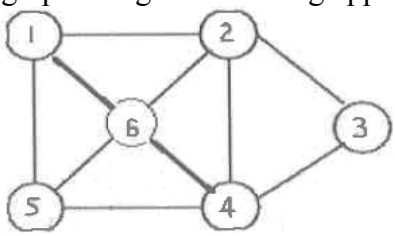
6.	a)	Give the general method of dynamic programming and discuss its applications.	6 Marks	L1	CO2	PO1
	b)	Construct an Optimal Binary Search Tree for (do, if, int, while), p(1:4) =(3,3,1,1) and q(0:4)=(2,3,1,1,1).	6 Marks	L3	CO2	PO2

UNIT-IV

7.	a)	State Huffmann coding. Illustrate it with suitable example.	6 Marks	L3	CO2	PO2
	b)	Compute all possible subsets of w[1:7] = { 15, 7, 20, 5, 18, 10, 12} and m = 35 by applying sum of subsets approach.	6 Marks	L3	CO2	PO2

(OR)

8.	a)	State Job sequencing with deadlines problem. Outline the steps of algorithm to solve it.	6 Marks	L3	CO2	PO2
	b)	What is Hamiltonian Cycle? Draw the portion of state space tree for the following graph using backtracking approach?	6 Marks	L3	CO2	PO2



UNIT-V

9.		Obtain the portion of the State Space tree that will be generated by Least Cost Branch and Bound for the following cost matrix of Travelling sales person instance.	12 Marks	L2	CO3	PO2

∞	7	3	12	8
3	∞	6	14	9
5	8	∞	6	18
9	3	5	∞	11
18	14	9	8	∞

(OR)

10.	a)	Compare and contrast deterministic and non-deterministic algorithms.	6 Marks	L3	CO4	PO2
	b)	State Cook's theorem. Discuss the importance of this theorem.	6 Marks	L2	CO4	PO1

CODE No.: 19BT40504 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

CYBER LAWS AND SECURITY

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	What is E-Governance? Mention the objectives of e-governance.	6 Marks	L1	CO1	PO1
	b)	What are the legal issues of cyberspace?	6 Marks	L1	CO1	PO1
		(OR)				
2.		Define Jurisdiction. List the three pre-requisites of Jurisdiction.	12 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	State the different models of E-Commerce.	6 Marks	L1	CO2	PO2
	b)	What is Indian Contract Act, 1872? How it is different with IT Act, 2000.	6 Marks	L4	CO2	PO1
		(OR)				
4.	a)	Explain B2C E-contracts.	6 Marks	L2	CO2	PO1
	b)	Discuss Online customer protection in India (B2B, B2C).	6 Marks	L2	CO2	PO6
		UNIT-III				
5.		Write a short notes on: i) Cryptography. ii) UNCITRAL.	12 Marks	L2	CO2	PO1
		(OR)				
6.	a)	Briefly explain E-Money and RBI's guidelines on mobile banking and payments	6 Marks	L3	CO2	PO1
	b)	What is the role of certifying authority in PKI, The Indian Information Technology Act and Electronic signatures?	6 Marks	L2	CO2	PO2
		UNIT-IV				
7.	a)	Define intellectual property rights. Explain the objectives and importance of intellectual property law.	6 Marks	L2	CO3	PO1
	b)	Briefly explain the copyright issues on the Internet.	6 Marks	L2	CO3	PO1
		(OR)				
8.	a)	Explain copyright protection for computer software.	6 Marks	L2	CO3	PO6
	b)	Discuss Digital Rights Management.	6 Marks	L2	CO3	PO6
		UNIT-V				
9.	a)	Compare India legislations with USA in Cyber crimes.	6 Marks	L4	CO4	PO8
	b)	What is Cyber Stalking? How this is different with Cyber Terrorism.	6 Marks	L4	CO4	PO8
		(OR)				
10.	a)	What is cyber crime? Explain its categories.	6 Marks	L2	CO4	PO8
	b)	What are the challenges to right of privacy in India?	6 Marks	L2	CO4	PO8

❀ ❀ ❀

CODE No.: 19BT41001 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

INDUSTRIAL INSTRUMENTATION
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Discuss Hot-wire gas bridge type.	4 Marks	L2	CO1	PO1
	b)	Compare Searle's rotating cylinder, Cone and Plate viscometer.	8 Marks	L3	CO1	PO1
		(OR)				
2.	a)	Define Density, Viscosity and Humidity.	6 Marks	L2	CO1	PO1
	b)	Write short notes on Psychrometer and hygrometer.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Explain Force balance and Vibrating Cylinder.	6 Mark	L2	CO2	PO1
	b)	With necessary diagram discuss Low Pressure measurement.	6 Mark	L2	CO2	PO2
		(OR)				
4.	a)	Describe McLeod and Knudsen Gage.	6 Marks	L2	CO2	PO1
	b)	List the advantage and disadvantage of electrical types measurements.	6 Marks	L2	CO2	PO2
		UNIT-III				
5.	a)	Elaborate Float–and– tape and Float–and–shaft method.	7 Marks	L3	CO3	PO1
	b)	Distinguish Inductive and Capacitance type.	5 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Illustrate the working principle of Air-Purge type with necessary diagram.	8 Marks	L3	CO3	PO2
	b)	Deliberate principle of the Bubbler type with advantage and disadvantage.	4 Marks	L1	CO3	PO3
		UNIT-IV				
7.	a)	Explain the Turbo magnetic flow meter with diagram.	7 Mark	L3	CO4	PO1
	b)	Describe with neat sketch Gyroscopic flow mete.	5 Marks	L2	CO4	PO1
		(OR)				
8.	a)	Illustrate the working of Electromagnetic flow meter.	8 Marks	L3	CO4	PO2
	b)	Discuss the advantages and disadvantages of rotameter.	4 Marks	L1	CO4	PO1
		UNIT-V				
9.	a)	Write short notes on Chopper and low drift amplifier.	4 Marks	L1	CO5	PO1
	b)	Describe working principle of charge and electrometer amplifier.	8 Marks	L3	CO5	PO1
		(OR)				
10.	a)	Elaborate Proximity Sensors with block diagram and list the applications.	8 Marks	L3	CO5	PO1
	b)	Design V to I converter with necessary circuit.	4 Marks	L1	CO5	PO1

CODE No.: 19BT41501 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

THEORY OF COMPUTATION
[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Design a DFA for the set of all strings with exactly 3 consecutive zeros. Σ={0,1}.	6 Marks	L4	CO1	PO2
	b)	Design NFA to accept the set of all strings over {a,b} that ends with 'aba' and find its equivalent DFA to accept the same set.	6 Marks	L3	CO1	PO2

(OR)

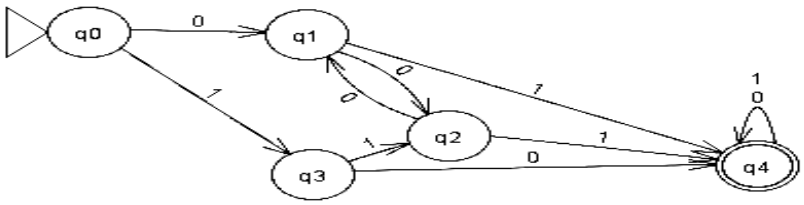
2.	a)	Construct NFA for the following NFA with **ε**-moves, where q_1 is an initial and the final state.	6 Marks	L3	CO1	PO2

	a	b	ε
- *q_1	Φ	Φ	{q_2}
q_2	{q_3}	{q_4}	Φ
q_3	Φ	{q_2}	Φ
q_4	Φ	Φ	{q_1}

	b)	Prove that a language L is accepted by some **ε**–NFA if and only if L is accepted by some DFA.	6 Marks	L4	CO2	PO3

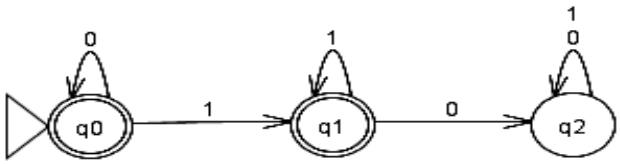
UNIT-II

3.	a)	Write Regular-Expression for the following languages. i) Set of Strings of a's and b's that ends with 'ab' or 'bb' ii) Set of strings of a's and b's that begins with 'ab' and contains the substring 'ba'. iii) For the language over Σ={0,1} where the set of strings in which every 0 is immediately followed by at least two 1's.	6 Marks	L3	CO2	PO1
	b)	Minimize the following DFA.	6 Marks	L4	CO2	PO2



(OR)

4.	a)	Derive Regular-Expression for the following Finite Automaton.	6 Marks	L4	CO2	PO3



	b)	Write Regular-Expression for the following Languages. i) L = {Set of strings of 0's and 1's ends with '01'}. ii) L = {Set of strings of a's and b's begins with 'ab' or 'ba'}.	6 Marks	L3	CO2	PO1

iii) L = {Set of strings 0's and 1's containing substring '000'}.

UNIT-III

5.	a)	Construct Parse tree and also show Left most derivation and Rightmost derivation for the strings 'ababbba' and 'bbbbba' from the following grammar. $S \rightarrow aS/bS/a/b/\epsilon$	6 Marks	L4	CO3	PO3
	b)	Generate a CFG for the language $\mathbf{L=\{o^i1^j0^k/j>i+k\}}$.	6 Marks	L4	CO4	PO3
		(OR)				
6.	a)	Convert the following CFG in Greiback Normal Form (GNF). $S \rightarrow AA/a$ $A \rightarrow SS/b$	6 Marks	L4	CO3	PO5
	b)	Find an equivalent grammar in to CNF for the following CFG. $S \rightarrow ABCD$, $A \rightarrow Aa/b$, $B \rightarrow Bb/b$, $C \rightarrow Cc/c$, $D \rightarrow Dd/d$	6 Marks	L4	CO3	PO5

UNIT-IV

7.	a)	Consider a PDA $\mathbf{M=(\{s,p,q\},\{a, c\},\{a, z_0\}, \delta, s, z_0, p)}$ which accepts language $\mathbf{L=\{a^ncb^n/n >= 1\}}$ by final state, where δ is defined as follows: $\mathbf{\delta (s, a, z_0) = (s, az_0)}$ $\mathbf{\delta (s, a, a) = (s,aa)}$ $\mathbf{\delta (s, c, a) = (q, a)}$ $\mathbf{\delta (q, a, a) = (q, \varepsilon)}$ $\mathbf{\delta (q, \varepsilon, z_0) = (p,z_0)}$ Construct an equivalent PDA M^1 which accepts L in empty stack	6 Marks	L4	CO4	PO3
	b)	Design PDA for language L={w| w contains equal number of a's and b's }.	6 Marks	L4	CO4	PO2
		(OR)				
8.	a)	For the PDA M =($\{q_0,q_1\},\{0,1\},\{0,1,z_0\},\delta,q_0,Z_0,\Phi$) where δ is given by $\delta(q_0,\varepsilon,Z_0)=\{(q_1,\varepsilon)\}$, $\delta(q_0,0,Z_0)=\{(q_0,0Z_0)\}$, $\delta(q_0,0,0)=\{(q_0,00)\}$, $\delta(q_0,1,0)=\{(q_0,10)\}$, $\delta(q_0,1,1)=\{(q_0,11)\}$, $\delta(q_0,0,1)=\{(q_1,\varepsilon)\}$, $\delta(q_1,0,1)=\{(q_1,\varepsilon)\}$, $\delta(q_1,0,0)=\{(q_1,\varepsilon)\}$, $\delta(q_1,\varepsilon,Z_0)=\{(q_1,\varepsilon)\}$ Obtain the CFG generating the language accepted by M. This PDA accepts L={1n0m+n/m, n ≥ 0.	6 Marks	L3	CO3	PO3
	b)	Construct PDA equivalent to the following grammar. S→aAA, A→aS/bS/a.	6 Marks	L4	CO4	PO2

UNIT-V

9.	a)	Define Turing Machine. Explain Modifications of Turing Machine.	6 Marks	L3	CO5	PO3
	b)	Design Turing machine for language L = $\{WW^R \mid W$ is in $(0+1)^*\}$.	6 Marks	L3	CO5	PO3
		(OR)				
10.	a)	Design a TM to perform addition of two unary numbers.	6 Marks	L4	CO5	PO3
	b)	Explain Language acceptability by Turing machine with an example.	6 Marks	L2	CO2	PO1

❀ ❀ ❀

CODE No.: 19BT41501 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

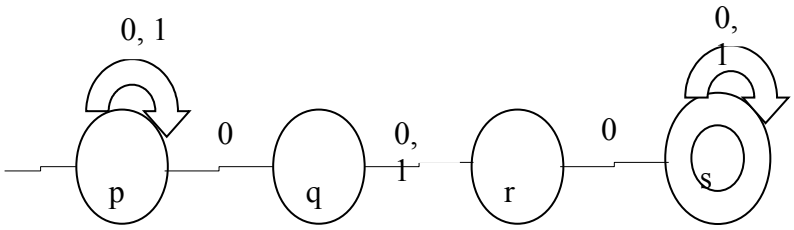
THEORY OF COMPUTATION
[Information Technology]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Design a DFA to accept the language where L = {w / w has both an even number of 0's and even number of 1's}.	6 Marks	L3	CO2	PO2
	b)	Construct DFA for the given following NFA.	6 Marks	L4	CO1	PO2



(OR)

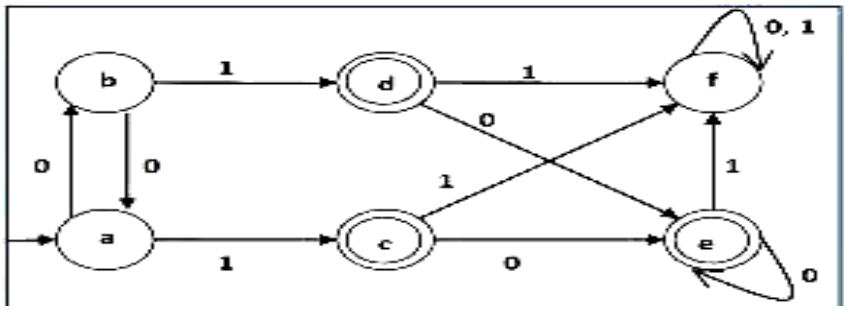
2.	a)	State and prove equivalence of NFA with ε – transitions and NFA.	6 Marks	L4	CO2	PO3
	b)	Compare and contrast Moore machine and Mealy machine.	6 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Discuss in detail the closure properties of regular sets.	6 Marks	L4	CO2	PO2
	b)	Construct a finite automata equivalent to (0+1)*(00+11)(0+1)*.	6 Marks	L2	CO3	PO1

(OR)

4.	a)	Minimize the following automata.	6 Marks	L4	CO2	PO2



	b)	Discuss in detail Applications of regular expressions.	6 Marks	L3	CO2	PO1

UNIT-III

5.		What is an ambiguous grammar? Check the grammar G having productions S → aB / bA, A → a / aS / bAA, B → b / bS / aBB is ambiguous or not?	12 Marks	L4	CO3	PO5

(OR)

6.	a)	Remove the useless symbols of the following CFG having productions. S→aB/ aCD/ aE, B→bC, C→aB/ b, D→aE, E→bCD	6 Marks	L4	CO3	PO3
	b)	Convert the following grammar G having productions E → E + T / T, T → T * F / F, F → (E) / id, into equivalent CNF grammar.	6 Marks	L4	CO3	PO3

UNIT-IV

7.	a)	Design a PDA for the language L= {anb2n/n≥1}.	6 Marks	L4	CO4	PO2
	b)	Construct PDA for the language having equal number of a's and b's.	6 Marks	L4	CO4	PO2
		(OR)				
8.	a)	Convert the grammar S→ 0AA A→ 0S/1S/0 to a PDA that accepts the same language by empty stack.	6 Marks	L3	CO4	PO2
	b)	Convert the following CFG to a PDA S →aAA, A → aS/bS/a	6 Marks	L2	CO4	PO1

UNIT-V

9.	a)	Design a Turing machine to compute factorial of a give number.	6 Marks	L3	CO5	PO3
	b)	Briefly explain various types of Turing machine.	6 Marks	L2	CO5	PO1
		(OR)				
10	a)	Discuss in detail Techniques for Turing machine construction.	6 Marks	L4	CO5	PO3
.	b)	Explain about Universal Turing machine.	6 Marks	L2	CO2	PO1

CODE No.: 19BT50107 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

ENVIRONMENTAL POLLUTION AND CONTROL

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define air pollution. Describe classification of air pollutants with suitable examples.	6 Marks	L2	CO1	PO1 PO2
	b)	What are the effects of various pollutants on human health and materials?	6 Marks	L2	CO1	PO1 PO4 PO7
		(OR)				
2.	a)	Distinguish between lapse rate and inversion. Give a detailed analysis on plume behavior under various atmospheric conditions.	6 Marks	L3	CO1	PO1 PO2
	b)	Define Sound pressure, Sound power and Sound intensity. Explain the impacts of noise pollution.	6 Marks	L2	CO1	PO1 PO6

UNIT-II

3.	a)	Draw and explain the principle and working of a bag house filter. What are the applications of filters?	6 Marks	L3	CO2	PO1 PO2 PO5
	b)	Discuss any two methods for the control of gaseous pollutants.	6 Marks	L2	CO2	PO2 PO7
		(OR)				
4.	a)	Explain working of a venturi scrubber with suitable diagram.	6 Marks	L3	CO2	PO1 PO5
	b)	Suggest various measures you adopt for the control of noise pollution.	6 Marks	L4	CO2	PO1 PO2 PO3 PO7

UNIT-III

5.	a)	Draw a flow-sheet for the treatment of turbid surface water with organics. Explain functions of each unit in the flow sheet.	6 Marks	L3	CO3	PO2 PO3
	b)	Distinguish between surface water quality and ground water quality.	3 Marks	L4	CO3	PO1 PO4
	c)	Write the Permissible limits of the following parameters for Drinking water supplies: i) Fluorides ii) Turbidity iii) Chlorides iv) Hardness v) Nitrates vi) Ph.	3 Marks	L1	CO3	PO7 PO8
		(OR)				
6.	a)	Examine the importance of Aeration, Softening and Disinfection processes in water treatment.	6 Marks	L4	CO3	PO2 PO4 PO6 PO7
	b)	Describe primary and secondary treatment of wastewater.	6 Marks	L2	CO3	PO2 PO4 PO6

						PO7

UNIT-IV

7.	a)	Define soil pollution. Discuss the sources of soil pollution.	6 Marks	L2	CO4	PO1 PO4
	b)	Write short notes on the following: i) Diseases caused by soil pollution. ii) Minimization of soil pollution.	6 Marks	L2	CO4	PO1 PO2 PO6 PO7
		(OR)				
8.	a)	Explain various control measures of soil pollution.	6 Marks	L4	CO4	PO1 PO2 PO4 PO7
	b)	Outline any one case study on soil pollution.	6 Marks	L4	CO4	PO1 PO2 PO4 PO6

UNIT-V

9.	a)	Write a note on composition of municipal solid waste. What are the effects of solid waste on health and environment?	6 Marks	L2	CO5	PO1 PO2 PO6
	b)	Explain a transfer station with a neat sketch. When do you suggest transfer station?	6 Marks	L2	CO5	PO1 PO11
		(OR)				
10.	a)	Explain incineration, composting and open dumping methods of solid waste disposal.	6 Marks	L4	CO5	PO1 PO2 PO6 PO7 PO11
	b)	Write a detailed note on energy recovery from solid waste.	6 Marks	L3	CO5	PO1 PO2 PO7 PO12

CODE No.: 19BT50109 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

RURAL TECHNOLOGY

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Explain the role of rural business hubs in improving rural infrastructure.	12 Marks	L3	CO1	PO2 PO4 PO5
		(OR)				
2.		Explain the role of CAPART and NIF in rural development.	12 Marks	L4	CO1	PO2 PO4 PO5

UNIT-II

3.	a)	Define Energy. Explain the structure and working of a biogas plant. State the uses of biogas for rural development.	6 Marks	L3	CO2	PO1 PO4 PO5
	b)	State the disadvantages of incineration of biomass. Explain the significance of composting technology for effective utilization of organic wastes.	6 Marks	L2	CO2	PO1 PO4 PO5
		(OR)				
4.		Write a short note on: i) Recycling and management. ii) Wastes conservation.	12 Marks	L4	CO2	PO1 PO4 PO5 PO6

UNIT-III

5.	a)	Enlist and explain any 4 initiatives of the governments for promoting cottage industries helpful in rural economic growth.	6 Marks	L2	CO3	PO2 PO5 PO6
	b)	Write short notes on: i) Agro-based industries ii) Building and Construction technologies	6 Marks	L3	CO3	PO2 PO5 PO6 PO7
		(OR)				
6.		Discuss foods and agro based technologies which will give employment and profits to community.	12 Marks	L2	CO3	PO1 PO3 PO6 PO7

UNIT-IV

7.	a)	Justify fresh water and more particularly ground water as a precious resource with respect to its availability for human activities.	6 Marks	L2	CO4	PO1 PO2 PO4 PO5
	b)	Discuss the need for prevention of contamination of fresh water resource in rural environment. Suggest measures to ensure supply of safe drinking water in villages.	6 Marks	L3	CO4	PO1 PO2 PO4 PO5
		(OR)				

8.	a)	Write short notes on the provision of the following in rural areas. i) Drinking water. ii) Environment generating technologies.	6 Marks	L2	CO4	PO1 PO2 PO5 PO6
	b)	Discuss any two rain water harvesting technologies employed in India with suitable illustrations.	6 Marks	L2	CO4	PO1 PO2 PO5 PO7

UNIT-V

9.		Write a detailed note on: i) Saansad Adarsh Gram Yojana(SAGY). ii) Need and Necessity of technology in rural areas.	12 Marks	L6	CO5	PO4 PO5 PO6 PO7

(OR)

10.	a)	Write a detailed note on private sector participation in development of employment in rural sector.	6 Marks	L2	CO5	PO2 PO5 PO6 PO7
	b)	Write a detailed note in impact of information technology in rural development.	6 Marks	L2	CO5	PO2 PO5 PO6 PO7

CODE No.: 19BT50201 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

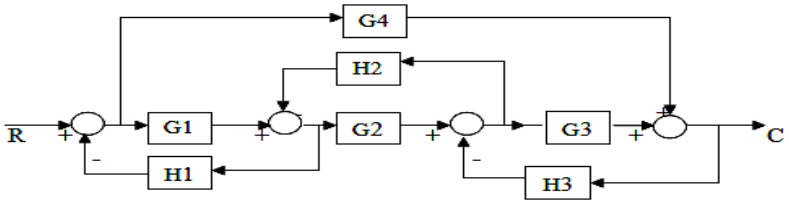
CONTROL SYSTEMS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

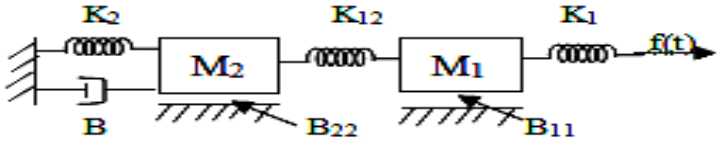
Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Develop and explain the Force-Voltage and Force-Current analogy expressions.	6 Marks	L1	CO1	PO1
	b)	Draw the signal flow graph and determine $\frac{C(S)}{R(S)}$ using Mason's gain formula for the following fig. 	6 Marks	L2	CO1	PO2

(OR)

2.	a)	Develop the expression for transfer function of Armature controlled DC servo motor. Draw the block diagram.	6 Marks	L2	CO1	PO2
	b)	Obtain Mathematical model of the mechanical system shown in fig. 	6 Marks	L2	CO1	PO2

UNIT-II

3.	a)	Derive expressions for Rise time, Peak time, Delay time and Maximum overshoot of second order under damped system with step input.	6 Marks	L1	CO2	PO1
	b)	The open loop transfer function of a unity feed back system is given by $G(S)=\frac{K}{S(TS+1)}$ where K and T are positive Constants. By what factor should be amplifier gain be reduced so that the peak over shoot of unit step response of the system is reduced from 75% to 25%.	6 Marks	L3	CO2	PO3

(OR)

4.	a)	Explain briefly about the effect of adding Proportional and Integral controllers to a control system.	6 Marks	L1	CO2	PO2
	b)	For a unity feedback system the open loop transfer function is $G(s)=\frac{10(s+2)}{s^2(s+1)}$ i) Find the positional ,velocity and acceleration error constants . ii) Steady state error when the input is $R(s)=\frac{3}{s}-\frac{2}{s^2}+\frac{1}{s^2}$.	6 Marks	L3	CO2	PO3

UNIT-III

5.		Draw the bode plot of $G(s)H(s)=\frac{250}{s(2.5+s)(10+s)}$. Find Gain Margin and Phase Margin.	12 Marks	L3	CO3	PO4
		(OR)				
6.		Explain about the advantages of root locus and determine the limiting value of gain 'K' for stability to the open loop transfer function $\frac{K}{s(1+0.1s)(1+0.2s)}$.	12 Marks	L3	CO3	PO4

UNIT-IV

7.		Consider a unity feedback system with open loop transfer function, $G(S)=\frac{20}{S(S+2)(S+4)}$. Design a PD controller so that the closed loop has a damping ratio of 0.8 and natural frequency of oscillation as 2 rad/sec.	12 Marks	L4	CO4	PO4
		(OR)				
8.		Consider a unity feedback system with open loop transfer function, $G(S)=\frac{K}{S(S+4)(S+7)}$. Design a lead compensator to satisfy the condition of Maximum peak overshoot Mp=12.63%.	12 Marks	L4	CO4	PO4

UNIT-V

9.	a)	Obtain the state model of the system whose transfer function is given by $\frac{y(s)}{u(s)}=\frac{10}{(s^2+4s^2+2s+1)}$.	6 Marks	L2	CO5	PO5
	b)	Compute the state transition matrix of a system represented by $\begin{bmatrix}\dot{x}_1\\ \dot{x}_2\end{bmatrix}=\begin{bmatrix}-3 & 1\\ -2 & 0\end{bmatrix}\begin{bmatrix}x_1\\ x_2\end{bmatrix}+\begin{bmatrix}0\\ 1\end{bmatrix}u,$	6 Marks	L3	CO5	PO5
		(OR)				
10.		Define controllability and observability. Find controllability and observability of the given System. $\begin{bmatrix}\dot{x}_1\\ \dot{x}_2\\ \dot{x}_3\end{bmatrix}=\begin{bmatrix}2 & -2 & 3\\ 1 & 1 & 1\\ 1 & 3 & -1\end{bmatrix}\begin{bmatrix}x_1\\ x_2\\ x_3\end{bmatrix}+\begin{bmatrix}11\\ 1\\ -14\end{bmatrix}[u];$ $Y=\begin{bmatrix}-3 & 5 & -2\end{bmatrix}\begin{bmatrix}x_1\\ x_2\\ x_3\end{bmatrix}.$	12 Marks	L2	CO5	PO5

CODE No.: 19BT50409 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

GREEN TECHNOLOGIES

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Define green engineering.	2 Marks	L1	CO1	PO1
	b)	Explain the significance of green engineering practices.	4 Marks	L2	CO1	PO1
	c)	Memorize any six principles of green engineering.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Explain the energy saving concepts in Green Communications.	6 Marks	L2	CO1	PO7
	b)	Discuss about extended energy model in ICT equipment.	6 Marks	L2	CO1	PO6
		UNIT-II				
3.	a)	Enumerate the adverse effects of conventional energy sources on the environment.	6 Marks	L2	CO2	PO1
	b)	Justify how the solar energy can be utilized as an alternative energy with its relative advantages and disadvantages.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	"Our first and foremost goal is to reduce our carbon footprint and keep our planet clean." Justify suitable methods to fortify the statement.	6 Marks	L2	CO2	PO7
	b)	Explain the process of bio-mass energy conversion and enumerate some applications to meet the societal needs.	6 Marks	L2	CO2	PO6
		UNIT-III				
5.	a)	Analyze how a seven step approach is applicable for enterprises to develop and implement Green IT strategy.	6 Marks	L4	CO3	PO6
	b)	Green initiatives may lead to additional cost for addressing sustainable issues. Justify.	6 Marks	L4	CO3	PO6
		(OR)				
6.	a)	What is a Smart Home? How does it help in protecting the environment?	6 Marks	L2	CO3	PO7
	b)	Develop a Green IT strategy for a Retail store.	6 Marks	L3	CO3	PO6
		UNIT-IV				
7.	a)	Explain the factors affecting sustainable development.	6 Marks	L2	CO4	PO7
	b)	Explain the planning criteria for daylight, ventilation and storm water drainage.	6 Marks	L2	CO4	PO6
		(OR)				
8.	a)	Define the term LEED. Explain in detail LEED-India rating system.	6 Marks	L2	CO4	PO8
	b)	What are the criteria for a building to be rated as one star, two star, three star, four star and five star as per GRIHA?	6 Marks	L2	CO4	PO5

UNIT-V

9.	a)	Define green manufacturing. Explain the impact of traditional manufacturing towards environment.	6 Marks	L1	CO5	PO7
	b)	Summarize the barriers of green manufacturing.	6 Marks	L2	CO5	PO2
		(OR)				
10.	a)	Discuss in detail about the strategies of green manufacturing.	6 Marks	L2	CO5	PO1
	b)	Illustrate the advantages and limitations of green manufacturing.	6 Marks	L3	CO5	PO2

CODE No.: 19BT50505 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

ETHICAL HACKING

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	What is meant by Certified Ethical Hacker (CEH)? Discuss what domains tested by CEH.	6 Marks	L1	CO1	PO1
	b)	Define Pen Test? Explain different Penetration-Testing methodologies.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	What is a Buffer Overflow attack? Discuss different Buffer Overflow vulnerabilities.	6 Marks	L1	CO1	PO6
	b)	Define worm. Explain different Common computer worms with suitable examples.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Explain any two methods social engineers use to gain access to information.	6 Marks	L3	CO2	PO1
	b)	What is a Foot prining? How to gather information through foot printing in DNS.	6 Marks	L4	CO3	PO8
		(OR)				
4.	a)	Discuss in detail different Information gathering tools.	6 Marks	L1	CO1	PO1
	b)	Define ping sweep. How to conduct ping sweep in hacking field explain with suitable examples.	6 Marks	L3	CO3	PO6
		UNIT-III				
5.	a)	What is Steganography? Discuss different Steganography technologies.	6 Marks	L2	CO2	PO1
	b)	Explain different Denial of Service (DOS) attacks.	6 Marks	L2	CO2	PO1
		(OR)				
6.	a)	Discuss in-detail different Password cracking Techniques.	6 Marks	L1	CO2	PO6
	b)	Explain different Escalating Privileges.	6 Marks	L2	CO1	PO2
		UNIT-IV				
7.	a)	Explain different vulnerabilities identified by the security tester in the OWASP.	6 Marks	L2	CO1	PO8
	b)	Explain how to hack the web server using OWASP developed the Web Goat project to think and figure out how to launch attacks in the web applications.	6 Marks	L4	CO3	PO6
		(OR)				
8.	a)	Explain the use of war driving and how it works.	6 Marks	L3	CO3	PO1
	b)	Write short notes on wireless hackers tools : i) NetStumbler. ii) Kismet.	6 Marks	L3	CO3	PO2

UNIT-V

9.	a)	What is Symmetric algorithm? Discuss different types of Symmetric algorithms and also specify disadvantages.	6 Marks	L2	CO1	PO1
	b)	Distinguish between Symmetric and Asymmetric cryptography algorithms.	6 Marks	L4	CO3	PO8
		(OR)				
10.	a)	Explain Cisco Router Configuration access modes. What Commands are used to showing configuration details?	6 Marks	L3	CO3	PO6
	b)	Describe and discuss the Cisco Router Components.	6 Marks	L1	CO2	PO2

CODE No.: 19BT51207 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

AI IN HEALTHCARE

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Elaborate on the usage of Artificial Intelligence in Healthcare.	6 Marks	L1	CO1	PO1
	b)	Write different applications of Artificial Neural Networks in Healthcare by giving your own examples.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Write some future technologies of AI and how it can be used in healthcare industry.	6 Marks	L1	CO1	PO3
	b)	Give a brief explanation about the risks involved in using AI technologies in healthcare industry and how we can mitigate them.	6 Marks	L1	CO1	PO2

UNIT-II

3.	a)	Write the applications of AI in Dentistry, Orthopedics and Ophthalmology in an elaborative manner.	6 Marks	L3	CO2	PO3
	b)	Give an application of AI in dermatology by considering an example on your own.	6 Marks	L2	CO2	PO3
		(OR)				
4.	a)	Describe briefly about the applications of AI in Psychiatry and Cardiology.	6 Marks	L2	CO2	PO2
	b)	Compare and Contrast usages of AI in Surgery and Anesthesiology.	6 Marks	L3	CO2	PO3

UNIT-III

5.	a)	Write different features of IBM Watson in healthcare in your words by giving examples.	6 Marks	L2	CO3	PO2
	b)	Give the role of Google and Deep Mind applications of Artificial Intelligence in health care.	6 Marks	L3	CO3	PO4
		(OR)				
6.	a)	How Baidu and Facebook technologies can be used in dealing with diseases in Healthcare.	6 Marks	L2	CO3	PO5
	b)	Give a brief note on how major corporations like Microsoft use AI technology to different healthcare applications.	6 Marks	L1	CO3	PO3

UNIT-IV

7.	a)	How virtual assistants are used in healthcare applications as future technologies of AI?	6 Marks	L2	CO4	PO5
	b)	Write a short note on medication adherence and how Artificial Intelligence technologies can be used in accessible diagnostic tests.	6 Marks	L2	CO4	PO3

(OR)

8.	a)	What do you mean by Incentivized wellness and give a brief explanation about AI technology can be used to increase productivity?	6 Marks	L2	CO4	PO4
	b)	Differentiate between Innovation and Deliberation with your examples. Explain it with reference to AI applications.	6 Marks	L2	CO4	PO3

UNIT-V

9.	a)	Consider a case study on usage of Neural Networks as an AI application to check whether a patient is disease prone or not by considering the choice of disease on your own.	6 Marks	L2	CO5	PO2
	b)	Give a brief explanation about of how AI can be used Imaging of Diabetic foot Concerns and prioritization of referrals for improving in Morbidity and Mortality.	6 Marks	L2	CO5	PO4

(OR)

10.	a)	Discuss thoroughly AI based application on Type-2 Diabetes self management.	6 Marks	L2	CO5	PO2
	b)	Describe about a case study on delivering a scalable and engaging digital therapy with your own words.	6 Marks	L3	CO5	PO3

CODE No.: 19BT4HS01 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC19) Supplementary Examinations January – 2022

BANKING AND INSURANCE

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

	UNIT-I				
1.	Enumerate and elucidate various functions of banking.	12 Marks	L3	CO1	PO3
	(OR)				
2.	"Is printing of higher denomination currency unfavorable indicator of the economic position" Examine.	12 Marks	L3	CO2	PO5 PO3
	UNIT-II				
3.	Give a brief note on types of accounts.	12 Marks	L3	CO1	PO3
	(OR)				
4.	"Retaining the existing customers is far better than attracting new customers for a bank" Critically analyze the factors influencing banker-customer relationship.	12 Marks	L3	CO2	PO5 PO12
	UNIT-III				
5.	Explain various e-payment systems in detail.	12 Marks	L3	CO1	PO3 PO12
	(OR)				
6.	Describe briefly the role of tenders in B2G model.	12 Marks	L3	CO1	PO3
	UNIT-IV				
7.	Compare Risk *Vs* Uncertainty.	12 Marks	L3	CO2	PO5 PO12
	(OR)				
8.	"Insurance can be used as an Investment avenue". Comment.	12 Marks	L3	CO2	PO5 PO12
	UNIT-V				
9.	How does life insurance differ from general insurance?	12 Marks	L3	CO1	PO3
	(OR)				
10.	Evaluate the role of private insurance players in Indian Insurance markets.	12 Marks	L3	CO2	PO3 PO5

❀ ❀ ❀

CODE No.: 19BT4HS11 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC19) Supplementary Examinations January – 2022

PROFESSIONAL ETHICS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the scope and aims of Engineering Ethics.	6 Marks	L2	CO1	PO1
	b)	Explain the senses of Engineering Ethics.	6 Marks	L2	CO3	PO8
		(OR)				
2.		Where and how do Moral problems arise in engineering?	12 Marks	L2	CO3	PO8
		UNIT-II				
3.	a)	Discuss briefly the differences between a professional and an amateur.	6 Marks	L4	CO2	PO2
	b)	Explain the term 'professional accountability' with examples.	6 Marks	L4	CO1	PO1
		(OR)				
4.		Explain briefly the terms 'profession' and 'professional' with suitable examples.	12 Marks	L2	CO1	PO1
		UNIT-III				
5.	a)	Explain the meaning of Accountability in the engineering context.	6 Marks	L2	CO2	PO2
	b)	Define 'conscientiousness'.	6 Marks	L2	CO1	PO1
		(OR)				
6.		Compare and contrast engineering experiments with standard experiments.	12 Marks	L4	CO2	PO2
		UNIT-IV				
7.	a)	Define 'loyalty' and 'confidentiality'.	6 Marks	L2	CO1	PO1
	b)	What is meant by 'discrimination' and give an example?	6 Marks	L2	CO1	PO1
		(OR)				
8.		Explain the conditions that have to be met before a professional can be justified in blowing the whistle.	12 Marks	L4	CO2	PO2
		UNIT-V				
9.	a)	Explain the role of engineers as managers.	6 Marks	L2	CO1	PO1
	b)	Explain the meaning of environmental ethics.	6 Marks	L2	CO3	PO8
		(OR)				
10.		What is meant by 'morally creative leaders' and participation in professional societies?	12 Marks	L2	CO3	PO8

CODE No.: 19BT31202 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations January – 2022

SOFTWARE ENGINEERING

[Computer Science and Engineering, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Sketch and explain Evolutionary Process model.	6 Marks	L1	CO1	PO1
	b)	Explain about Agile Unified Process (AUP).	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Describe a process framework in your own words. When we say that framework activities are applicable to all projects, does this mean that the same work tasks are applied for all projects, regardless of size and complexity? Explain.	6 Marks	L3	CO1	PO3
	b)	Explain Incremental Model with a neat sketch.	6 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Examine how mathematical notations can be used to express a functional requirement in it and explain with examples.	6 Marks	L2	CO2	PO5
	b)	What is the Use Case technique of requirement elicitation? Describe its components.	6 Marks	L1	CO2	PO1
		(OR)				
4.		Explain in detail about four activities involved in Requirements Engineering process.	12 Marks	L1	CO2	PO1
		UNIT-III				
5.	a)	Design use case diagram for ATM application.	6 Marks	L3	CO3	PO3
	b)	Construct and explain the exceptional messages in sequence diagram.	6 Marks	L1	CO3	PO1
		(OR)				
6.	a)	Explain in detail about Process Metrics.	6 Marks	L1	CO3	PO1
	b)	Design a sequence diagram that models the data processing involved when a customer withdraws cash from the bank ATM machine.	6 Marks	L3	CO3	PO3
		UNIT-IV				
7.		Discuss at least three examples in which black-box testing might give the impression that "everything's OK," while white-box tests might uncover an error. Give at least three examples in which white-box testing might give the impression that "everything's OK," while black-box tests might uncover an error.	12 Marks	L2	CO4	PO2
		(OR)				
8.		The concept of "antibugging" is an extremely effective way to provide built-in debugging assistance when an error is uncovered: i) Develop a set of guidelines for antibugging. ii) Discuss advantages of using the technique iii) Discuss disadvantages.	12 Marks	L2	CO4	PO2

UNIT-V

9.	a)	Explain the measures of Availability and Reliability.	6 Marks	L1	CO5	PO1
	b)	Discuss the steps involved in Business process engineering model with a neat sketch.	6 Marks	L1	CO5	PO1

(OR)

10.	a)	Define SQA. List and explain SQA activities.	6 Marks	L1	CO5	PO1
	b)	Design a risk information sheet by refine "Delivery deadline will be tightened" risk.	6 Marks	L3	CO5	PO3

CODE No.: 19BT31502 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, January - 2022

OPERATING SYSTEMS

[Information Technology]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain about services of operating systems.	6 Marks	L2	CO1	PO1
	b)	Discuss about hybrid operating systems.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Describe inter process communication with neat diagram.	6 Marks	L2	CO1	PO1
	b)	Consider the following set of processes that arrive at time 0 with the length of the CPU burst time given in milliseconds.	6 Marks	L3	CO1	PO4

Process	Burst Time
P1	24
P2	3
P3	3

Draw the Gnatt chart using FCFS and Round Robin Scheduling Algorithm. Calculate the average waiting time in both cases.

Note: Take time quantum = 4ms.

Analyze which of the algorithm results in minimum average waiting time.

UNIT-II

3.	a)	Define Race Condition. With pseudo code, present the Peterson's solution for critical section problem.	6 Marks	L4	CO2	PO3
	b)	Using monitors, explain solution for Producer-Consumer classical synchronization problem.	6 Marks	L3	CO2	PO5
		(OR)				
4.	a)	Describe the methods for handling for deadlocks.	6 Marks	L2	CO3	PO1
	b)	Suppose there are four processes in execution with 12 instances of resources R in a system. The maximum need of each process and current allocation are given below:	6 Marks	L3	CO3	PO3

Process	Max need	Allocation
P1	8	3
P2	9	4
P3	5	2
P4	3	1

Find out the safe sequence.

UNIT-III

5.	a)	Compare the segmented paging scheme with the hashed page table scheme for handling large address spaces. Under what circumstances is one scheme preferable to the other.	6 Marks	L4	CO4	PO2
	b)	Discuss about memory protection in segmentation with paging.	6 Marks	L2	CO4	PO1
		(OR)				
6.	a)	Describe optimal page replacement algorithm with neat diagram.	6 Marks	L2	CO4	PO2

	b)	Discuss the hardware support required for demand paging.	6 Marks	L3	CO4	PO1
		UNIT-IV				
7.	a)	Compare file allocation methods in operating systems.	6 Marks	L4	CO5	PO2
	b)	What are the advantages and disadvantages of contiguous allocation and linked allocation?	6 Marks	L2	CO5	PO1
		(OR)				
8.	a)	Explain characteristics of I/O devices.	6 Marks	L2	CO6	PO1
	b)	Describe the services provided by kernel I/O subsystem.	6 Marks	L4	CO6	PO1
		UNIT-V				
9.	a)	Describe the several methods of implementing access matrix.	6 Marks	L2	CO6	PO1
	b)	Analyze the schemes that are used to implement revocation for capabilities.	6 Marks	L4	CO6	PO4
		(OR)				
10.	a)	Explain the various questions that arise in revocation of access rights.	6 Marks	L2	CO6	PO2
	b)	Write a short note on user authentication.	6 Marks	L2	CO6	PO2

CODE No.: 19BT40103 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC19) Supplementary Examinations January - 2022

HYDRAULIC ENGINEERING

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What boundary condition must be satisfied by the velocity distribution in laminar boundary layer over a plate with a neat sketch and mention any two practical applications?	6 Marks	L2	CO1	PO1 PO10
	b)	The velocity distribution in the boundary layer is given by: $u/U = (y/\delta)^{1/7}$, where u is the velocity at a distance y from the plate and u = U at y = δ, δ being boundary layer thickness. Find: i) The displacement thickness. ii) The momentum thickness. iii) The energy thickness. iv) The value of δ*/q.	6 Marks	L4	CO1	PO1 PO2 PO4 PO10
		(OR)				
2.	a)	Derive an expression for Von Karman momentum integral equation with a neat sketch.	6 Marks	L4	CO1	PO1 PO2 PO4 PO10
	b)	On a flat plate of 2 m (length) x 1 m (width), experiments were conducted in a wind tunnel with a wind speed of 50 km/h. The plate is kept at such an angle that the coefficients of drag and lift ate 0.18 and 0.9 respectively. Determine: i) Drag force. ii) Lift force. iii) Resultant force. iv) Power exerted by the air stream on the plate. Take density of air = 1.15 kg/m^3	6 Marks	L4	CO1	PO1 PO2 PO4 PO5 PO10

UNIT-II

3.	a)	Calculate the specific energy of 12 m^3/s of water flowing with a velocity of 1.5 m/s in a rectangular channel 7.5 m wide. Find the depth of water in the channel when the specific energy would be minimum. Identify the value of critical velocity as well as minimum specific energy.	6 Marks	L6	CO2	PO1 PO2 PO3 PO4 PO6 PO7 PO10
	b)	A triangular gutter, whose sides include an angle of 60°, conveys water at a uniform depth of 250 mm. If the discharge is 0.04m^3/s, determine the gradient of the trough. Use the Chezy's formula assuming that C = 52.	6 Marks	L6	CO2	PO1 PO2 PO3 PO4 PO5 PO6 PO7

						PO10
		(OR)				
4.	a)	A 8 m wide channel conveys 15 m^3/s of water at a depth of 1.2m. Calculate: i) Specific energy of the flowing water. ii) Critical depth, critical velocity and minimum specific energy. iii) Froude number and state whether flow is subcritical or supercritical.	6 Marks	L6	CO2	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO10
	b)	A trapezoidal channel with side slopes 1 to 1 has to be designed to carry 10 m^3/s at a velocity of 2 m/s so that the amount of lining of concrete for bed and sides is minimum. Calculate the area of lining required for one meter length of the channel.	6 Marks	L6	CO2	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO10
		UNIT-III				
5.	a)	A jet of water having a velocity of 40 m/s strikes a curves vane which is moving with a velocity of 20 m/s. The jet makes an angle of 30° with the direction of motion of vane at inlet and leaves at an angle of 90° to the direction of motion of vane at outlet. i) Draw the velocity triangles at inlet and outlet. ii) Identify the vane angles at inlet and outlet so that the water enters and leaves the vane without shock.	6 Marks	L4	CO3	PO1 PO2 PO4 PO6 PO10
	b)	A 75 mm diameter jet having a velocity of 30 m/s strikes a flat plate, the normal of which is inclined at 45° to the axis of the jet. Find the normal pressure on the plate, i) When the plate is stationary. ii) When the plate is moving with a velocity of 15 m/s in the direction of jet, away from the jet. Also determine the power and efficiency of the jet when the plate is moving.	6 Marks	L4	CO3	PO1 PO2 PO4 PO6 PO10
		(OR)				
6.	a)	A jet of water having a velocity of 35 m/s impinges on a series of vanes moving with a velocity of 20 m/s. The jet makes an angle of 30° to the direction of motion of vanes when entering and leaves at an angle of 120°. Draw the triangles of velocities at inlet and outlet and find: i) The angles of vanes tips so that water enters and leaves without shock. ii) The work done per N of water entering the vanes. iii) The efficiency.	6 Marks	L4	CO3	PO1 PO2 PO4 PO6 PO10
	b)	State Impulse Momentum Principle. Derive an expression for impact of jet of liquid on a fixed vertical plate. Find the force exerted by a 4 cm diameter water jet directed against a flat plate held normal to the jet, if the jet is discharging 60 litres of water per second.	6 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO10

UNIT-IV

7.	a)	A Pelton wheel is required to develop 8825 kW when working under the head of 300m. The speed of the Pelton wheel is 540 rpm. The coefficient of velocity for the jet is 0.987, speed ratio is 0.46. Assuming the jet ratio as 10 and overall efficiency as 84%. Estimate: i) Number of jets. ii) Diameter of the wheel. iii) Quantity of water required.	6 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO10
	b)	i) Sketch Francis turbine and explain the parts of the turbine. ii) A Kaplan turbine develops 22000 kW at an average head of 35 m. Assuming a speed ratio of 2, flow ratio of 0.6, diameter of the boss equal to 0·35 times the diameter of the runner and an overall efficiency of 88 per cent, calculate the diameter, speed and specific speed of the turbine.	6 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO10

(OR)

8.	a)	i) Draw and explain the characteristics curve of turbines with a neat sketch. ii) Explain the various efficiencies of hydraulic turbines.	6 Marks	L2	CO4	PO1 PO10
	b)	A reaction turbine works at 450 r.p.m. under a head of 120 m. Its diameter at inlet is 1.2 m and the flow area is 0.4 m². The angles made by absolute and relative velocities at inlet are 20° and 60° respectively with the tangential velocity. Determine: i) The volume flow rate. ii) The power developed. iii) The hydraulic efficiency.	6 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO10

UNIT-V

9.	a)	The impeller of a centrifugal pump has an external diameter of 450 mm and internal diameter of 200 mm and it runs at 1440 r.p.m. Assuming a constant radial flow through the impeller at 2.5 m/s and that the vanes at exit are set back at an angle 25°, determine: i) Inlet vane angle. ii) The angle, absolute velocity of water at exit makes with the tangent. iii) The work done per N of water.	6 Marks	L6	CO5	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO10
	b)	A centrifugal pump running at 800 r.p.m. is working against a total head of 20.2 m. The external diameter of the impeller is 480 mm and outlet width 60 mm. If the vanes angle at outlet is 40° and manometric efficiency is 70 percent, determine: i) Flow velocity at outlet. ii) Absolute velocity of water leaving the vane. iii) Angle made by the absolute velocity at outlet with the direction of motion at outlet. iv) Rate of flow through the pump.	6 Marks	L6	CO5	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO10

(OR)

10.	a)	Draw the sketch of reciprocating pump and mention its components. Distinguish the working of single-acting and double-acting reciprocating pump, in detail.	6 Marks	L4	CO5	PO1 PO2 PO10
	b)	A single-acting reciprocating pump having a bore of 150 mm and a stroke of 300 mm is raising water to height of 20 m above the sump level. The pump has an actual discharge of 0.0052 m^3/s. The efficiency of the pump is 70%. If the speed of pump is 60 r.p.m, determine: i) Theoretical discharge. ii) Theoretical power. iii) Actual power. iv) Percentage slip.	6 Marks	L4	CO5	PO1 PO2 PO3 PO4 PO5 PO10

CODE No.: 19BT40104 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, January - 2022

SOIL MECHANICS

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What is clay mineralogy? Explain the different types of clay minerals with neat sketches.	6 Marks	L2	CO1	PO1 PO10
	b)	List various latest methods to determine field density. Derive the relation between γ_b, γ_w, G, S_r and e for bulk unit weight of soil in terms of void ratio.	6 Marks	L4	CO1	PO1 PO2 PO12
		(OR)				
2.	a)	A proposed embankment fill requires 5000 m^3 of compacted soil. The void ratio of compacted fill is specified as 0.70. Four borrow area soils are available as described in the following table.	6 Marks	L4	CO1	PO1 PO2 PO4 PO6 PO7 PO10 PO11

Borrow area	Void ratio	Cost of transportation Rs./m^3	Cost of excavation Rs./m^3
A	0.85	450	25
B	1.20	300	25
C	0.95	350	25
D	0.75	500	25

Make the necessary calculations to select the borrow area from which the soil should be brought to minimize the cost. Let specific gravity of all four soils equal to 2.70.

	b)	i) Explain the procedure for determination of liquid limit test as per IS 2720. ii) The liquid limit, plastic limit and natural moisture content of soil are given as 50%, 35% and 25%. What will be the values of plasticity index, liquidity index, and consistency index?	6 Marks	L4	CO1	PO1 PO2 PO8

UNIT-II

3.	a)	Explain the procedure of constant head permeability test with a neat sketch.	6 Marks	L2	CO2	PO1 PO5 PO8 PO10
	b)	Explain the Darcy's law and its validity for flow of water through soil. Determine the discharge velocity if the coefficient of permeability is $1x10^{-3}$ cm/sec and the head loss for 3 m length of soil is 2.5 m.	6 Marks	L4	CO2	PO1 PO2
		(OR)				
4.	a)	What is meant by effective stress? In a three layered soil deposit of equal thickness of 2 m each. The density of soil for top two layers is γ_d=16 KN/m^3 and for the last layer of soil is γ_{sat}=18.5 KN/m^3. Calculate the effective stress at the bottom surface of the last layer if the water table is located at a depth of 4 m from the ground level.	6 Marks	L4	CO2	PO1 PO2 PO4 PO10

	b)	What is quicksand condition? Derive the equation for critical hydraulic gradient. What is factor of safety against piping failure?	6 Marks	L4	CO2	PO1 PO2 PO6

UNIT-III

5.	a)	What is meant by contact pressure? Draw the contact pressure distribution diagrams for both flexible and rigid footings.	4 Marks	L2	CO3	PO1 PO10
	b)	Distinguish between light weight compaction and heavy weight compaction. What are the factors affecting compactions of soils?	8 Marks	L4	CO3	PO1 PO2 PO8

(OR)

6.	a)	Write short notes on an isobar diagram. A line load of 150 kN/m is acting on the ground surface along the y-axis. Determine the vertical stress at a point P which is at a depth of 5 m and at a horizontal distance of 2.5 m below the line load.	6 Marks	L4	CO3	PO1 PO2 PO10
	b)	The following results were obtained from a IS light weight compaction test on sample of soil. Plot compaction curve. Hence obtain the values of OMC and MDD. Also calculate void ratio, degree of saturation and theoretical maximum dry density for all water contents. Take G=2.65.	6 Marks	L4	CO3	PO1 PO2 PO4 PO10

Water content (%)	0.12	0.14	0.18	0.21	0.24
Mass of wet soil (kg)	1.65	1.95	1.93	1.90	1.86

UNIT-IV

7.	a)	With neat sketch, explain the spring analogy model for understanding the primary consolidation of soils.	6 Marks	L2	CO4	PO1 PO5 PO10
	b)	A soil stratum is 10 m thick with pervious stratum at top and bottom. The properties of soil are given as K= 10^{-7} cm/s, a_v= 0.0003 cm²/gm, e= 1.5. Determine the time required for 50% of consolidation.	6 Marks	L4	CO4	PO1 PO2 PO4

(OR)

8.	a)	What are the graphical methods for determination of coefficient of consolidation? Explain any one.	6 Marks	L4	CO4	PO1 PO5 PO10
	b)	A square footing 1.5 m x 1.5 m is founded in a normally consolidated clayey soil at a depth of 2 m from the ground surface. The column load acting on the footing is 600 kN. The properties of the soil are γ=17 kN/m³, γ_{sat}=19 kN/m³, C_C=0.4, e=0.8, c=35 kN/m² and ϕ =20°. The hard rock stratum is at the depth of 6 m from the ground surface which is entirely overlain by clay. Determine the primary consolidation settlement by considering that water table is located at the depth of 1.5 m from the base of the footing.	6 Marks	L4	CO4	PO1 PO2 PO4 PO6 PO10

UNIT-V

9.	a)	What are the factors affecting the shear strength of cohesive soils?	6 Marks	L1	CO5	PO1
	b)	A torque of 42 Nm was applied to shear natural saturated clay in an in-situ vane shear test. The diameter and length of the vane are 50 mm and 100 mm. Determine the undrained shear strength of the clay. The torque required to shear the same soil in remolded condition is 35 Nm. What will be the sensitivity of the soil?	6 Marks	L4	CO5	PO1 PO2 PO5

(OR)

10.	a)	What are the different drainage conditions of shear tests? Write about Skempton's pore pressure coefficients.	6 Marks	L2	CO5	PO1
	b)	A direct shear test was performed on a 6 cm × 6 cm sample of dry sand. The normal load was 360 N. The failure occurred at a shear load of 180 N. Plot the Mohr strength envelope and determine ø. Also determine the principal stresses at failure.	6 Marks	L4	CO5	PO1 PO2 PO10

CODE No.: 19BT40105 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC19) Supplementary Examinations January – 2022

STRUCTURAL ANALYSIS

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Derive the expression for slope and deflection of a cantilever beam of length 'l' subjected to a concentrated load 'W' at the free end.	6 Marks	L4	CO1	PO1 PO2 PO10
	b)	A girder of uniform cross section and constant depth is freely supported over a span of 3 metres. If the point load at the mid-span is 20 kN and moment of inertia is $15.614 \times 10^{-6} m^4$. Calculate the central deflection and the slopes at the ends of the beam. Take E = 200 GN/m^2.	6 Marks	L4	CO1	PO1 PO2 PO4 PO10
		(OR)				
2.		A steel girder of uniform section, 10 m long is simply supported at its ends. It carries concentrated loads 50 kN and 30 kN at two points 2 m and 3 m from the two ends respectively. Calculate the deflection of the girder at the points under the two loads and the maximum deflection. Take E = 200 GN/m^2.	12 Marks	L4	CO1	PO1 PO2 PO4 PO10
		UNIT-II				
3.		A simply supported beam of span 12 m shown in Fig.1 is loaded with 40 kN loads at C, D and E. Determine the vertical deflection at D. Take EI= 20000 kNm^2.	12 Marks	L4	CO1	PO1 PO2 PO4 PO10

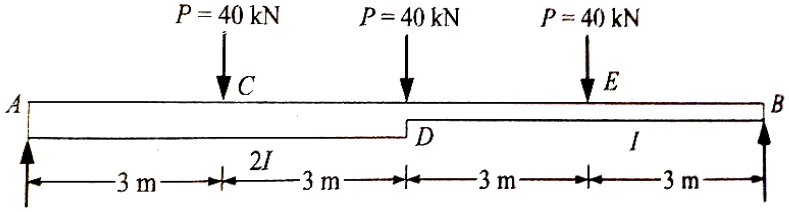


Fig.1

(OR)

4.	A fixed beam of 5 m span carries a point load of 150 kN at 3 m from the left end. If the right end sinks by 10.5 mm, find the fixing moments as well as reactions at the supports. Take E = 2×10^8 kN/m^2 and I = 10000 cm^4.	12 Marks	L4	CO2	PO1 PO2 PO4 PO10
	UNIT-III				
5.	A continuous beam ABCD having three equal spans of length 'l' each. It carries a uniformly distributed load w/unit length over its entire length. It is freely supported on all supports, which are at the same level. Draw the B.M. and S.F. diagrams for this beam.	12 Marks	L4	CO3	PO1 PO2 PO4 PO10
	(OR)				

6.		Analyse the continuous beam ABCD shown in Fig.2 by slope deflection method and draw the bending moment diagram.	12 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO10

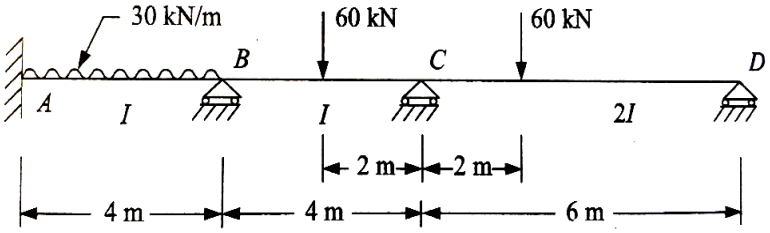


Fig.2

UNIT-IV

7.		Analyse the continuous beam shown in Fig.3 using moment distribution method.	12 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO10

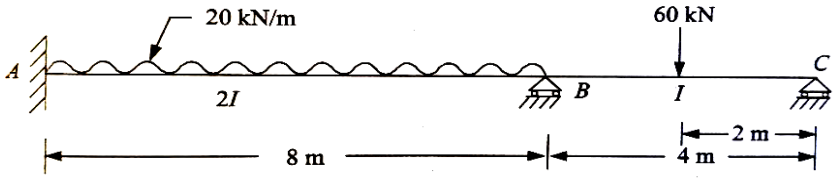


Fig.3

(OR)

8.		Analyse the continuous beam shown in Fig.4 by Kani's method. Flexural rigidity is constant throughout.	12 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO10

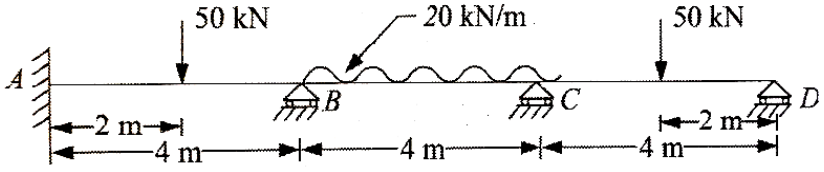


Fig.4

UNIT-V

9.		A train of 5-wheel loads 60 kN, 80 kN, 200 kN, 130 kN and 120 kN spaced 2.5 m between the consecutive loads crosses a beam of span 22.5 m with 120 kN load leading. Calculate the maximum positive and negative shear force values at the centre of the span and the absolute maximum bending moment anywhere in the span. Use Influence Lines method.	12 Marks	L4	CO4	PO1 PO2 PO4 PO10

(OR)

10.	a)	Define plastic hinge and plastic moment capacity.	4 Marks	L4	CO5	PO1 PO2
	b)	Determine the shape factor for the rectangular and circular section.	8 Marks	L4	CO5	PO1 PO2 PO6 PO10

CODE No.: 19BT40201 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations January – 2022

DIGITAL ELECTRONICS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Express the following expression in standard sum of products form. **F(A,B,C,D) =(AB) 'D+ABC'D'+A'BD+ABCD'**.	4 Marks	L1	CO1	PO1
	b)	Simplify the following expressions using K-Map. i) **F=A'B'C'D+AB'C'D +A'B'CD +ABCD'+AB'CD'+A'B'C'D.** ii) **F(A,B,C,D) = Σm(5,6,7,12,13) + Σd(4,9,14,15).**	8 Marks	L3	CO1	PO5
		(OR)				
2.	a)	Design the following Boolean function using NAND Gates. $F = \bar{W}\bar{X}Z + WXZ + \bar{X}\bar{Y}Z + WXY\bar{Z}$.	6 Marks	L2	CO1	PO3
	b)	Minimize the following Boolean expressions using Karnaugh map method. **F(W,X,Y,Z)=Σm(1,3,4,5,6,11,12,13,15)** . **F(A,B,C,D) = Σm(4,5,7,12,13,14)+ Σd(1,9,11,15).**	6 Marks	L3	CO1	PO5
		UNIT-II				
3.	a)	Design a four bit decimal adder circuit for digital processing.	8 Marks	L2	CO2	PO3
	b)	Construct a 4 x 16 decoder using 3 x 8 decoders for data processing application.	4 Marks	L3	CO2	PO5
		(OR)				
4.	a)	Design and construct a 3 x 3 bit binary multiplier circuit.	6 Marks	L2	CO2	PO3
	b)	Construct a 5-to-32 decoder using one 2-to-4 and four 3-to-8 decoders.	6 Marks	L3	CO2	PO4
		UNIT-III				
5.	a)	Illustrate how JK flip-flop can be converted to SR flip-flop.	6 Marks	L2	CO3	PO1
	b)	Apply D-flip-flop to design a counter with the following repeated binary sequence: 0, 1, 2, 4, 6.	6 Marks	L3	CO3	PO4
		(OR)				
6.		Design a modulo-12 synchronous counter using T flip-flops.	12 Marks	L3	CO3	PO3
		UNIT-IV				
7.	a)	Distinguish Mealy and Moore circuits.	4 Marks	L2	CO4	PO1
	b)	A sequential circuit has two JK flip-flops A and B and one input 'X'. The circuit is described by the following flip-flop input equations: $J_A = x \quad K_A = B'$ $J_B = x \quad K_B = A$ Derive the state equations A(t+1) and B(t+1) by substituting the input equations for the *J* and *K* Variables and also draw the state diagram of the circuit. Design a logic diagram for the following sequence 101 using D-flip-flops.	8 Marks	L4	CO4	PO4
		(OR)				

8.		Minimize sequential machine represented by the state table shown below using merger table	12 Marks	L2	CO4	PO5

Table

Present State	Next State , Z	
	X=0	X=1
A	B,1	H,1
B	F,1	D,1
C	D,0	E,1
D	C,0	E,1
E	D,1	C,1
F	C,1	C,1
G	C,1	D,1
H	C,0	A,1

UNIT-V

9.		Analyze the following Boolean functions using PAL with AND-OR structure F_1 (A,B,C,D)=∑m(2,12,13) F_2 (A,B,C,D)=∑m(7,8,9,10,11,12,13,14,15) F_3 (A,B,C,D)=∑m(0,2,3,4,5,6,7,8,10,11,15) F_4 (A,B,C,D)=∑m(1,2,8,12,13)	12 Marks	L4	CO5	PO2

(OR)

10.	a)	Briefly explain the binary multiplication and division algorithm.	6 Marks	L2	CO5	PO1
	b)	Perform the arithmetic operations using 2's complement method. i) (+52) + (-13). ii) (24) + (14).	6 Marks	L2	CO5	PO2

CODE No.: 19BT40202 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC19) Supplementary Examinations January - 2022

ELECTRICAL MACHINES-II

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	How the rotating magnetic field in a three phase induction motor does makes the motor a self-starting?	6 Marks	L2	CO1	PO1
	b)	A 3-phase, 400 V, 50 Hz induction motor takes a power input of 35 kW at its full load speed of 980 r.p.m. The total stator losses are 1 kW and the friction and wind age losses together are 1.5 kW. Calculate: i) slip. ii) Rotor Ohmic losses. iii) shaft power.	6 Marks	L3	CO1	PO4
		(OR)				
2.	a)	Obtain the relation between rotor input, rotor copper losses and rotor output in terms of slip(s).	6 Marks	L2	CO1	PO1
	b)	What are the advantages and disadvantages of wound rotor type induction motor?	6 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Suggest a suitable induction machine for the following applications. i) Agriculture pump sets. ii) Wind mills. Justify your suggestion.	6 Marks	L2	CO1	PO6
	b)	An 8-pole, 50 Hz, 3-ϕ slip ring induction motor has effective resistance of 0.08Ω/phase. The speed corresponding to maximum torque is 650 r.p.m. What is the value of resistance to be inserted in rotor circuit to obtain maximum torque at starting?	6 Marks	L3	CO1	PO4
		(OR)				
4.	a)	Estimate the starting torque as a percentage of full-load torque for a 3-phase Induction motor for the following methods of starting: i) Direct on line. ii) Star-Delta. iii) Autotransformer which limits the starting current to twice the full load current. The full load slip is 0.03 and the short-circuit current is six times the full-load current.	9 Marks	L3	CO1	PO2
	b)	Suggest a suitable speed control method/technique for controlling the speed of induction motor used for: i) high speed, low torque. ii) low speed, high torque applications.	3 Marks	L3	CO1	PO5

UNIT-III

5.	a)	Explain the principle of operation of a synchronous generator. Also, enumerate the advantages of rotating field system.	7 Marks	L2	CO2	PO1
	b)	A 4-pole, 50 Hz star connected alternator has 6 slots per pole per phase and a two layer winding with 4 conductors per slot. If the coil span is 150^0, find the no–load terminal emf if the flux per pole is 300 mWb.	5 Marks	L3	CO2	PO2

(OR)

6.	a)	Define voltage regulation and explain its significance.	4 Marks	L1	CO2	PO1
	b)	How does the voltage regulation of salient alternator can be found by two reaction theory?	8 Marks	L2	CO2	PO1

UNIT-IV

7.	a)	What is meant by synchronization? Explain the way of synchronizing an alternator to the infinite bus bars.	6 Marks	L2	CO3	PO1
	b)	The EMFs of two alternators are $3000\angle 20^0$ V and $2900\angle 20^0$ V. Their synchronous impedances are (2+j20) Ω/phase and (2.5+j30) Ω/phase. The load impedance is (10+j4) Ω/phase. Find the circulating current.	6 Marks	L3	CO3	PO2

(OR)

8.	a)	Explain the conditions that must be fulfilled for parallel operation of two synchronous generators.	5 Marks	L1	CO3	PO1
	b)	A 12 kVA, 440V, 50 Hz, star connected synchronous generator supplies rated load at 0.8 power factor lagging. The armature resistance and synchronous reactance are 0.3Ω and 8Ω respectively. Determine the torque angle and the voltage regulation.	7 Marks	L3	CO3	PO2

UNIT-V

9.	a)	Draw and explain the phasor diagrams of synchronous motor for unity, leading and lagging power factor conditions.	6 Marks	L2	CO4	PO1
	b)	A three-phase, 11 kV, star-connected synchronous motor is taking 60 A current at 0.8 p.f. lead. Its impedance is Z=1+j30Ω/phase. Calculate i) power input. ii) back emf. iii) mechanical power developed.	6 Marks	L3	CO4	PO2

(OR)

10.	a)	Discuss the factors affecting the sustainable operation of synchronous motor.	6 Marks	L2	CO4	PO7
	b)	Discuss any two methods/techniques for starting of synchronous motors.	6 Marks	L1	CO4	PO5

CODE No.: 19BT40203 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, January – 2022

ELECTRICAL MEASUREMENTS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Two quantities x_1 and x_2 have limiting errors of $\pm\delta x_1$ and $\pm\delta x_2$ respectively. Derive the expression for relative limiting error in X when, i) $X= x_1+x_2$ ii) $X= x_1- x_2$ iii) $X= x_1*x_2$ iv) $X= x_1/x_2$	6 Marks	L2	CO1	PO2
	b)	A basic d'Arsonval movement with a full scale reading of 50 μA and an internal resistance of 1800 Ω is available. It is to be converted into a 0-1 V, 0-10 V, 0-50 V and 0-150 V. Design multi range voltmeter using individual multipliers for each range. Calculate the value of individual multipliers.	6 Marks	L3	CO1	PO3
		(OR)				
2.	a)	List the static characteristics of measuring instruments and describe in detail the desirable characteristics of instruments with suitable examples.	6 Marks	L2	CO1	PO1
	b)	Explain in detail about the various appropriate supporting techniques used in moving system of the measuring instruments to avoid the frictional errors.	6 Marks	L2	CO1	PO5

UNIT-II

3.	a)	Explain in detail the construction and working of three phase Electrodynamometer type power factor meter with a neat sketch.	6 Marks	L3	CO2	PO1
	b)	Enumerate the sources of errors in single phase induction type energy meters and suggest the suitable compensations techniques used to minimize the errors.	6 Marks	L3	CO2	PO1
		(OR)				
4.	a)	A 230 V, single phase watt-hour has a constant load of 4 A passing through it for 6 hours at unity power factor. If the meter disc makes 2208 revolutions during this period. What is the meter constant in revolutions per kWh? Calculate the power factor of the load if the number of revolutions made by the meter is 1472 when operating at 230 V and 5A for 4 hours.	6 Marks	L2	CO2	PO4
	b)	Derive the torque equation for an EDM type wattmeter. Comment upon the shape of scale if spring control is used.	6 Marks	L3	CO2	PO1

UNIT-III

5.	a)	Define the term standardization. With neat sketch, describe the construction and working of Crompton potentiometer in detail.	6 Marks	L2	CO3	PO8
	b)	Calibrate the PMMC ammeter, voltmeter and also measurement of unknown resistance used in laboratories and industrial applications using DC potentiometers.	6 Marks	L4	CO3	PO6
		(OR)				

6.	a)	Describe the construction and working of a polar type potentiometer.	6 Marks	L2	CO3	PO1
	b)	With a neat illustration, discuss the standardization procedure using the transfer instrument and the phase shift transformer.	6 Marks	L2	CO3	PO8

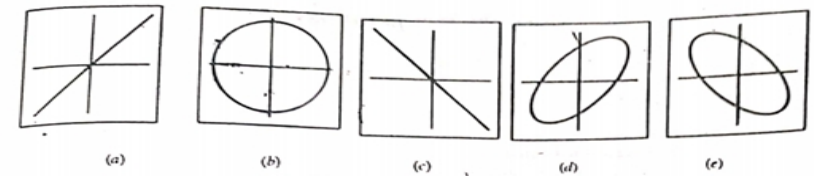
UNIT-IV

7.	a)	Explain the working of Wheatstone bridge used for measurement of medium resistances also derive conditions for balance, with its limitations.	6 Marks	L3	CO4	PO1
	b)	A kelvin bridge is balanced with the following constants: Outer ratio arms : 100Ω and 1000Ω Inner ratio arms : 99.92Ω and 1000.6Ω Resistance of link is 0.1Ω and standard resistance is 0.00377Ω Calculate the value of unknown resistance.	6 Marks	L3	CO4	PO2

(OR)

8.	a)	An Owen's bridge is used to measure the properties of a sample of sheet steel at 2 kHz. At balance, arm AB is test specimen; arm BC is R3=100Ω; arm CD is C4 = 0.1μF and arm DA is R2 = 834Ω in series with capacitance of 0.124 μF. Determine the effective impedance of the specimen under test conditions.	6 Marks	L3	CO4	PO2
	b)	List the various AC bridges used for the measurement of unknown inductance and capacitance of industrial specimens and select the suitable bridge which is used for the determination of relative permittivity of a given specimen of insulating material and describe it.	6 Marks	L3	CO4	PO6

UNIT-V

9.	a)	A sinusoidal input is applied to the vertical input of an oscilloscope starting at t=0. The following Lissajous patterns are obtained when a sinusoidal input is applied to the horizontal terminals. Find the phase shift between vertical and horizontal inputs.  (a) (b) (c) (d) (e)	6 Marks	L2	CO5	PO2
	b)	Describe in detail the working of digital tachometer with neat block diagram and describe how it is superior compared to analog type in laboratory and industrial applications.	6 Marks	L3	CO5	PO5

(OR)

10.	a)	Write short notes on the crucial developments in the design of digital measuring instruments meet the requirements of industry and society.	6 Marks	L2	CO5	PO6
	b)	Describe in detail about digital storage oscilloscope and also list its applications.	6 Marks	L2	CO5	PO1

❀ ❀ ❀

CODE No.: 19BT40204 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC19) Supplementary Examinations January – 2022

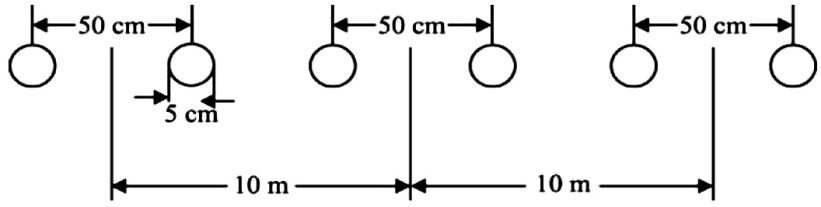
TRANSMISSION AND DISTRIBUTION
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Derive the expression for flux linkages due to internal flux and external flux.	6 Marks	L2	CO1	PO1
	b)	The conductor configuration shown in figure consists of a transposed three-phase transmission line employing two bundle conductors per phase. The diameter of each conductor is 5 cm and the spacing between them is 50 cm, in each bundle. Calculate the inductance and reactance per phase of the line which is 200 km long.	6 Marks	L3	CO1	PO2



(OR)

2.	a)	List out the various properties of dielectric compounds to be used for insulation of cables and explain the capacitance grading of cables.	6 Marks	L1	CO1	PO1
	b)	A single-core cable working on 66 kV on 3-phase system has a conductor diameter of 2 Cm and a sheath of inside diameter 5.3 Cm. If two intersheaths are used, find the best positions, maximum stress and the voltage on the intersheaths.	6 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Discuss the classification of overhead transmission lines based on the length of overhead transmission lines. Define A, B, C and D constants of a transmission line.	6 Marks	L2	CO2	PO1
	b)	A 1−ϕ, overhead transmission line delivers 1100 kW at 33 kV at 0.8 pf lagging. The total resistance and inductive reactance of the line are 10 Ω and 15 Ω respectively. Determine: i) Sending end voltage. ii) Sending end power. iii) Transmission efficiency.	6 Marks	L3	CO2	PO2

(OR)

4.	a)	Explain why a short length of cable is connected between the dead end tower and the terminal apparatus in a station.	6 Marks	L2	CO2	PO1
	b)	An overhead line with surge impedance 400 Ω bifurcates into two lines of surge impedance 400 Ω and 40 Ω respectively. If a surge of 20 kV is incident on the overhead line, determine the magnitudes of voltage and current which enter the bifurcated lines.	6 Marks	L3	CO2	PO2

UNIT-III

5.	a)	Define string efficiency and enumerate various methods to improve string efficiency.	6 Marks	L2	CO3	PO7
	b)	Determine the voltage across each disc of suspension insulators as a percentage of the line voltage to earth. The self and capacitance to ground of each disc is C and $0.2C$ respectively. The capacitance between the link pin and the guard ring is $0.1C$. If the capacitance to the line of the lower link pin were increased to $0.3C$ by means of a guard ring, determine the redistribution of voltage. Also, determine the string efficiency in each case.	6 Marks	L4	CO3	PO4
		(OR)				
6.	a)	An overhead line has a span of 260 m, the weight of the line conductor is 0·68 kg per metre run. Calculate the maximum sag in the line to sustain on the transmission lines to sustain the maximum 1550 kg tension in the line.	6 Marks	L3	CO3	PO7
	b)	A 3-phase line has conductors 2 cm in diameter spaced equilaterally 1 m apart. If the dielectric strength of air is 30 kV (max) per cm, find the disruptive critical voltage for the line. Take air density factor = 0·952 and irregularity factor m_0 = 0·9.	6 Marks	L2	CO3	PO2

UNIT-IV

7.	a)	Discuss briefly the design considerations in distribution system.	6 Marks	L2	CO4	PO1
	b)	A two-wire DC distributor cable 1000 metres long is loaded with 0·5 A/metre. Resistance of each conductor is 0·05 Ω/km. Calculate the maximum voltage drop if the distributor is fed from both ends with equal voltages of 220 V. What is the minimum voltage and where it occurs?	6 Marks	L3	CO4	PO2
		(OR)				
8.	a)	What are the advantages of a doubly fed distributor over singly fed distributor?	6 Marks	L2	CO4	PO1
	b)	A single phase a.c. distributor AB 300 metres long is fed from end A and is loaded as under: i) 100 A at 0·707 p.f. lagging 200 m from point A ii) 200 A at 0·8 p.f. lagging 300 m from point A The load resistance and reactance of the distributor is 0·2 Ω and 0·1 Ω per km. Calculate the total voltage drop in the distributor. The load power factors refer to the voltage at the far end.	6 Marks	L3	CO4	PO2

UNIT-V

9.	a)	How do you analyze a substation service area with 'n' primary feeders?	6 Marks	L3	CO5	PO4
	b)	Explain the procedure to select the location of substation.	6 Marks	L2	CO5	PO1
		(OR)				
10.	a)	Explain the factors affecting the loading of a primary feeder.	6 Marks	L2	CO5	PO1
	b)	Discuss in detail the present design practice of secondary distribution system.	6 Marks	L2	CO5	PO3

❀ ❀ ❀

CODE No.: 19BT40301 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations January – 2022

DYNAMICS OF MACHINERY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		In a four-link mechanism shown in Fig.1, torque T_3 and T_4 have magnitudes of 30N.m and 20 N.m respectively. The link lengths are AD = 800 mm, AB = 300 mm, BC = 700 mm and CD = 400 mm. For the static equilibrium of the mechanism, determine the required input torque T_2	12 Marks	L3	CO1	PO1 PO2 PO3

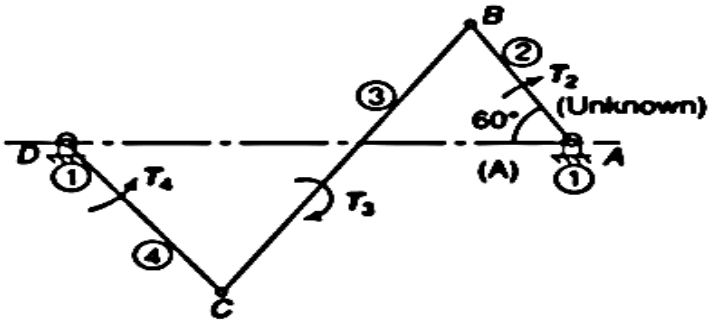


Fig. 1.

(OR)

2.	a)	List various types of brakes and what is the self locking of brake.	4 Marks	L1	CO1	PO1
	b)	A band and block brake, having 14 blocks each of which subtends an angle of 15° at the centre, is applied to a drum of 1 m effective diameter. The drum and flywheel mounted on the same shaft has a mass of 2000 kg and a combined radius of gyration of 500 mm. The two ends of the band are attached to pins on opposite sides of the brake lever at distances of 30 mm and 120 mm from the fulcrum. If a force of 200 N is applied at a distance of 750 mm from the fulcrum, find: i) maximum braking torque, ii) angular retardation of the drum, and iii) time taken by the system to come to rest from the rated speed of 360 r.p.m. The coefficient of friction between blocks and drum may be taken as 0.25.	8 Marks	L2	CO1	PO1 PO2

UNIT-II

3.		The turbine rotor of a ship has a mass of 3500 kg. It has a radius of gyration of 0.45 m and a speed of 3000 r.p.m. clockwise when looking from stern. Determine the gyroscopic couple and its effect upon the ship: i) when the ship is steering to the left on a curve of 100 m radius at a speed of 36 km/h. ii) when the ship is pitching in a simple harmonic motion, the bow falling with its maximum velocity. The period of pitching is 40 seconds and the total angular displacement between the two extreme positions of pitching is 12º.	12 Marks	L3	CO2	PO1 PO2 PO3 PO4

(OR)

4.	a)	What is the function of a flywheel? How does it differ from that of a governor?	4 Marks	L1	CO3	PO1 PO2
	b)	A punching press is required to punch 40 mm diameter holes in a plate of 15 mm thickness at the rate of 30 holes per minute. It requires 6 N-m of energy per mm^2 of sheared area. If the punching takes $1/10^{th}$ of a second and the r.p.m. of the flywheel varies from 160 to 140, determine the mass of the flywheel having radius of gyration of 1 metre.	8 Marks	L3	CO3	PO1 PO2 PO3

UNIT-III

5.		Explain the term height of the governor. Derive an expression for the height in the case of a Watt governor. What are the limitations of a Watt governor?	12 Marks	L3	CO4	PO1 PO2 PO3 PO4

(OR)

6.		In a spring loaded governor of the Hartnell type, the mass of each ball is 1kg, length of vertical arm of the bell crank lever is 100 mm and that of the horizontal arm is 50 mm. The distance of fulcrum of each bell crank lever is 80 mm from the axis of rotation of the governor. The extreme radii of rotation of the balls are 75 mm and 112.5 mm. The maximum equilibrium speed is 5% greater than the minimum equilibrium speed which is 360 r.p.m. Find, neglecting obliquity of arms, initial compression of the spring and equilibrium speed corresponding to the radius of rotation of 100 mm.	12 Marks	L2	CO4	PO1 PO2 PO3 PO4

UNIT-IV

7.	a)	Discuss how a single revolving mass is balanced by two masses revolving in different planes.	4 Marks	L1	CO5	PO1
	b)	A shaft carries four masses A, B, C and D of magnitude 200 kg, 300 kg, 400 kg and 200 kg respectively and revolving at radii 80 mm, 70 mm, 60 mm and 80 mm in planes measured from A at 300 mm, 400 mm and 700 mm. The angles between the cranks measured anticlockwise are A to B 45°, B to C 70° and C to D 120°. The balancing masses are to be placed in planes X and Y. The distance between the planes A and X is 100 mm, between X and Y is 400 mm and between Y and D is 200 mm. If the balancing masses revolve at a radius of 100 mm, find their magnitudes and angular positions.	8 Marks	L3	CO5	PO1 PO2 PO3 PO6

(OR)

8.	a)	Explain the terms Variation of Tractive Force, Swaying Couple, Hammer Blow.	4 Marks	L2	CO5	PO1 PO2
	b)	A twin cylinder V-engine has the cylinders set at an angle of 45°, with both pistons connected to the single crank. The crank radius is 62.5 mm and the connecting rods are 275 mm long. The reciprocating mass per line is 1.5 kg and the total rotating mass is equivalent to 2 kg at the crank radius. A balance mass fitted opposite to the crank, is equivalent to 2.25 kg at a radius of 87.5 mm. Determine for an engine speed of 1800 r.p.m. ; the maximum and minimum values of the primary and secondary forces due to the inertia of reciprocating and rotating masses.	8 Marks	L3	CO5	PO1 PO2 PO3 PO6

UNIT-V

9.	a)	Explain the terms 'under damping, critical damping' and 'over damping'	4 Marks	L2	CO6	PO1
	b)	The measurements on a mechanical vibrating system show that it has a mass of 8 kg and that the springs can be combined to give an equivalent spring of stiffness 5.4 N/mm. If the vibrating system have a dashpot attached which exerts a force of 40 N when the mass has a velocity of 1 m/s, find : i) critical damping coefficient, ii) damping factor, iii) logarithmic decrement, and iv) ratio of two consecutive amplitudes.	8 Marks	L2	CO6	PO1 PO2 PO3 PO5 PO6
		(OR)				
10.	a)	Explain about Magnification Factor or Dynamic Magnifier.	4 Marks	L2	CO6	PO1 PO2
	b)	A mass of 10 kg is suspended from one end of a helical spring, the other end being fixed. The stiffness of the spring is 10 N/mm. The viscous damping causes the amplitude to decrease to one-tenth of the initial value in four complete oscillations. If a periodic force of 150 cos 50 t N is applied at the mass in the vertical direction, find the amplitude of the forced vibrations. What is its value of resonance?	8 Marks	L2	CO6	PO1 PO2 PO3 PO5 PO6

CODE No.: 19BT40302 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations January – 2022

ENGINEERING METROLOGY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What do you mean by unilateral and bilateral tolerances? Explain with neat diagrams.	6 Marks	L 2	CO1	PO1 PO2
	b)	Distinguish between Hole basis system and Shaft basis system.	6 Marks	L 2	CO1	PO1 PO2
		(OR)				
2.		A hole and mating shaft are to have a nominal assembly size of 55 mm. The assembly is to have a maximum clearance of 0.34 mm and a minimum clearance of 0.25 mm. The Hole tolerance is 1.5 times the shaft tolerance. Determine the limits for both hole and shaft by using Hole basis system.	12 Marks	L 3	CO1	PO1 PO2 PO3

UNIT-II

3.	a)	Explain the working principle of Sine Bar with neat sketch. Also discuss its advantages and limitation.	6 Marks	L 2	CO2	PO1 PO2
	b)	What is the working principle of LVDT?	6 Marks	L 1	CO2	PO1 PO2
		(OR)				
4.		Describe about mechanical comparator. Write the advantages and disadvantages of the mechanical comparator.	12 Marks	L 2	CO2	PO1

UNIT-III

5.		In the measurement of surface roughness, heights of 20 successive peaks and valleys from the datum were measured to be 35, 25, 40, 22, 35, 18, 42, 25, 35, 22, 36, 18, 42, 22, 32, 21, 37, 18, 35, 20 microns. Determine the CLA and RMS values of surface roughness over a sampling length of 20 mm.	12 Marks	L 3	CO3	PO1 PO2 PO3
		(OR)				
6.	a)	Name the various numerical methods of assessment of surface finish. Explain them in detail with an example.	6 Marks	L 2	CO3	PO1
	b)	Describe the working principle of an auto collimator.	6 Marks	L 2	CO3	PO1

UNIT-IV

7.	a)	Explain how effective diameter of screw thread is measured using three wire method. Include the sketches.	6 Marks	L 3	CO4	PO1 PO2 PO3
	b)	What is the "best size" wire? Derive an expression for the same in terms of the pitch and angle of the thread.	6 Marks	L 3	CO4	PO1 PO2 PO3
		(OR)				
8.		What are the different methods of measuring gear tooth thickness? Explain the chordal thickness method. Sketch and describe how chordal thickness is measured using gear tooth vernier.	12 Marks	L 2	CO4	PO1 PO2

UNIT-V

9.	a)	Explain working principle of electrical strain gauge with neat sketch.	6 Marks	L2	CO5	PO1 PO2
	b)	Define Strain Rosette. How it is used for strain measurement?	6 Marks	L 2	CO5	PO1 PO2
		(OR)				
10.	a)	Explain working principle of thermocouples.	6 Marks	L 2	CO5	PO1
	b)	Explain basic methods of pressure Measurement.	6 Marks	L 2	CO5	PO1 PO2

CODE No.: 19BT40303 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC19) Supplementary Examinations January - 2022

FLUID MECHANICS AND HYDRAULIC MACHINERY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Differentiate between: i) absolute and gauge pressure. ii) simple and differential manometers. iii) piezometer and pressure gauges.	12 Marks	L2	CO1	PO1
		(OR)				
2.		At the right limb of a simple differential manometer containing the mercury is open to the atmosphere while the left limb is connected to a pipe in which a fluid of specific gravity 0.9 is flowing. The centre of the pipe is 12cm below the level of mercury in the right limb. Find the pressure of fluid in the pipe if the difference of mercury level in the two limbs is 20 cm.	12 Marks	L3	CO1	PO1 PO2

UNIT-II

3.		A pitot-static tube placed in the centre of a 300 mm pipe line has one orifice pointing upstream and other perpendicular it. The mean velocity in the pipe is 0.8 of the central velocity. Find the discharge through the pipe if the pressure difference between two orifices is 60 mm of water. Take the co-efficient of pitot tube as 0.98.	12 Marks	L3	CO2	PO1 PO2
		(OR)				
4.	a)	Compare the following fluid flows: i) Steady and un-steady flow. ii) Uniform and non-uniform flow. iii) Compressible and incompressible flow. iv) Rotational and irrotational flow Laminar and turbulent flow.	6 Marks	L2	CO2	PO1
	b)	A 30 cm diameter pipe, conveying water, branches into two pipes of diameters 20cm and 15cm respectively. If the average velocity in the pipe 30cm diameter is 2.5m/sec, find the discharge in these pipe. Also determine the velocity in 15cm pipe, if the average velocity in 20cm diameter pipe is 2m/sec.	6 Marks	L3	CO2	PO1 PO2

UNIT-III

5.	a)	Explain the characteristics of laminar transition and turbulent boundary layers.	6 Marks	L2	CO3	PO1
	b)	Define the following terms: i) Laminar boundary layer. ii) Turbulent boundary layer. iii) Laminar sublayer. iv) Boundary layer thickness.	6 Marks	L1	CO3	PO1
		(OR)				

6.	a)	Draw a neat sketch of the Reynolds experiment and explain how the laminar flow can be demonstrated.	6 Marks	L2	CO3	PO1
	b)	The rate of flow of water through a horizontal pipe is 0.25 m^3/sec. The diameter of the pipe which is 20 cm is suddenly enlarged to 40 cm. The pressure intensity in the smaller pipe is 11.772 N/cm^2. Determine: i) Loss of head due to sudden enlargement. ii) Pressure intensity in larger pipe. iii) Power loss due to enlargement.	6 Marks	L3	CO3	PO1 PO2 PO3
		UNIT-IV				
7.		Derive an expression for the force exerted by a jet of water on a moving flat plate in the direction of flow.	12 Marks	L3	CO4	PO1 PO2
		(OR)				
8.		A pelton wheel develops 8000 kW under a net head of 130 m at a speed of 200 r.p.m. Assuming the co-efficient of velocity for the nozzle 0.98, hydraulic efficiency 87%, speed ratio 0.46 and jet diameter to wheel diameter ratio 1/9, determine: i) the discharge required, ii) the diameter of the wheel, iii) the diameter and number of jets required, and iv) the specific speed. Mechanical efficiency is 75%.	12 Marks	L3	CO4	PO1 PO2 PO3
		UNIT-V				
9.	a)	Define cavitation, what are the effects of cavitation. Give the necessary precautions against cavitation.	6 Marks	L2	CO5	PO1
	b)	Distinguish pumps in series and parallel.	6 Marks	L2	CO5	PO1
		(OR)				
10.		Explain construction and working principle of a double acting reciprocating pump with a neat diagram.	12 Marks	L2	CO5	PO1

CODE No.: 19BT40304 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, January - 2022

METAL CUTTING AND MACHINE TOOLS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss the principle and requirement of machining	6 Marks	L2	CO1	PO1
	b)	Explain the concept of Generatrix and Directrix	6 Marks	L2	CO1	PO1 PO2
		(OR)				
2.		Analyze the nomenclature and geometry of single point cutting tool.	12 Marks	L2	CO1	PO1 PO2

UNIT-II

3.	a)	Write short notes on chip formation in ductile and brittle materials.	6 Marks	L1	CO2	PO1 PO7
	b)	Define chips and recall the types of chips.	6 Marks	L1	CO2	PO1 PO7
		(OR)				
4.		Derive the expression for the various cutting forces using Merchant's circle diagram.	12 Marks	L3	CO2	PO1 PO2 PO3 PO7

UNIT-III

5.	a)	Differentiate work and tool holding devices.	6 Marks	L2	CO3	PO1 PO2 PO3
	b)	Write short notes on specifications and types of lathes.	6 Marks	L1	CO3	PO1 PO2
		(OR)				
6.		Draw and explain the various operations performed on Lathe with neat diagrams.	12 Marks	L2	CO3	PO1 PO2 PO7

UNIT-IV

7.	a)	Compare slotting and planning machines	6 Marks	L2	CO4	PO1 PO2 PO3 PO7
	b)	List the specifications and different operations done in drilling machine.	6 Marks	L1	CO4	PO1 PO7
		(OR)				
8.		What is boring? Explain the working principle of jig boring machine with neat diagram.	12 Marks	L2	CO4	PO1 PO2 PO7

UNIT-V

9.	a)	Write a brief note on cylindrical grinding machine and surface grinding machine.	6 Marks	L1	CO5	PO1 PO2 PO7
	b)	Discuss on the specification and selection of grinding wheel.	6 Marks	L1	CO5	PO1 PO2 PO3
		(OR)				
10.		Define milling and explain the principle of operation, classification and specifications of milling machine.	12 Marks	L2	CO6	PO1 PO7

CODE No.: 19BT40305 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC19) Supplementary Examinations January – 2022

THERMAL ENGINEERING-I

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What are the differences between Two stroke engine and Four stroke Engine?	6 Marks	L3	CO1	PO1
	b)	Explain the working principle of four stroke CI engine and draw its valve timing diagram.	6 Marks	L2	CO1	PO1 PO2
		(OR)				
2.	a)	Explain the phenomenon of knocking in CI. engine and SI engine	6 Marks	L2	CO1	PO1 PO2
	b)	Define combustion and discuss the factors affecting delay period in C.I engine.	6 Marks	L2	CO1	PO1 PO2

UNIT-II

3.	a)	A gasoline engine working on four- stroke develops a brake power of 20.9 kW. A Morse test was conducted on this engine and the brake power (kW) obtained when each cylinder was made in operative by short circuiting the spark plug are 14.9, 14.3, 14.8 and 14.5 respectively. The test was conducted at constant speed. Find the indicated power, mechanical efficiency and brake mean effective pressure when all the cylinders are firing. The bore of the engine is 75mm and the stroke is 90 mm. The engine is running at 3000 r.p.m.	7 Marks	L3	CO1	PO1 PO2 PO3
	b)	Explain the brake power measurement of IC engine by using rope brake dynamometer.	5 Marks	L2	CO1	PO1 PO2
		(OR)				
4.	a)	List out the methods available for finding frictional power of an engine and explain Williams' line method.	5 Marks	L3	CO1	PO1 PO2
	b)	A two cylinder four stroke engine runs at 240 r.p.m developing a torque of 5 KN-m. The bore and stroke of cylinder are 30 cm and 60 cm respectively. Engine runs with gaseous fuel having calorific value of 16.8 MJ/m^3. The gas and air mixture is supplied in proportion of 1:7 by volume. The volumetric efficiency is 0.85. Determine: i) The brake power. ii) The mean piston speed in m/s. iii) The brake mean effective pressure. iv) The brake thermal efficiency.	7 Marks	L3	CO1	PO1 PO2 PO3

UNIT-III

5.	a)	Compare the relative advantages and disadvantages of gas turbines and IC engines.	5 Marks	L4	CO2	PO1 PO2
	b)	Find the required air-fuel ratio in a gas turbine whose turbine and compressor efficiencies are 85% and 80%, respectively. Maximum cycle temperature is 875°C. The working fluid can be taken as air (C_p = 1.0 kJ/kg K, γ = 1.4) which enters the compressor at 1 bar and 27°C. The pressure ratio is 4. The fuel used has calorific value of 42000 kJ/kg. There is a loss of 10% of calorific value in the combustion chamber.	7 Marks	L3	CO2	PO1 PO2 PO3

(OR)

6.	a)	Discuss the principle of operation of Pulse Jet engine with a neat sketch.	6 Marks	L2	CO2	PO1 PO2
	b)	Discuss the working of turbo prop engine with a neat sketch.	6 Marks	L2	CO2	PO1

UNIT-IV

7.	a)	What is the function of a compressor and explain Rotary type air compressors?	5 Marks	L2	CO3	PO1
	b)	A single stage single acting air compressor delivers 14 m^3 of free air from 1 bar to 7 bar. The speed of the compressor is 300 r.p.m. Assuming the compression and expansion is $pV^{1.35}$ = constant and clearance is 5% of the swept volume, find the diameter and stroke of the compressor. Take stroke length is 1.5 times the bore diameter.	7 Marks	L3	CO3	PO1 PO2 PO3

(OR)

8.	a)	Derive an expression for minimum work required for two stage reciprocating air compressor with perfect inter-cooling and neglect clearance volume.	6 Marks	L3	CO3	PO1 PO2
	b)	Describe the working principle of two stage reciprocating air compressor with a neat sketch.	6 Marks	L2	CO3	PO1

UNIT-V

9.	a)	Explain the modified Rankine cycle with P-V and T-S diagrams.	5 Marks	L2	CO4	PO1 PO2
	b)	A basic steam power plant works on ideal Rankine cycle between 35 bar and 0.04 bar. The initial condition of steam being 0.85 dry and flow rate 15 kg/s determine: i) Work required for pumping. ii) Work done by the turbine and. iii) Cycle efficiency.	7 Marks	L3	CO4	PO1 PO2 PO3

(OR)

10.	a)	Discuss about the concept of cogeneration.	5 Marks	L2	CO4	PO1
	b)	A simple Rankine cycle works between pressure 30 bar and 0.45 bar, the initial conditions of steam being dry saturated. Calculate the cycle efficiency, work ratio and specific steam consumption rate.	7 Marks	L3	CO4	PO1 PO2 PO3

CODE No.: 19BT40307 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC19) Supplementary Examinations January – 2022

MANAGEMENT SCIENCE

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		Explain the importance of managerial functions in detail with a suitable example	12 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Compare and contrast between conceptual and technical skills of a manager.	6 Marks	L2	CO1	PO1 PO2
	b)	Differentiate between Process and customer orientation.	6 Marks	L2	CO1	PO1 PO2
		UNIT-II				
3.		Give an illustrative explanation of different training and development methods adopted in human resource management.	12 Marks	L2	CO2	PO1 PO2
		(OR)				
4.		Compare and contrast between job analysis and job evaluation.	12 Marks	L2	CO2	PO1 PO2
		UNIT-III				
5.		What is the concept of SCM? Explain the basic framework of SCM.	12 Marks	L2	CO3	PO1
		(OR)				
6.		Define Statistics process control. What are the principles and methods of measurement of SPC?	12 Marks	L2	CO3	PO1 PO2
		UNIT-IV				
7.		Explain in detail, the concept of marketing strategy formulation and different components of a marketing plan.	12 Marks	L2	CO4	PO1 PO2
		(OR)				
8.		Explain the concept of designing and managing of marketing channels. Throw some light on Integrated marketing communications.	12 Marks	L2	CO4	PO1 PO2

UNIT-V

9. Civil engineering firm has to bid for the construction of a building. The activities and time estimates are: — 12 Marks — L4 — CO5 — PO1 PO2 PO3 PO4 PO11

Activity	Duration (in days)		
	Optimistic	Most likely	Pessimistic
1-2	14	17	25
2-3	14	18	21
2-4	13	15	18
2-8	16	19	28
3-4	0	0	0
3-5	15	18	27
4-6	13	17	21
5-7	0	0	0
5-9	14	18	20
6-7,6-8	0	0	0
7-9	16	20	41
8-9	14	16	22

The policy of the firm with respect to submitting bids is to bid the minimum amount that will provide a 95% probability of at best breaking even. The fixed cost for the project is Rs. 800000 and the variable cost is Rs. 9000 everyday spent working on the project. What amount should the firm bid under this policy? (You may perform the calculations on duration etc. up to two decimal places).

(OR)

10. A company is designing a new product for welding 2 different alloys. The company has limited time and resources to complete the project. — 12 Marks — L4 — CO5 — PO1 PO2 P03 PO4 PO11

Activity	Immediate predecessor	Time (days)		Cost (Rs)	
		Normal	Crash	Normal	Crash
A	-	4	3	400	125
B	A	5	4	800	200
C	A	4	2	520	150
D	B	3	2	600	225
E	C	3	2	255	100
F	B,E	4	2	600	175

i) Draw the project network.
ii) Find the critical path.
iii) Find the project completion time and the corresponding cost.
iv) What is the total cost, if the project deadline is 13 days?
v) Assume the project deadline to be 10 days. The company has to bear Rs.170 for each day of delay. Find the optimal number of days to crash the project.

CODE No.: 19BT40401 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations January – 2022

ANALOG COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Derive the time domain expression of VSB modulated wave s(t) containing a vestige of upper side band.	6 Marks	L2	CO1	PO2
	b)	Find the percentage of power saved in SSB when compared with AM system.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Explain briefly the need for modulation. Define standard form of amplitude modulation and explain the time and frequency domain expression of AM wave2.	6 Marks	L2	CO1	PO1
	b)	Briefly explain the Quadrature Null Effect in DSB-SC coherent detection. Suggest an appropriate method to offset this problem.	6 Marks	L3	CO1	PO2

UNIT-II

3.	a)	What is Carson's rule? Show that it applies both to narrow band and wide band FM.	6 Marks	L1	CO1	PO2
	b)	Calculate for An angle-modulated signal has the form $u(t)=100\cos[2\pi f_c t+4\sin 2\pi f_m t]$ where f_c=10MHz and f_m=1000Hz. i) Assuming that this is an FM signal, determine the modulation index and the transmitted signal bandwidth. ii) Assuming that this is an PM signal, determine the modulation index and the transmitted signal bandwidth.	6 Marks	L2	CO1	PO4
		(OR)				
4.	a)	Explain the principle of Armstrong method to generate FM modulated wave.	6 Marks	L4	CO1	PO2
	b)	Design Armstrong FM generator for the generation of WBFM signal with Δf = 75 kHz and f_c = 100 MHz, using the narrow band carrier as 100 kHz and second carrier as 9.5 MHz. Find the suitable multiplying factors. Assume the message signal is defined in the range, 100Hz-15KHz.	6 Marks	L2	CO1	PO4

UNIT-III

5.	a)	How is FM superior to AM with reference to noise?	6 Marks	L4	CO2	PO2
	b)	An amplifier with 10dB nose figure and 4dB power gain is cascaded. With a second amplifier has a 10dB power gain and 10dB noise figure. What is the overall noise figure and power gain?	6 Marks	L4	CO2	PO2
		(OR)				
6.	a)	Derive the expression for SNR and figure of merit of coherent reception of DSB modulated wave.	6 Marks	L4	CO2	PO2
	b)	If each stage has a gain of 10dB and noise figure of 10dB, determine the overall noise figure of a two stage cascaded amplifier.	6 Marks	L4	CO2	PO2

UNIT-IV

7.	a)	Explain the limitations of TRF receivers.	6 Marks	L1	CO3	PO1
	b)	What can be done to improve the overall limiting performance of an FM receiver? Explain the operation of the double limiter and also AGC in addition to a limiter.	6 Marks	L1	CO3	PO3
		(OR)				
8.	a)	What do you mean by Automatic Gain Control (AGC)? What are merits of delayed AGC over simple AGC?	6 Marks	L4	CO3	PO2
	b)	The antenna current of transmitter is 11.5 Amp when it is modulated to a depth 45% by audio sine wave. Determine unmodulated (carrier) current.	6 Marks	L1	CO3	PO1

UNIT-V

9.	a)	Discuss about the spectra of PWM and PDM signals.	6 Marks	L1	CO4	PO1
	b)	For a pulse amplitude modulated transmission of voice signal having maximum frequency equal to f_m=3kHz, calculate the transmission bandwidth. It is given that the sampling frequency f_s=8 kHz and the pulse duration t=0.1T_s	6 Marks	L3	CO4	PO2
		(OR)				
10.	a)	Explain the concept of multiplexing in communication.	6 Marks	L1	CO4	PO1
	b)	Differentiate between FDM and TDM. Explain which of the two is superior and why.	6 Marks	L2	CO4	PO1

CODE No.: 19BT40402 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC19) Supplementary Examinations January - 2022

ELECTRONIC CIRCUIT ANALYSIS AND DESIGN

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Develop expressions for Current gain, Voltage gain, input Resistance and Output Resistance of Darlington amplifier.	8 Marks	L4	CO1	PO3
	b)	Illustrate the working of a CASCODE amplifier with the help of a neat diagram.	4 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Construct the bandwidth of a multistage amplifier, assuming that each stage has same upper and lower cut off frequencies.	6 Marks	L4	CO1	PO6
	b)	Design Two stage RC coupled amplifier to meet the following specifications A_v = 400, S=3, V_{cc}=12V, I_c=1mA, f_L =50Hz and R_s =500Ω. Assume data wherever necessary.	6 Marks	L6	CO1	PO4
		UNIT-II				
3.	a)	Explain the parameters of hybrid – π model with neat equivalent circuits.	6 Marks	L2	CO2	PO1
	b)	A transistor amplifier in CE configuration is operated at High frequency with the following specifications I_c= 5m A, V_{ce}=10V, h_{fe}=100, h_{ie}=600Ω , A_i=10 at 10Mhz C_c=3PF. Discover f_β, f_T , C_e, $r_{b'e}$ and $r_{bb'}$.	6 Marks	L3	CO2	PO2
		(OR)				
4.	a)	Prove that: i) $h_{fe} = g_m * r_{b'e}$ ii) $h_{ie} = r_{bb} + r_{b'e}$	6 Marks	L2	CO2	PO2
	b)	Consider a CE stage with a resistive load RL. Using Miller's theorem, analyze the mid band input capacitance.	6 Marks	L4	CO2	PO2
		UNIT-III				
5.		Construct a current series feedback amplifier using BJT and calculate its voltage gain, input resistance and output resistance	12 Marks	L4	CO3	PO2
		(OR)				
6.	a)	Write a short note on the following: i) Sampler and its types. ii) Mixer and its types.	6 Marks	L2	CO2	PO1
	b)	Prove that the gain with feedback decreases by a factor of (1+A β) with a neat sketch.	6 Marks	L3	CO3	PO2
		UNIT-IV				
7.	a)	Derive the Expressions for frequency of oscillation of crystal oscillator and explain its working.	4 Marks	L3	CO3	PO2
	b)	A crystal has L=0.4H, C=0.085pf, and C_M= 1pf with R=5KΩ, Determine: i) Series resonant frequency. ii) Parallel Resonant Frequency. iii) By what percent does the parallel resonant frequency exceed the series resonant frequency? iv) Q factor of the crystal.	8 Marks	L3	CO3	PO2

(OR)

8.	a)	The frequency sensitive arms of the wein bridge oscillator uses $C_1=C_2=0.001\mu F$ and $R_1=10k\Omega$ while R_2 is kept variable. The frequency is to be varied from 10kHz to 50 kHz by varying R_2. Determine the minimum and maximum valves of R_2.	8 Marks	L3	CO3	PO2
	b)	Write a short note on frequency stability of oscillator.	4 Marks	L2	CO3	PO1

UNIT-V

9.	a)	Explain in detail about the operation of class-C power amplifier.	8 Marks	L2	CO5	PO1
	b)	Write the applications of Tuned amplifiers.	4 Marks	L2	CO5	PO2

(OR)

10.		Explain the working of single tuned amplifier with suitable circuits and derive the expression for A/A_{res}.	12 Marks	L2	CO5	PO1

CODE No.: 19BT40403 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, January - 2022

LINEAR AND DIGITAL IC APPLICATIONS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Design a Monostable multivibrator using 555 timer to produce a pulse width of 100 m sec.	6 Marks	L3	CO1	PO3
	b)	Explain the basic principle of operation of RC Phase shift oscillator using op-amp. Derive the condition for frequency of oscillations.	6 Marks	L1	CO1	PO8
		(OR)				
2.	a)	Sketch the functional block diagram of NE 565 PLL and make circuit connections to track the input signal and explain its working principle.	6 Marks	L1	CO1	PO6
	b)	A PLL has a free running frequency of 500 KHz, the bandwidth of the LPF=10KHz. Will the PLL lock-in if f_i =60 KHz? What is the frequency of the VCO output.	6 Marks	L4	CO1	PO3
		UNIT-II				
3.	a)	Design a second order Butterworth HPF and plot the frequency response?	6 Marks	L3	CO2	PO3
	b)	In a second-order high pass Butterworth filter C2 = C3 =0.047μf, R2 =R3 = 3.3KΩ, R1 = 27 KΩ and RF=15.8 KΩ. Determine the low cutoff frequency fL of the filter	6 Marks	L4	CO2	PO4
		(OR)				
4.	a)	Examine the operation of a successive approximation type Analog to Digital converter.	6 Marks	L1	CO3	PO2
	b)	Compare different A/D converters for their merits and demerits.	6 Marks	L1	CO3	PO1
		UNIT-III				
5.	a)	List the capabilities of Verilog HDL.	6 Marks	L1	CO4	PO1
	b)	Explain Behavioral design elements of Verilog HDL.	6 Marks	L1	CO4	PO1
		(OR)				
6.	a)	List and explain operators used in verilog HDL.	6 Marks	L1	CO4	PO1
	b)	Assess the structural design elements of Verilog HDL with a suitable example.	6 Marks	L2	CO4	PO2
		UNIT-IV				
7.	a)	Sketch the symbol, logic diagram & write Verilog HDL source code of 74x138 IC.	6 Marks	L2	CO5	PO6
	b)	Explain the concept of dual priority encoder and write its Verilog HDL code.	6 Marks	L2	CO5	PO1
		(OR)				
8.	a)	Analyze a Barrel Shifter using 74x151 multiplexer and write its Verilog HDL code.	6 Marks	L2	CO5	PO2
	b)	Explain the concept of 74x280 9-Bit Parity Generator with an example.	6 Marks	L1	CO5	PO1

UNIT-V

9.	a)	Describe about 74LS109 JK flip-flop and write Verilog HDL program with pre-set and clear.	6 Marks	L2	CO5	PO3
	b)	Design an Excess-3 decimal counter using 74x163 ICs.	6 Marks	L3	CO5	PO3
		(OR)				
10.	a)	Design and implement counter using Verilog HDL which counts up to 9 and down counts again from 9 to 0.	6 Marks	L3	CO5	PO3
	b)	Analyze a 4-bit Ring Counter and explain its operation. Write a Verilog HDL code for the above design.	6 Marks	L3	CO5	PO2

CODE No.: 19BT40404 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC19) Supplementary Examinations January – 2022

PROBABILITY AND STOCHASTIC PROCESSES

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Committee of 5 persons is to be selected randomly from a group of 5 men and 10 women. i) Find the probability that the committee consists of 2 men and **3** women. ii) Find the probability that the committee consists of all women.	6 Marks	L2	CO1	PO4
	b)	Discuss about Bernoulli's Trails with relevant examples.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Consider the experiment of tossing a fair coin repeatedly and counting the number of tosses required until the first head appears. i) Find the probability that the first head appears on an even-numbered toss. ii) Find the probability that the first head appears on an odd-numbered toss.	6 Marks	L2	CO1	PO4
	b)	In a box there are 100 resistances having resistance and tolerance as represented in the table shown below. If a resistor is chosen with the same likelihood of being chosen for the three events, A as "draw a 47 Ω resistor", B as "draw a resistor with 5% tolerance", C as "draw a 100 Ω resistor"; i) find P(A/B) and P(C/B) ii) find P(AUB)	6 Marks	L2	CO1	PO4

Resistance(Ω)	Tolerance		
	5%	10%	Total
22	10	14	24
47	28	16	44
100	24	8	32
Total	62	38	100

UNIT-II

3.	a)	Define cumulative probability distribution function and state the properties of the cumulative probability distribution function.	6 Marks	L2	CO2	PO1
	b)	Binary data are transmitted over a noisy communication channel in block of 16 binary digits. The probability that a received digit is in error as a result of channel noise is 0.01. Assume that the errors occurring in various digit positions within a block are independent. i) Find the mean and the variance of the number of errors per block. ii) Find the probability that the number of errors per block is greater than or equal to 4.	6 Marks	L2	CO2	PO4
		(OR)				

4.	a)	State and prove the properties of the probability density function.	6 Marks	L2	CO2	PO1
	b)	Differentiate between moments about the origin and central moments with appropriate mathematical expressions.	6 Marks	L2	CO2	PO1

UNIT-III

5.	a)	The joint PDF of (X, Y) is $f_{xy}(x,y)=4xy$, $0<x,y<1$ and $f_{xy}(x,y)=0$, otherwise. Find E(XY).	6 Marks	L3	CO2	PO2
	b)	Gaussian Random Variables X and Y have first and second order moments $m_{10} = -1.1, m_{20} = 1.16 m_{01} = 1.5, m_{20} = 2.89, R_{xy} = -1.724$ i) Find the C_{xy}, ρ . ii) Write expression for Jointly Gaussian Density function.	6Marks	L3	CO2	PO2

(OR)

6.	a)	Find the density of W=X+Y where the densities of X and Y are assumed to be $f_{(x)}(x) = \frac{1}{a}[U(X) - U(X-a)]$. $f_{(Y)}(y) = \frac{1}{b}[U(Y) - U(Y-b)]$ *where* $0 < a < b$.	6 Marks	L3	CO2	PO2
	b)	Two Gaussian Random Variables X_1 and X_2 have zero means and variances 4 and 9. Their Covariance is equal to 3. If X_1 and X_2 are linearly transformed to new variables Y_1 and Y_2 according to: $Y_1 = X_1 - 2X_2$ $Y_2 = 3X_1 - 4X_2$ Find: i) Mean. ii) Variances. iii) Covariance of Y_1 and Y_2 .	6 Marks	L3	CO2	PO2

UNIT-IV

7.		A random process is defined by x(t) =A where A is a continuous random variable uniformly distributed on (0,1) and t represents time. Find: i) E [x (t)]. ii) Is the process stationary?	12 Marks	L2	CO3	PO2

(OR)

8.	a)	A random process had the power density spectrum $S_{XX}(\omega)=6\omega^2/(1+\omega^2)$. Find the average power in the process.	6 Marks	L2	CO3	PO2
	b)	Let Y(n)=X(n)+W(n), where X(n) = A (for all n) and A is a Random variable with zero mean and variance σ_A^2, and W(n) is a discrete-time white noise with average power σ^2. It is also assumed that X(n) and W(n) are independent. i) Show that Y(n) is WSS. ii) Find the probability density of W (n).	6 Marks	L2	CO3	PO2

UNIT-V

9.	a)	List different types of noise.	6 Marks	L3	CO4	PO1
	b)	An amplifier with gain=30dB and Bandwidth=25kHz is found to have T=120K. Noise Figure =2. Find T_e and output noise power.	6 Marks	L2	CO4	PO4

(OR)

10.	a)	For a non-ideal amplifier having following parameters, Input Signal Power=2×10^{-10}W, Input Noise Power=2×10^{-18}W, Power gain=60dB, Internal Noise =6×10^{-12} W Determine: i) Input S/N Ratio(dB). ii) Output S/N Ratio(dB). iii) Noise Factor.	6 Marks	L2	CO4	PO4
	b)	Derive the expression for thermal noise voltage.	6 Marks	L3	CO4	PO1

CODE No.: 19BT40441 SVEC-19

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations January – 2022

ANALOG ELECTRONICS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Analyze a Darlington amplifier to increase input impedance using Bootstrapping Method.	6 Marks	L2	CO1	PO2
	b)	With the help of circuit diagram explain RC coupling scheme used in multi stage amplifiers.	6 Marks	L2	CO1	PO6
		(OR)				
2.	a)	Analyze the effects of coupling and bypass capacitors on frequency response also plots its frequency response.	8 Marks	L1	CO1	PO1
	b)	Explain the multistage frequency effects.	4 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	Apply voltage series feedback to the Emitter follower to increase input impedance and to decrease output impedance.	6 Marks	L2	CO2	PO2
	b)	Discuss in detail about current series feedback amplifier with CE.	6 Marks	L1	CO2	PO1
		(OR)				
4.	a)	Discuss in detail about the benefits of negative feedback in amplifiers.	6 Marks	L3	CO2	PO2
	b)	Select a Trans-conductance amplifier and prove its input and output impedances are very large compared to CE amplifier.	6 Marks	L2	CO2	PO5
		UNIT-III				
5.	a)	Explain principle and operation of the Wien Bridge Oscillator and derive expression for frequency of oscillation.	8 Marks	L1	CO2	PO1
	b)	What will happen if barkhausen criterion did not fulfilled by an oscillator circuit.	4 Marks	L1	CO2	PO1
		(OR)				
6.	a)	A Crystal oscillator has the following parameters. L = 0.33H, C**1** = 0.065pF, C**h** = 1.0pF and R = 5.5KΩ. Find the series resonant frequency and Q - factor of the crystal.	6 Marks	L3	CO2	PO4
	b)	Select a RC phase shift Oscillator using FET and derive the expression for the frequency of oscillations.	6 Marks	L2	CO2	PO5
		UNIT-IV				
7.	a)	What are the advantages and disadvantages of a transformer coupled Class - A power amplifier.	6 Marks	L1	CO3	PO1
	b)	Discuss in detail about Class AB power amplifier.	6 Marks	L3	CO3	PO5
		(OR)				
8.	a)	Explain crossover distortion in class-B power amplifier.	6 Marks	L2	CO3	PO2
	b)	In class A power amplifier R_l=5Ω, V_{cEsat}=1v, V_{CEmax}=40v, $P_{c(max)}$=20w, transformer coupling n=2. Find the efficiency.	6 Marks	L1	CO3	PO4
		UNIT-V				
9.	a)	Analyze the bandpass filter and derive an equation for its gain.	6 Marks	L1	CO4	PO2
	b)	For the all pass filter the values of R and C are 7.95KΩ and 0.02μF respectively. If the input frequency is 1.5KHz, calculate the phase shift.	6 Marks	L2	CO4	PO3

(OR)

10.	a)	Design astable multivibrator using 555 timer and explain the operation with relevant waveforms.	6 Marks	L4	CO4	PO3
	b)	Design one shot multivibrator with a pulse width of 100ms using 555 timer.	6 Marks	L4	CO4	PO3

CODE No.: 19BT40501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations January – 2022

COMPUTER NETWORKS

[Computer Science and Engineering, Information Technology]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Identify the key issues for network support layers.	6 Marks	L2	CO1	PO1
	b)	Explain service primitives in connection-oriented service.	6 Marks	L3	CO1	PO1
		(OR)				
2.	a)	What networks are used in the computer labs in your organization? Describe network type topology and switching methods used there.	6 Marks	L3	CO1	PO1
	b)	Elucidate the social issues of networks applications.	6 Marks	L2	CO5	PO8
		UNIT-II				
3.	a)	If the 7-bit Hamming code word received by a receiver is 1011011. Assuming the even parity state whether the received code word is correct or wrong. If wrong locate the bit having error.	6 Marks	L4	CO3	PO4
	b)	Discuss the design issues of data link layer.	6 Marks	L2	CO1	PO1
		(OR)				
4.	a)	Explain the flow control mechanism with an example.	6 Marks	L3	CO3	PO1
	b)	Write short notes about repeaters, routers and gateways.	6 Marks	L2	CO1	PO1
		UNIT-III				
5.	a)	Apply shortest-path-routing algorithm to find a shortest path between source and destination with suitable example.	6 Marks	L4	CO2	PO4
	b)	Compare distance vector and link state routing protocols.	6 Marks	L4	CO2	PO2
		(OR)				
6.	a)	Explain hierarchical routing with an example.	6 Marks	L3	CO2	PO1
	b)	Apply CIDR aggregation on the following IP addresses: 150.97.28.0/24 150.97.29.0/24 150.97.30.0/24	6 Marks	L4	CO2	PO4
		UNIT-IV				
7.	a)	Compare the TCP header and the UDP header. List the fields in the TCP header that are not part of the UDP header. Give the reason for each missing field.	6 Marks	L4	CO3	PO2
	b)	With a neat diagram, explain Remote Procedure Call.	6 Marks	L2	CO3	PO1
		(OR)				
8.	a)	Explain RTP Header format.	6 Marks	L2	CO1	PO1
	b)	The following is a dump of a TCP header in hexadecimal format **$(0532017\ 00000001\ 00000000\ 500207FF\ 00000000)_{16}$** i) What is the source port number? ii) What is the destination port number? iii) What the sequence number? iv) What is the acknowledgement number?	6 Marks	L4	CO3	PO4

UNIT-V

9.	a)	Explain Hyper Text Transfer Protocol request and response messages in detail.	6 Marks	L2	CO4	PO6
	b)	What are the duties of File Transfer Protocol?	6 Marks	L3	CO4	PO6
		(OR)				
10.	a)	Determine which of the following are FQDN and which is are PQDN. i) mil. ii) edu. iii) xxx.yyy.net iv) zzz.yyy.xxx.edu	6 Marks	L3	CO4	PO6
	b)	Explain World Wide Web architecture.	6 Marks	L2	CO1	PO1

CODE No.: 19BT40502 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC19) Supplementary Examinations January – 2022

DATABASE MANAGEMENT SYSTEMS

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss in detail on the role of Database Administrator.	6 Marks	L2	CO1	PO1
	b)	Explain the difference between logical and physical data independence.	6 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Why would you choose a database system instead of simply storing data in operating system files? When would it make sense not to use a database system?	6 Marks	L1	CO1	PO2
	b)	What are the responsibilities of a DBA?	6 Marks	L1	CO1	PO1

UNIT-II

3.		Define the following terms: i) Relation schema ii) Relational database schema iii) Relation cardinality iv) Relation degree.	12 Marks	L1	CO2	PO1
		(OR)				
4.	a)	Discuss in detail about Relational Model. Does the relational model, as seen by an SQL query writer, provide physical and logical data independence? Explain.	6 Marks	L2	CO2	PO2
	b)	Discuss in detail about the Operators in Relational Algebra.	6 Marks	L2	CO2	PO1

UNIT-III

5.		The questions are based on the following relational schema: emp (eid: integer, ename: string, age: integer, salary: real) works (eid: integer, did: integer, pcttime: integer) dept (did: integer, dname: string, budget: real, managerid: integer). Answer the following: i) Write an SQL statement to give every employee a 10 percent raise. ii) Define the Dept relation in SQL so that every department is guaranteed to have a manager. iii) Write an SQL statement to add John Doe as an employee with eid = 101, age = 32 and salary = 15, 000	12 Marks	L1	CO3	PO4

(OR)

6.		The following relations keep track of airline flight information: flights (flno: integer, from: string, to: string, distance: integer, departs: time, arrives: time, price: real) aircraft (aid: integer, aname: string, cruising range: integer) certified (eid: integer, aid: integer) employees (eid: integer, ename: string, salary: integer) Answer the following in form of SQL query: i) Find the names of aircraft such that all pilots certified to operate them have salaries more than $80,000. ii) For each pilot who is certified for more than three aircraft, find the eid and the maximum cruising range of the aircraft for which she or he is certified. iii) Find the names of pilots whose salary is less than the price of the cheapest route from Los Angeles to Honolulu. iv) For all aircraft with cruising range over 1000 miles, find the name of the aircraft and the average salary of all pilots certified for this aircraft.	12 Marks	L1	CO3	PO4
		UNIT-IV				
7.		Define Normalization. Explain the different forms of Normalization in detail with appropriate examples.	12 Marks	L2	CO4	PO1
		(OR)				
8.	a)	What is a transaction? In what ways is it different from an ordinary program?	6 Marks	L2	CO5	PO2
	b)	Explain the terms in detail: i) Recoverability. ii) Serializability.	6 Marks	L1	CO4	PO1
		UNIT-V				
9.	a)	Explain in detail about Lock based protocols.	6 Marks	L1	CO5	PO1
	b)	Discuss in detail about validation-based protocols.	6 Marks	L3	CO5	PO1
		(OR)				
10.		Explain in detail about the following: i) Hash-based Indexing ii) Tree-based Indexing	12 Marks	L2	CO5	PO1

CODE No.: 19BT40503 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, January – 2022

DESIGN AND ANALYSIS OF ALGORTIHMS

[Computer Science and Engineering,
Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

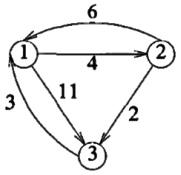
1.	a)	Demonstrate various types on complexities and Asymptotic notations with examples.	6 Marks	L2	CO1	PO1
	b)	Solve the recurrence relation using Recursion tree method and Identify the complexity. $T(n)= T(1)$ if $n = 1$ $aT(n/b) + f(n)$ if $n > 1$, where $a=3$, $b=4$, and $f(n)=cn^2$	6 Marks	L4	CO1	PO2
		(OR)				
2.	a)	Define amortized analysis illustrate aggregate analysis with example.	6 Marks	L3	CO1	PO1
	b)	Apply Master's theorem on the following recurrence relation and find its complexity. $T(n)=8T(n/2) +1000n^2$	6 Marks	L4	CO1	PO2

UNIT-II

3.	a)	Illustrate SimpleUnion() and WeightedUnion() algorithms with an example.	4 Marks	L2	CO2	PO2
	b)	Consider the array of ten elements: a[1:7] = (36, 25, 40, 2, 7, 80, 15). Sort these elements using Merge sort algorithm. Analyze its time and space complexity and represent in the form of recurrence relation.	8 Marks	L4	CO2	PO2
		(OR)				
4.	a)	Analyze and compare the complexities of recursive and iterative versions of binary search algorithm.	6 Marks	L4	CO2	PO2
	b)	Outline an algorithm to find MaxMin on a given set of elements.	6 Marks	L4	CO2	PO1

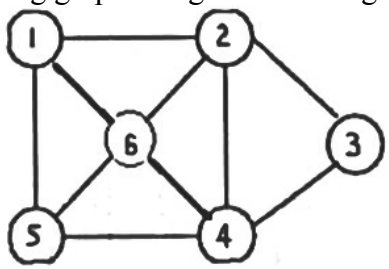
UNIT-III

5.	a)	Differentiate characteristics of greedy method and dynamic programming.	6 Marks	L2	CO2	PO1
	b)	Analyze the working of Matrix Chain Multiplication algorithm and compute its complexity.	6 Marks	L3	CO2	PO2
		(OR)				
6.	a)	Compute the cost of shortest path for the following digraph using All Paths algorithm.	6 Marks	L4	CO2	PO2



	b)	Apply 0/1 knapsack method for the case in which n = 3, W1 =2, W2 =3; W3 = 4, p1 = 1, p2= 2, p3= 5, and m = 6, compute the maximum profit.	6 Marks	L4	CO3	PO3

UNIT-IV

7.	a)	Outline Huffmann coding algorithm and demonstrate with suitable example.	6 Marks	L3	CO2	PO2
	b)	Use algorithm ShortestPaths to obtain in nondecreasing order the lengths of the shortest paths from vertex1 to all remaining vertices by taking suitable digraph.	6 Marks	L3	CO2	PO2
		(OR)				
8.	a)	Demonstrate n-Queens problem by placing n-queens in such a manner on an n x n chessboard that no queens attack each other by being in the same row, column or diagonal, by taking suitable example.	6 Marks	L3	CO2	PO3
	b)	Write about Hamiltonian Cycle. Draw the portion of state space tree for the following graph using backtracking approach? 	6 Marks	L3	CO2	PO2

UNIT-V

9.	a)	Draw the portion of the state space tree generated by LCBB for the following knapsack instances. n = 5, (P1, P2, P3, P4, P5) = (w1, w2, w3, w4, w5) = (4, 4, 5, 8,9) and m = 15.	6 Marks	L3	CO3	PO1
	b)	Present an algorithm schema LCBB for a LC branch and bound search for a least cost answer node.	6 Marks	L2	CO3	PO1
		(OR)				
10.	a)	Explain the classes of NP-hard and NP-complete.	6 Marks	L2	CO4	PO1
	b)	Show that Hamiltonian path problem is NP-complete.	6 Marks	L2	CO4	PO1

CODE No.: 19BT41501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations January – 2022

THEORY OF COMPUTATION

[Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

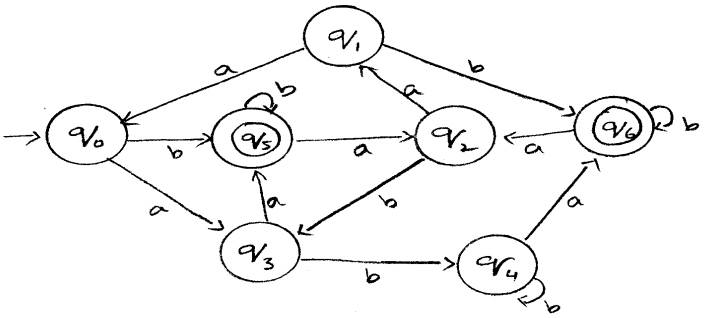
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

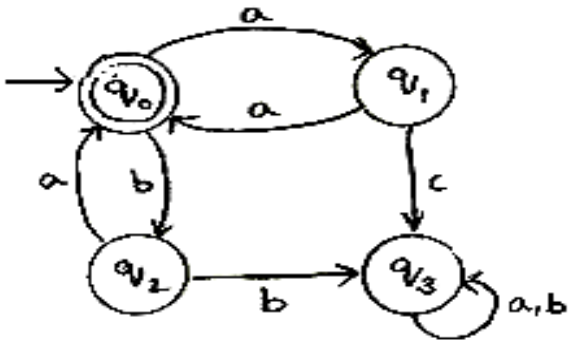
1.	a)	Write short notes on applications of automata theory.	4 Marks	L2	CO1	PO1
	b)	Design a Deterministic Finite Automation accepting the language given over the alphabet {0, 1}. L = {the set of all strings such that every block of five consecutive contain at least two 0's}.	8 Marks	L4	CO1	PO3
		(OR)				
2.	a)	Differentiate NFA and DFA with respect to transition and acceptance.	7 Marks	L2	CO1	PO1
	b)	Draw DFA which accepts even number of a's and even number of b's over the alphabet {a, b}.	5 Marks	L3	CO1	PO3

UNIT-II

3.	a)	Minimize the Finite automation given below and show both the given and the reduced one are equivalent.	7 Marks	L4	CO2	PO5



	b)	Briefly explain Closure properties of regular languages.	5 Marks	L2	CO2	PO2
		(OR)				
4.	a)	Define regular expression and prove every regular expression can be represented by an NFA with epsilon transitions.	6 Marks	L2	CO3	PO1
	b)	Construct the regular expression accepted by following finite automaton:	6 Marks	L4	CO3	PO3



UNIT-III

5.	a)	Obtain CFG for balanced set of parenthesis.	5 Marks	L3	CO4	PO4
	b)	Simplify the grammar G. S→AB A→a B→b B→C E→c|^	7 Marks	L3	CO4	PO4

(OR)

6.		Convert the following grammar to Greibach normal form. S→ABA→BS|b B→SB|a	12 Marks	L3	CO4	PO2

UNIT-IV

7.	a)	Explain Chomsky hierarchy of languages with a neat diagram.	6 Marks	L2	CO2	PO1
	b)	Show that the language $L_1=\{0^n1^m \mid n=m \text{ and } n\geq 1\}$ is deterministic context free language.	6 Marks	L4	CO6	PO2

(OR)

8.	a)	Design a PDA for accepting a language {anb2n | n≥1}.	6Marks	L4	CO6	PO4
	b)	Construct PDA for the given CFG, and test whether 0104 is acceptable by this PDA. S → 0BB B → 0S | 1S | 0	6 Marks	L4	CO6	PO3

UNIT-V

9.	a)	Define Turing machine and explain its model.	7 Marks	L2	CO5	PO1
	b)	Design Turing machine for the language L={w€{a,b,c}*|w contains equal number of a's, b's and c's}.	5 Marks	L4	CO5	PO3

(OR)

10.		Design Turing machine for the following:				
		i) That computes ones complement of a binary number.	6 Marks	L4	CO5	PO3
		ii) That shifts the input string, over the alphabet(0,1) by one position right by inserting '#' as the first character.	6 Marks	L4	CO5	PO3

CODE No.: 19BT41501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations January – 2022

THEORY OF COMPUTATION

[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Convert the following Moore machine into Melay machine. 6 Marks L3 CO1 PO4

Present State	Next State		Output
	a = 0	a = 1	
→ a	d	b	1
B	a	d	0
C	c	c	0
D	b	a	1

b) Write a short notes on central concepts of automata theory. 6 Marks L2 CO1 PO1

(OR)

2. a) Convert the following NFA to a DFA. 7 Marks L3 CO1 PO4

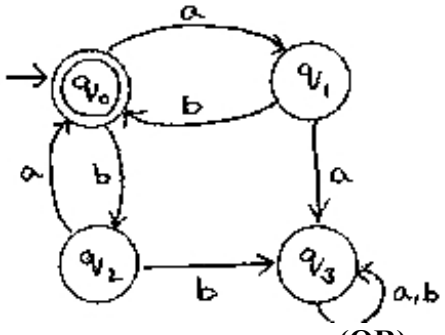
δ	a	b
p	{ p }	{ p,q }
q	{ r }	{ r }
r	{ ϕ }	{ ϕ }

b) Discuss on the relation between DFA and minimal DFA. 5Marks L2 CO1 PO1

UNIT-II

3. a) Construct FA equivalence to the following regular expression r = 01[((10)*+111)*+0]*1. 6 Marks L4 CO2 PO3

b) Construct the regular expression accepted by following finite automaton. 6 Marks L4 CO2 PO3



(OR)

4. a) Construct a DFA for the regular expression 10 + (0+11) 0*1 and optimize the states. 6 Marks L4 CO2 PO4

b) Show that the set $\{a^{i2}\}$ is not regular. 6 Marks L3 CO2 PO5

UNIT-III

5.	a)	Construct equivalent grammar in Chomsky Normal Form for the grammar. G=({S,A,B},{a,b}, {SàaAbB, AàaA|a, BàbB|b } ,S	6 Marks	L4	CO3	PO3
	b)	Construct a CFG for a language L = {wcwR | where w € (a, b)*}.	6 Marks	L4	CO3	PO2
		(OR)				
6.	a)	Given the grammar G as S→0B|1A, A→0|0S|1AA, B→1|1S|0BB Give the leftmost and rightmost derivations and parse tree to derive the string 00110101.	6 Marks	L3	CO3	PO
	b)	Construct a CFG for the language L = anb2n where n≥1.	6 Marks	L2	CO3	PO1

UNIT-IV

7.	a)	Design a PDA to accept the following CFG: S →AA/a A →SA/b.	6 Marks	L4	CO4	PO3
	b)	Explain properties of Context Free Languages.	6 Marks	L2	CO4	PO1
		(OR)				
8.	a)	Explain in detail about the model of Linear Bounded Automata.	6 Marks	L2	CO4	PO1
	b)	Compare and contrast NFA and PDA.	6 Marks	L2	CO4	PO1

UNIT-V

9.	a)	Design a Turing Machine to recognize the language L={ $1^n2^n3^n$| n≥1}.	8 Marks	L4	CO5	PO3
	b)	Briefly explain Universal Turing Machine.	4 Marks	L2	CO5	PO1
		(OR)				
10.	a)	Design a Turing Machine which can multiply two positive integers.	6 Marks	L4	CO5	PO3
	b)	Write short notes on undecidability problem with an example.	6 Marks	L2	CO5	PO2

CODE No.: 19BT50201 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations January – 2022

CONTROL SYSTEMS

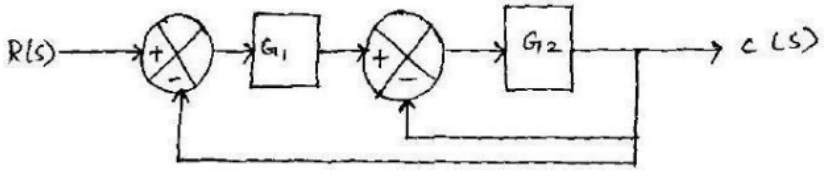
[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

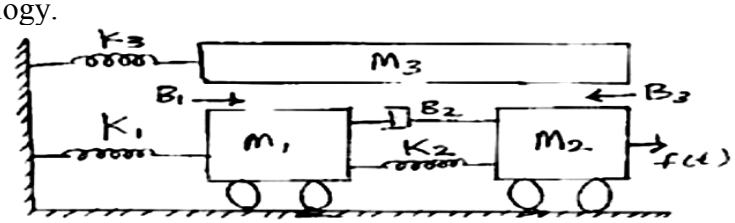
UNIT-I

1.	a)	Derive an expression for the transfer function of a Field controlled DC motor.	6 Marks	L3	CO1	PO1
	b)	Find the transfer function for the given system using block diagram reduction techniques.	6 Marks	L3	CO1	PO5



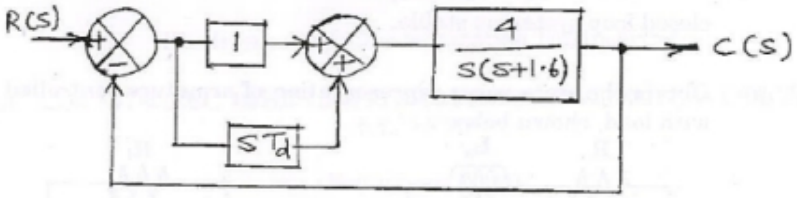
(OR)

2.		For the mechanical system shown in figure, obtain the differential equation governing the system and find force-current analogy.	12 Marks	L3	CO1	PO2



UNIT-II

3.	a)	Derive the expression for the time response of a 2nd order under damped system with unit step as input.	6 Marks	L2	CO2	PO1
	b)	Figure shows PD controller used for controlling an industrial plant. Determine the value of T_d so that system will be critically damped. Calculate the settling time.	6 Marks	L4	CO2	PO2



(OR)

4.	a)	What is a derivative controller and justify how does it improves the dynamics of a control system?	4 Marks	L2	CO2	PO7
	b)	The open-loop transfer function of unity feedback system is $G(S) = \frac{4}{S(S+1)}$. Determine the nature of the closed-loop system for a unit-step input. Also determine rise time, peak time and peak overshoot.	8 Marks	L3	CO2	PO2

UNIT-III

5.	a)	Draw polar plot for the given open loop transfer function $G(S) = \frac{1}{S(1+S)(1+2S)}$ and determine the gain and phase margin.	6 Marks	L3	CO3	PO2
	b)	Analyze the given system $G(S) = \frac{20}{S(1+3S)(1+4S)}$ using Bode plot and obtain its stability margins.	6 Marks	L4	CO3	PO4

(OR)

6.	a)	Investigate the stability for a closed loop control system whose characteristic equation $S^6 + S^5 + 5S^4 + 3S^3 + 2S^2 + 4S + 8$.	4 Marks	L3	CO3	PO4
	b)	Draw the Nyquist plot for the system whose open loop transfer function is, $G(S) = \frac{K}{S(2+S)(10+S)}$. Determine the range of k for which closed loop system is stable.	8 Marks	L3	CO3	PO4

UNIT-IV

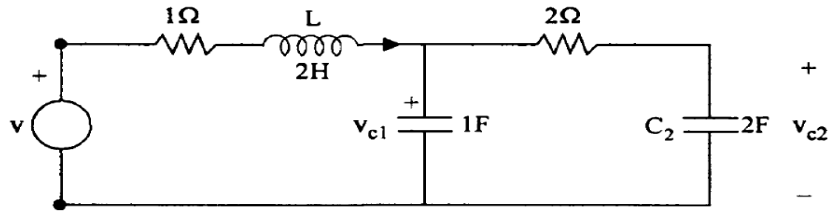
7.		Design a suitable lag compensator so that phase margin is sustained at 40 degree and steady state error for unit ramp input is less than or equal to 0.2 for a given unity feedback open loop system $G(S) = \frac{K}{S(1+2S)}$.	12 Marks	L4	CO4	PO3

(OR)

8.		Design a lead compensator for the unity feedback system given $G(S) = \frac{K}{S(S+1)}$ to meet the following specification i) Velocity error constant=50. ii) Phase margin=20 degree.	12 Marks	L4	CO4	PO3

UNIT-V

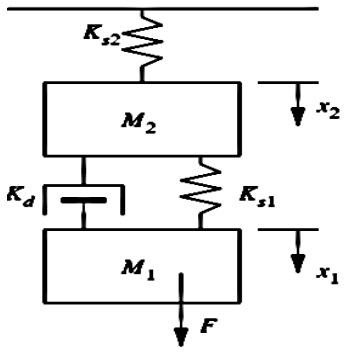
9.		Obtain the state space representation of the electrical system shown in figure:	12 Marks	L3	CO5	PO2



Take $X_1 = I_l$; $X_2 = V_{c1}$; $X_3 = V_{c2}$; $V = U$ *and* $y = V_{c2}$.

(OR)

10.		Obtain the state model of the given mechanical system.	12 Marks	L3	CO5	PO2



CODE No.: 19BT50409 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC19) Supplementary Examinations January - 2022

GREEN TECHNOLOGIES

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	What do you mean by Green Communication? Explain the need for green communications.	6 Marks	L1	CO1	PO1
	b)	Discuss about the energy efficiency metrics of Green Communications.	6 Marks	L2	CO1	PO7
		(OR)				
2.	a)	Identify the need for Green Communications for practical real time societal applications.	7 Marks	L2	CO1	PO6
	b)	Examine the performance tradeoffs of green wireless networks.	5 Marks	L4	CO1	PO2
		UNIT-II				
3.	a)	What is the importance of green energy and mention the adverse effects of conventional energy sources on environment?	6 Marks	L2	CO2	PO7
	b)	Explain the importance of solar energy along with its potential advantages.	6 Marks	L2	CO2	PO6
		(OR)				
4.	a)	Explain in detail about diversification and localization of energy systems.	6 Marks	L2	CO2	PO1
	b)	With neat sketch, elaborate the operation of solar Power plant and justify how the power plant will ensure the environmental sustainability.	6 Marks	L2	CO2	PO7
		UNIT-III				
5.	a)	Bring out the importance of green engineering.	6 Marks	L2	CO3	PO1
	b)	Explain the use of RFID for environmental sustainability.	6 Marks	L2	CO3	PO6
		(OR)				
6.	a)	List out the various steps involved in creating Green IT strategy.	6 Marks	L1	CO3	PO1
	b)	Briefly explain about Balancing the Costs and Benefits of Going Green.	6 Marks	L4	CO3	PO7
		UNIT-IV				
7.	a)	Define green building. Explain why green buildings are necessary.	6 Marks	L2	CO4	PO1
	b)	What is the need of conserving energy and water in buildings?	6 Marks	L2	CO4	PO6
		(OR)				
8.	a)	What is the purpose of green rating system and explain its objectives?	6 Marks	L2	CO4	PO8
	b)	Differentiate LEED and IGBC rating systems.	6 Marks	L4	CO4	PO2
		UNIT-V				
9.	a)	Explain the impact of traditional manufacturing in environmental ecology.	6 Marks	L1	CO5	PO7
	b)	Summarize the motivation and barriers of green manufacturing.	6 Marks	L2	CO5	PO2
		(OR)				
10.	a)	Discuss in detail about the green manufacturing strategies.	6 Marks	L2	CO5	PO1
	b)	Illustrate the concept of green manufacturing through clean energy supply.	6 Marks	L3	CO5	PO2

❀ ❀ ❀

CODE No.: 19BT50505 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC19) Supplementary Examinations January – 2022

ETHICAL HACKING

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	How can worms and viruses be introduced into a company's corporate database?	6 Marks	L3	CO1	PO1
	b)	Describe methods of protecting against malware attacks.	6 Marks	L2	CO2	PO6
		(OR)				
2.	a)	Enumerate the steps to perform Buffer overflow attack.	6 Marks	L2	CO1	PO2
	b)	Are keyloggers different from keykatchers? Justify.	6 Marks	L4	CO1	PO2
		UNIT-II				
3.	a)	Elaborate the concept of foot printing in ethical hacking.	6 Marks	L3	CO2	PO6
	b)	State the art of "Dumpster diving".	6 Marks	L1	CO2	PO6
		(OR)				
4.	a)	Define the types of port scans.	6 Marks	L2	CO2	PO6
	b)	Specify the features of Nmap tool.	6 Marks	L1	CO2	PO6
		UNIT-III				
5.	a)	Explain in detail about different types of DoS attacks.	6 Marks	L2	CO2	PO6
	b)	Discuss briefly about various password cracking techniques.	6 Marks	L3	CO1	PO2
		(OR)				
6.	a)	Explain various DNS spoofing techniques.	6 Marks	L2	CO2	PO6
	b)	Enumerate the steps in performing session hijacking.	6 Marks	L3	CO3	PO8
		UNIT-IV				
7.	a)	With a neat sketch, Discuss the components of web applications.	6 Marks	L3	CO2	PO6
	b)	Outline application vulnerabilities with corresponding countermeasures.	6 Marks	L3	CO2	PO6
		(OR)				
8.	a)	Write a short note on IEEE 802.11 standard.	6 Marks	L1	CO3	PO8
	b)	What are the components of wireless networks? Explain.	6 Marks	L2	CO1	PO1
		UNIT-V				
9.	a)	Write the concept of Man in the middle attack with an example.	6 Marks	L2	CO1	PO1
	b)	Describe Dictionary attack with an example.	6 Marks	L4	CO2	PO6
		(OR)				
10.	a)	Write a short note on Asymmetric algorithms.	6 Marks	L2	CO5	PO6
	b)	Specify the role of honeypots in DoS attacks.	6 Marks	L3	CO1	PO1

CODE No.: 19BT4HS01 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations July – 2022

BANKING AND INSURANCE

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

	UNIT-I				
1.	"Banking is one of the core components of Indian Financial System". Elaborate the significance of the statement, in detail.	12 Marks	L3	CO2	PO5 PO12
	(OR)				
2.	List out various functions of Reserve Bank of India and elaborate them in detail.	12 Marks	L3	CO1	PO3 PO11
	UNIT-II				
3.	Explain various types of deposit products offered by banks, in detail, with examples.	12 Marks	L3	CO1	PO3
	(OR)				
4.	Discuss, in detail, principles of lending in Banks, with examples.	12 Marks	L3	CO2	PO5 PO12
	UNIT-III				
5.	Explain the significance of Electronic Payment System in Banking Industry.	12 Marks	L3	CO1	PO3 PO11
	(OR)				
6.	Discuss various types of Business Models with examples.	12 Marks	L3	CO2	PO3 PO5 PO12
	UNIT-IV				
7.	"Insurance is an important component of risk management", Explain the significance of the statement in detail.	12 Marks	L3	CO2	PO3 PO5 PO12
	(OR)				
8.	Explain, in detail, various elements of insurance with examples.	12 Marks	L3	CO2	PO3 PO12
	UNIT-V				
9.	Elucidate various functions of insurance, in detail.	12 Marks	L3	CO1	PO3 PO11
	(OR)				
10.	Explain the role, significance and contribution of LIC and GIC to the Indian Insurance Industry.	12 Marks	L3	CO2	PO3 PO5 PO12

CODE No.: 19BT4HS02 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations July - 2022

BUSINESS COMMUNICATION AND CAREER SKILLS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain communication skills that are needed to be a successful manager.	6 Marks	L2	CO1	PO1
	b)	Define and explain types of gestures and postures.	6 Marks	L2	CO1	PO1
		(OR)				
2.		"Communication is the life blood of business." Explain why communication is so important to organizations.	12 Marks	L2	CO2	PO5
		UNIT-II				
3.	a)	Enumerate the skills that make crisis communication effective.	6 Marks	L4	CO2	PO2
	b)	Explain the significant features of cross-cultural communication.	6 Marks	L2	CO1	PO2
		(OR)				
4.		Define corporate communication. Explain why cross-cultural communication has become significant in present times.	12 Marks	L1	CO1	PO1
		UNIT-III				
5.	a)	Define business communication. List out the barriers of business communication.	6 Marks	L2	CO1	PO5
	b)	Describe the features of an effective business letter. Talk about its advantages.	6 Marks	L3	CO3	PO5
		(OR)				
6.		Assume yourself to be the purchase manager of ABC systems, 24, Vijay Marg, Patna. Write a complaint letter to Mr. Chauhan, the Marketing Executive reporting that 4 of the 7 consignments have been received in a damaged condition. Ask for the replacement of the damaged along with compensation for the postal charges incurred.	12 Marks	L3	CO3	PO1
		UNIT-IV				
7.	a)	Explain the steps for effective business presentation.	6 Marks	L2	CO4	PO10
	b)	"Electronic résumés are the need of the hour". Discuss its relevance.	6 Marks	L2	CO3	PO10
		(OR)				
8.		Send your resume with covering letter to Soft Solutions, Bangalore for team lead position.	12 Marks	L3	CO3	PO2
		UNIT-V				
9.	a)	Frame 10 questions put by a product-based company while interviewing. Write the questions in order as per the interview.	6 Marks	L2	CO4	PO5
	b)	'Your dress defines what you are even before you start speaking'. What is so important about Grooming in an interview?	6 Marks	L2	CO1	PO1
		(OR)				
10.		"The uncreative mind can spot wrong answers, but it takes a very creative mind to spot wrong questions." Illustrate different kinds of interviews and styles of interviewing.	12 Marks	L2	CO2	PO2

CODE No.: 19BT4HS11 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations July – 2022

PROFESSIONAL ETHICS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain Kohlberg's stages of moral development.	6 Marks	L2	CO1	PO1
	b)	Explain the skills needed to handle problems about moral issues in engineering ethics.	6 Marks	L2	CO3	PO8
		(OR)				
2.		What are moral dilemmas and what steps are necessary in confronting dilemmas.	12 Marks	L2	CO3	PO8
		UNIT-II				
3.	a)	Define virtues. List the types of virtues with suitable example for each.	6 Marks	L4	CO2	PO2
	b)	What is spirituality? How is spirituality promoted in workplace? What are spiritual traits to be developed for excellence in corporate activities?	6 Marks	L4	CO1	PO1
		(OR)				
4.		Briefly explain the professional ideals and virtues with examples.	12 Marks	L2	CO1	PO1
		UNIT-III				
5.	a)	Define 'conscientiousness'.	6 Marks	L2	CO2	PO2
	b)	What is the role of Engineers as responsible experimenters?	6 Marks	L2	CO1	PO1
		(OR)				
6.		Explain code of ethics and its roles, limitations and industrial standards.	12 Marks	L4	CO2	PO2
		UNIT-IV				
7.	a)	Discuss Collegiality and loyalty.	6 Marks	L2	CO1	PO1
	b)	Explain Whistle blowing.	6 Marks	L2	CO1	PO1
		(OR)				
8.		Explain professional rights and responsibilities with examples.	12 Marks	L4	CO2	PO2
		UNIT-V				
9.	a)	Explain Environmental ethics.	6 Marks	L2	CO1	PO1
	b)	What is the role of Engineers as consultants?	6 Marks	L2	CO3	PO8
		(OR)				
10		Describe Intellectual property rights.	12 Marks	L2	CO3	PO8

.

CODE No.: 19BT40103 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations July - 2022

HYDRAULIC ENGINEERING

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define boundary layer. Differentiate between laminar and turbulent boundary layer.	6 Marks	L2	CO1	PO1 PO2
	b)	Explain boundary layer separation with neat sketch. What are the conditions on which separation takes place?	6 Marks	L4	CO1	PO1 PO2 PO10
		(OR)				
2.	a)	Explain the Mechanics of boundary layer transition.	6 Marks	L2	CO1	PO1 PO2 PO10
	b)	Air flows over a flat plate 1m long at a velocity of 6m/s. Determine: i) The boundary layer thickness at the end of the plate. ii) Shear stress at the middle of the plate. iii) Total drag per unit length on the sides of the plate. Take ρ=1.226 kg/m^3 and υ=0.15x10^{-4} m^2/s (0.15 stokes) for air.	6 Marks	L4	CO1	PO1 PO2 PO4 PO10

UNIT-II

3.	a)	Derive the expression for depth of hydraulic jump and obtain the loss of energy due to jump stating all assumptions.	6 Marks	L4	CO2	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO10
	b)	A trapezoidal channel has side slopes of 3 horizontal to 4 vertical and slope of its bed is 1 in 2000. Determine the optimum dimensions of the channel, if it is to carry water at 0.5m^3/s. Take C=80.	6 Marks	L6	CO2	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO10
		(OR)				
4.	a)	Explain specific energy and specific energy curve. Obtain the condition for maximum discharge for a given value of specific energy.	8Marks	L4	C02	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO10

	b)	Compare and contrast rapidly varied flow and gradually varied flow.	4Marks	L4	CO2	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO10
		UNIT-III				
5.	a)	Prove that the force exerted by a jet of water on a fixed semi-circular plate in the direction of the jet when the jet strikes at the center of the semi-circular plate is two times the force exerted by the jet on an fixed vertical plate.	6 Marks	L5	CO3	PO1 PO2 PO4 PO6 PO10
	b)	A jet of water of diameter 50mm strikes a fixed plate in such a way that the angle between the plate and the jet is 30^0. The force exerted in the direction of the jet is 1471.5N. Determine the rate of flow of water.	6 Marks	L6	CO3	PO1 PO2 PO4 PO6 PO10
		(OR)				
6.	a)	Derive the expression for the force and work done on a moving Curved plate when the jet strikes the plate at centre.	6 Marks	L4	CO3	PO1 PO2 PO4 PO6 PO10
	b)	A jet of water 120 mm in diameter and moving with a velocity of 25 m/s strikes normally on a flat plate. Determine the force exerted on the plate and the work done when the plate is stationary, the plate is moving with a velocity of 8 m/s in the direction of the jet, and the plate is moving with a velocity of 8 m/s towards the jet.	6 Marks	L6	CO3	PO1 PO2 PO4 PO6 PO10
		UNIT-IV				
7.	a)	A Francis turbine has a wheel diameter of 1.2 m at the entrance and 0.6m at the exit. The blade angle at the entrance is 90^0 and the guide vane angle is 15^0. The water at the exit leaves the blades without any tangential velocity. The available head is 30m and the radial component of flow velocity is constant. What would be the speed of wheel in rpm and blade angle at exit? Neglect friction.	6 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO10
	b)	Define specific speed of a turbine. Derive the expression for the specific speed of turbine.	6 Marks	L4	CO4	PO1 PO2 PO3 PO10
		(OR)				
8.	a)	Discuss in detail the different components of hydroelectric power plants.	6 Marks	L2	CO4	PO1 PO2 PO10
	b)	Define: i) Firm and secondary power. ii) Load factor, utilization factor and capacity factor.	6 Marks	L4	CO4	PO1 PO2 PO3

UNIT-V

9.	a)	Define centrifugal pump and explain various components of a Centrifugal pump with a neat sketch.	6 Marks	L4	CO5	PO1 PO2 PO3 PO4 PO10
	b)	Discuss the operating characteristic of centrifugal pump with neat sketches.	6 Marks	L4	CO5	PO1 PO2 PO4 PO6 PO10
		(OR)				
10.	a)	A centrifugal pump delivers water against a net head of 10m at a speed of 100 r.p.m. The vanes are curved backward and make an angle of 30 degrees. The impeller outside diameter is 30cm and has a width of 5cm at the outlet. Determine the discharge if manometric efficiency is 95%.	8 Marks	L6	CO5	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO10
	b)	Explain: i) Cavitation. ii) Loses in pumps.	4 Marks	L4	CO5	PO1 PO2 PO3 PO4 PO5 PO10

CODE No.: 19BT40104 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations July – 2022

SOIL MECHANICS

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What are residual and transported soils? List the types of soils formed along with their transporting agents.	6 Marks	L2	CO1	PO1 PO2
	b)	A soil has Liquid Limit of 25% and Flow Index of 12.5%. If the Plastic Limit is 15%, determine the Plasticity Index and toughness index. If for the above soil, the natural moisture content is 20%; find the liquidity index and Consistency Index.	6 Marks	L3	CO1	PO1 PO2 PO4
		(OR)				
2.	a)	Explain the IS classification of fine-grained soils.	6 Marks	L1	CO1	PO1
	b)	In order to find the relative density of sandy soil, a mould of Volume 1000ml was used. When the sand was dynamically compacted in the mould, its mass was 2.10kg whereas when the sand was poured loosely, its mass was 1.635kg. If the in-situ dry density of the soil was 1.5Mg/m^3. Calculate the relative density of the soil. Take G=2.70 and assume the sand is saturated.	6 Marks	L3	CO1	PO1 PO2 PO4

UNIT-II

3.	a)	Explain the factors effecting permeability of soils.	6 Marks	L2	CO2	PO1
	b)	A permeameter of diameter 82.5mm contains a column of fine sand 460mm long. When the water flows through it under a constant head at a rate of 191 ml/min, the loss of the head between two pints 250mm apart is 380mm, calculate the coefficient of permeability. If falling head test is made on the same sample using a stand pipe of dia. 30mm, in what time will the water level in the stand pipe fall from 1560mm to 1066mm above outflow level.	6 Marks	L3	CO2	PO1 PO2 PO4
		(OR)				
4.	a)	What is a flow net? Explain the characteristics and uses of flow nets.	6 Marks	L2	CO2	PO1 PO10
	b)	A 10m thick bed of sand is underlain by a layer of clay of 6m thickness. The water table which was originally at the ground surface is lowered by drainage to a depth of 4m, whereupon the degree of saturation above the lowered water table reduces to 20%. Determine the increase in magnitude of vertical effective pressure at the middle of the clay layer due to lowering of water table. The saturated unit weights of sand and clay are respectively 20.6kN/m^3 and 17.6kN/m^3. Dry density of sand is 16.7 kN/m^3. Take G_s for sand as 2.70.	6 Marks	L3	CO2	PO1 PO2 PO4 PO10

UNIT-III

5.	a)	Calculate the average vertical stress at a depth of 4m below a footing with dimensions 2m by 1m, exerting a uniform pressure of 750 kN/m^2 on the soil. Assume 2:1 stress distribution.	6 Marks	L3	CO3	PO1 PO2 PO4
	b)	An elevated structure with a total weight of 10000kN is supported on a tower with 4 legs. The legs rest on piers located at the corners of a square 6m a side. What is the vertical stress increment due to this loading at a point 7m beneath the center of the structure?	6 Marks	L3	CO3	PO1 PO2 PO4

(OR)

6.	a)	A laboratory compaction test conducted on a sample of soil gave the following results.	6 Marks	L3	CO3	PO1 PO2 PO4 PO10

Bulk density (g/cc)	Moisture content (%)
2.06	12.8
2.13	14.2
2.15	15.6
2.16	16.8
2.14	17.8

Find the maximum dry density and optimum moisture content.

	b)	Explain the effect of compaction on soil properties.	6 Marks	L2	CO3	PO1

UNIT-IV

7.	a)	Explain spring analogy for primary consolidation.	6 Marks	L2	CO4	PO1
	b)	In a consolidation test on a soil, the void ratio of the sample decreased from 1.25 to 1.10 when the pressure increased from 200KN/m² to 400KN/m². Calculate the coefficient of consolidation, if the coefficient of permeability is 8×10^{-8} cm/sec.	6 Marks	L3	CO4	PO1 PO2 PO4

(OR)

8.	a)	Define Initial, primary and secondary consolidation.	6 Marks	L2	CO4	PO1
	b)	Determine the settlement of a footing resting on a saturated soil with properties as given below. The thickness of the compressible soil is 3m. The increase in pressure at the center of the layer is 50kPa and the pre-consolidation pressure is 50kPa. If the coefficient of consolidation is 1.8×10^{-7} m²/s, determine the time in days for 90% consolidation. Assume one-way drainage. Void ratio of the soil = 0.70 Specific gravity of the soil = 2.60 Compression index = 0.15	6 Marks	L3	CO4	PO1 PO2 PO4

UNIT-V

9.	a)	Derive the expression for Mohr-Coulomb failure criterion to determine the shear parameters from principal stresses.	6 Marks	L2	CO5	PO1 PO2
	b)	A direct shear test was conducted on a specimen of dry sand with a normal stress of 200 kN/m². Failure occurred at a shear stress of 175 kN/m². The size of the specimen tested was 75mm x 75mm x 30mm (height). Determine the angle of friction. For a normal stress of 150 kN/m², what shear force would be required to cause failure in the specimen?	6 Marks	L3	CO5	PO1 PO2 PO4 PO10

(OR)

10.	a)	Explain briefly about the types of shear tests based on drainage conditions.	6 Marks	L3	CO5	PO1 PO2
	b)	Two identical specimens of a soil were tested in a tri axial apparatus. First specimen failed at a deviator stress of 770 kN/m² under a cell pressure of 200 kN/m² while the second specimen failed at a deviator stress of 1370 kN/m² under a cell pressure of 400 kN/m². Determine the shear parameters.	6 Marks	L3	CO5	PO1 PO2 PO4 PO10

❀ ❀ ❀

CODE No.: 19BT40105 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations July – 2022

STRUCTURAL ANALYSIS

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

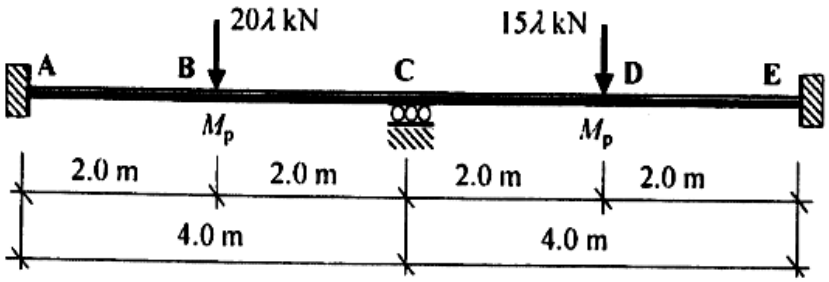
1.	a)	Derive the relation between curvature, slope and deflection.	4 Marks	L4	CO1	PO1 PO2 PO4 PO5 PO10
	b)	A cantilever beam ABC, fixed at A, B at middle of the beam and cantilever at C. AB = 2m and BC = 2m. The Moment of Inertia for AB = 2I and BC = I. The point load 20kN is acting at points B and C. Determine the slope at point "C" of the beam. Use Conjugate Beam Method**.**	8 Marks	L4	CO1	PO1 PO2 PO4 PO5 PO10
		(OR)				
2.	a)	A cantilever beam of length l carries an UDL of W kN/m throughout the beam. Determine the slope and deflection by moment area method.	4 Marks	L4	CO1	PO1 PO2 PO4 PO5 PO10
	b)	Determine the Slope and deflection at the free end of a cantilever of length 4m carries a uniformly distributed load of 20 kN/m length over the entire length if the moment of $I=7.95 \times 10^7 mm^4$ and $E = 2 \times 105$ N/mm². Use Double Integration method**.**	8 Marks	L4	CO1	PO1 PO2 PO4 PO5 PO10

UNIT-II

3.	a)	Determine the deflection at the free end of the cantilever of length 3m subjected to a UDL of 5kN/m throughout the length by using Strain Energy Method**.**	4 Marks	L4	CO2	PO1 PO2 PO4 PO5 PO10
	b)	A fixed beam AB of span 12m carries a point load 30kN and 40kN at distances 4m and 8m from the left end respectively. Determine the Fixed end moments and reactions at the supports. Draw the SF and BM diagrams of the given beam.	8 Marks	L4	CO2	PO1 PO2 PO4 PO5 PO10
		(OR)				
4.	a)	Using strain energy method, determine the deflection at the free end of the cantilever beam of length L subjected to a UDL load throughout the beam.	4 Marks	L4	CO2	PO1 PO2 PO4 PO5 PO10
	b)	A fixed beam 8m span carries a point load of 20 kN acting at 4m of length starting from left end and a concentrated load of 20kN at a distance of 7m from the left end. Determine the Fixed end moments and draw the SF and BM diagrams.	8 Marks	L4	CO2	PO1 PO2 PO4 PO5

						PO10
		UNIT-III				
5.	a)	Draw the sign conventions considered in Slope deflection method.	4 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO10
	b)	A continuous beam ABC, is carrying a uniformly distributed load of 4 kN/m on AB in addition to a concentrated load of 12kN is acting on BC. AB – 6m and BC – 2m. Draw bending moment diagram by using slope deflection method.	8 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO10
		(OR)				
6.	a)	Write the Clapeyron's theorem of three moments equation and explain each parameter.	4 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO10
	b)	Analyze the continuous beam ABC of Span 9m. AB – 6m and BC – 3m, An UDL of 10kN/m is acting on throughout the span. Determine the support moments by using by Clapeyron's Theorem of three moment equation method. Take EI=Constant.	8 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO10
		UNIT-IV				
7.	a)	Explain about relative stiffness with example.	4 Marks	L4	CO4	PO1 PO2 PO4 PO5 PO10
	b)	A continuous beam ABC, fixed at A and Hinges at B and C., is carrying a uniformly distributed load of 5kN/m on AB in addition to a concentrated load of 10kN is acting on BC. AB – 6m and BC – 2m. Draw bending moment diagram by using moment distribution method.	8 Marks	L4	CO4	PO1 PO2 PO4 PO5 PO10
		(OR)				
8.	a)	Explain about Rotation Factors in Kani's method with example.	4 Marks	L4	CO4	PO1 PO2 PO4 PO5 PO10
	b)	A continuous beam ABC, Fixed at A and Roller at B and C., is carrying a uniformly distributed load of 8kN/m on AB in addition to a concentrated load of 10kN is acting on BC. AB – 4m and BC – 4 m. Determine the moments by Kani's method and draw BMD.	8 Marks	L4	CO4	PO1 PO2 PO4 PO5 PO10
		UNIT-V				
9.	a)	What is the use of influence line diagram and State Muller Breslau's principle?	4 Marks	L4	CO5	PO1 PO2 PO4 PO5 PO10

	b)	A simply supported beam has a span of 16 m is subjected to a UDL (dead load) of 5kN/m and a UDL (live load) of 8kN/m (longer than the span) traveling from left to right. Draw the ILD for shear force and bending moment at a section 4m from the left end. Use these diagrams to determine the maximum shear force and bending moment at this section.	8 Marks	L4	CO5	PO1 PO2 PO4 PO5 PO10
		(OR)				
10.	a)	Explain what is Load factor and Factor of safety in Plastic Analysis.	4 Marks	L4	CO5	PO1 PO2 PO4 PO5 PO10
	b)	Calculate the plastic moment capacity required for the continuous beam with working loads and consider a minimum load factor $\lambda = 1.7$.	8 Marks	L4	CO5	PO1 PO2 PO4 PO5 PO10



CODE No.: 19BT40107 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations July – 2022

SUSTAINABLE ENGINEERING

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	How the economical issues and legal issues do affects the sustainable development.	6 Marks	L4	CO1	PO1 PO2 PO6 PO7
	b)	What would happen without Montreal Protocol? Explain in detail.	6 Marks	L3	CO1	PO1 PO4 PO6 PO7 PO8
		(OR)				
2.	a)	If the city Vizag need to be disaster resilient, which factors do we consider for that?	6 Marks	L5	CO1	PO1 PO2 PO4 PO7
	b)	How do you implement the six principles of sustainability in detail?	6 Marks	L3	CO1	PO1 PO6 PO7 PO8

UNIT-II

3.	a)	How do you analyze a life cycle? Describe the steps involved in it with any example.	6 Marks	L4	CO2	PO1 PO2 PO5 PO10
	b)	Explain the social and economic indicators for sustainability measurement.	6 Marks	L2	CO2	PO1 PO4 PO6
		(OR)				
4.	a)	Draw the flow chat and explain in brief the environmental health risk assessment model.	6 Marks	L4	CO2	PO1 PO2 PO6 PO11
	b)	Distinguish the advantages and disadvantages of Streamlined life-cycle assessment.	6 Marks	L4	CO2	PO1 PO6 PO10

UNIT-III

5.	a)	What is Green building and mention its importance in sustainable urban planning?	6 Marks	L2	CO3	PO1 PO4 PO6 PO7
	b)	Interpret the advantages and challenges of waste management in	6 Marks	L3	CO3	PO1

		detail with an example.				PO2 PO7
		(OR)				
6.	a)	Explain any 5 construction planning impacting sustainable building.	6 Marks	L2	CO3	PO1 PO4 PO6 PO7
	b)	Distinguish the advantages and disadvantages of any two sustainable energies in terms of economical and environmental point of view.	6 Marks	L4	CO3	PO1 PO2 PO6 PO7
		UNIT-IV				
7.	a)	Compare the unique aspects of IGBC and GRIHA rating system is different than each other.	6 Marks	L4	CO4	PO1 PO2 PO3 PO5 PO7
	b)	Which areas to assess for a building or a project consider for rating?	6 Marks	L3	CO4	PO1 PO2 PO3 PO5 PO7
		(OR)				
8.	a)	Evaluate any one Materials engineering project as an example by sustainability tools.	6 Marks	L5	CO4	PO1 PO2 PO3 PO7
	b)	Discuss the social and environmental sustainability in detail.	6 Marks	L2	CO4	PO1 PO2 PO7
		UNIT-V				
9.	a)	Describe the United Nations sustainable development goals.	6 Marks	L2	CO5	PO1 PO2 PO3 PO7 PO8 PO10
	b)	Distinguish between industrial ecology and industrial symbiosis.	6 Marks	L4	CO5	PO1 PO2 PO7
		(OR)				
10.	a)	What are the key elements for creating an industrial as energy efficient?	6 Marks	L2	CO5	PO1 PO2 PO4 PO6 PO7
	b)	How are urbanization and industrialization related? And explain them in detail.	6 Marks	L4	CO5	PO1 PO2 PO7 PO8

❀ ❀ ❀

CODE No.: 19BT40201 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations July - 2022

DIGITAL ELECTRONICS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

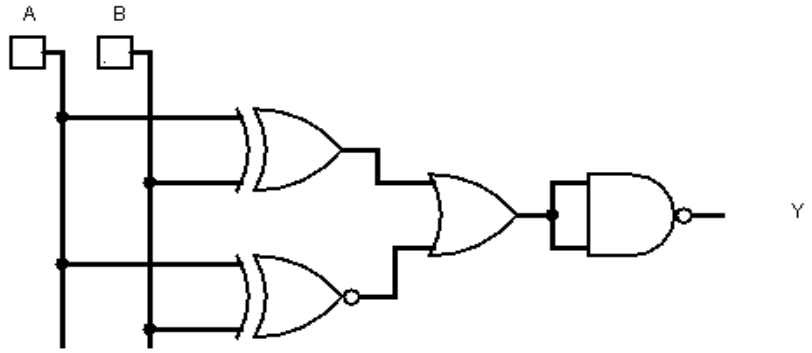
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Illustrate the procedure to convert a decimal number to an equivalent number in any number system with examples.	12 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Implement EX-OR using minimum number of NAND gates.	6 Marks	L2	CO1	PO1
	b)	Reduce the expression. $F = \sum m(0,1,4,5,6,7,9,11,15) + d(10,14)$ *using K - map*	6 Marks	L3	CO1	PO1

UNIT-II

3.	a)	Explain the operation of de-multiplexer by taking 1:2 in to the account.	6 Marks	L4	CO3	PO2
	b)	Describe the operation of the following combinational logic circuit with truth table.	6 Marks	L4	CO3	PO2



(OR)

4.	a)	Design a 4x1 Multiplexer and draw its functional table.	6 Marks	L2	CO1	PO1
	b)	Design a combinational circuit with four inputs and four outputs. The output generates the 2's complement of the input binary number.	6 Marks	L4	CO3	PO4

UNIT-III

5.	a)	With the help of block diagram, explain the working of a JK flip flop.	6 Marks	L4	CO3	PO2
	b)	Clearly explain the working of a 4-bit binary-up counter with T flip-flop. Draw the logic diagram and give its excitation table.	6 Marks	L2	CO5	PO8
		(OR)				
6.		Illustrate the operation of Mod-6 synchronous counter.	12 Marks	L4	CO2	PO2

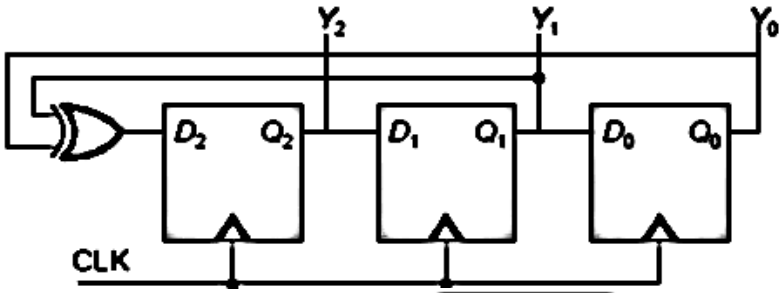
UNIT-IV

7. Minimize the sequential machine represented in the state table shown below using merger table. — 12 Marks — L4 — CO3 — PO2

Present State	Next State , Z	
	X=0	X=1
A	B,1	H,1
B	F,1	D,1
C	D,0	E,1
D	C,0	E,1
E	D,1	C,1
F	C,1	C,1
G	C,1	D,1
H	C,0	A,1

(OR)

8. A three bit pseudo random number generator is shown. Initially the value of output $Y = Y_2Y_1Y_0$ is set to 111. The value of output Y after three clock cycles is. — 12 Marks — L4 — CO3 — PO4



UNIT-V

9. What is the difference between PLA and PAL? Implement half substractor using PLA and PAL model. — 12 Marks — L3 — CO4 — PO6

(OR)

10. Analyze the following Boolean functions using PAL with AND-OR structure. — 12 Marks — L3 — CO4 — PO6

F1 (A,B,C,D)=∑m(2, 12, 13)
F2 (A,B,C,D)=∑m(7, 8, 9, 10, 11, 12, 13, 14, 15)
F3 (A,B,C,D)=∑m(0, 2, 3, 4, 5, 6, 7, 8, 10, 11, 15)
F4 (A,B,C,D)=∑m(1, 2, 8, 12, 13)

❀ ❀ ❀

CODE No.: 19BT40202 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations July – 2022

ELECTRICAL MACHINES-II

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain how a synchronously rotating magnetic field with constant magnitude is produced in a 3-phase induction motor when a balanced 3-phase supply is applied to its balanced 3-phase stator winding.	8 Marks	L2	CO1	PO1
	b)	Write a note on losses in induction motor.	4 Marks	L1	CO1	PO1
		(OR)				
2.	a)	The power input to the rotor of a 440V, 50Hz, 3-phase, 6-pole induction motor is 50kW. The rotor **emf** makes 120 cycles per minute. Friction and windage losses are 2kW. Calculate i) Rotor copper losses ii) Mechanical power developed iii) Output power iv) Output torque.	8 Marks	L3	CO1	PO2
	b)	Compare deep bar induction motor with a double cage induction motor.	4 Marks	L4	CO1	PO1

UNIT-II

3.	a)	Why starter is required to start 3-phase induction motors? Explain primary resistance starter.	6 Marks	L1	CO1	PO3
	b)	Explain the autotransformer starter used for three phase induction motors. Derive the expression for starting torque.	6 Marks	L2	CO1	PO5
		(OR)				
4.	a)	With neat diagram, explain Scherbius scheme for speed control of induction motor.	6 Marks	L2	CO1	PO7
	b)	A cascade set consists of two motors A and B with 4 poles and 6 poles respectively. The motor is connected to a 50Hz supply. Find i) the speed of the set ii) the electric power transferred to motor B when the input to motor A is 25kW. Neglect losses.	6 Marks	L3	CO1	PO4

UNIT-III

5.	a)	What are the methods used to reduce harmonics in three phase alternators? Explain.	4 Marks	L1	CO2	PO3
	b)	A 3-phase, 16-pole alternator has a star-connected winding with 144 slots and 12 conductors per slot. The flux per pole is 0.03wb, sinusoidally distributed and the speed is 375 r.p.m. Find the frequency, phase and line **emf**. Assume full pitched coil.	8 Marks	L3	CO2	PO2
		(OR)				
6.	a)	Define armature reaction. Discuss the nature of armature reaction of an alternator for zero **pf** lagging, zero **pf** leading and unity **pf** load.	8 Marks	L1	CO2	PO1
	b)	A 4-pole alternator has an armature with 25 slots and 8 conductors per slot and rotates at 1500 r.p.m and flux per pole is 0.05wb. Calculate the **emf** generated if winding factor is 0.96 and all conductors are in series.	4 Marks	L3	CO2	PO4

UNIT-IV

7.	a)	Explain synchronisation of alternators with necessary conditions. Give any one method in detail.	8 Marks	L2	CO3	PO6
	b)	What is synchronizing power? Explain its significance with parallel operation of alternators.	4 Marks	L1	CO3	PO1

(OR)

8.	a)	Discuss the effect of change in the input power on the two alternators running in parallel.	6 Marks	L2	CO3	PO2
	b)	What is the necessity of parallel operation of alternators? Derive the expression for load sharing between two alternators.	6 Marks	L1	CO3	PO7

UNIT-V

9.		Explain the various starting methods of synchronous motor with necessary diagrams.	12 Marks	L3	CO4	PO5

(OR)

10.	a)	What is hunting? Explain how it can be minimized in the synchronous motor.	6 Marks	L1	CO4	PO3
	b)	Explain briefly how a synchronous motor can be operated as a synchronous condenser.	6 Marks	L2	CO4	PO1

CODE No.: 19BT40203 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations July – 2022

ELECTRICAL MEASUREMENTS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	With neat sketch, describe in detail the construction and working of a Moving Iron (MI) type instrument by incorporating the spring control and eddy current damping systems for AC and DC quantities measurements. Also, list its merits and demerits.	6 Marks	L2	CO1	PO1
	b)	Give the basic principle of working of an electrostatic voltmeter. Explain how would you increase: i) The operating forces. ii) Voltage range of the voltmeter.	6 Marks	L4	CO1	PO3
		(OR)				
2.	a)	Describe the feature incorporated in an electro dynamometer wattmeter to make it a low power factor type of wattmeter.	6 Marks	L2	CO1	PO1
	b)	Explain the procedure to measure power using instrument transformers with the help of phasor diagrams and correction factors.	6 Marks	L3	CO1	PO2
		UNIT-II				
3.	a)	Explain the errors caused because of connections in Electrodynamometer (EDM) type wattmeter and suggest suitable measures to minimize the errors.	6 Marks	L2	CO2	PO1
	b)	Explain the working of a 3 phase dynamometer wattmeter. Draw a neat sketch of the wattmeter and also its connections.	6 Marks	L3	CO2	PO2
		(OR)				
4.	a)	Explain the theory and shape of scale of electrodynamometer wattmeters.	6 Marks	L3	CO2	PO1
	b)	Derive the expression for deflecting torque in single phase induction type meters. Show that the deflection is maximum, when the phase angle between two fluxes is 900 and when the disc is purely non-inductive.	6 Marks	L3	CO2	PO6
		UNIT-III				
5.	a)	Explain the theory and shape of scale of electrodynamometer wattmeters.	6 Marks	L2	CO3	PO1
	b)	A dynamometer type of wattmeter is rated 10 A and 100 V with a full scale reading of 1000 W. The inductance of the voltage circuit is 5 mH and its resistance is 3000 Ω. If the voltage drop across the current coil of the wattmeter is negligible, what is the error in the wattmeter at the rated VA rating with zero power factor? Assume frequency is 50 Hz.	6 Marks	L4	CO3	PO4
		(OR)				

6.	a)	Describe in detail suitable standardization method used for the standardization of AC voltmeter using AC potentiometers.	6 Marks	L3	CO3	PO5
	b)	Explain the working of Coordinate type ac Potentiometer with neat sketch.	6 Marks	L3	CO3	PO2

UNIT-IV

7.	a)	Mention the different methods used for measurement of high resistance and explain in detail the Loss of charge method.	6 Marks	L2	CO4	PO1
	b)	Describe how relative permittivity of a specimen of insulating material can be determined using a schering bridge.	6 Marks	L3	CO4	PO4
		(OR)				
8.	a)	Describe the working of hay's bridge for measurement of inductance. Derive the equations for balance condition.	6 Marks	L3	CO4	PO5
	b)	Write short notes on the following with neat sketches: i) Flux meter. ii) Core loss measurement by Bridges.	6 Marks	L3	CO4	PO2

UNIT-V

9.	a)	What are the methods available for determination of B.H. Curve? Explain them neatly.	6 Marks	L2	CO5	PO1
	b)	Explain lissajous pattern with two equal voltages of same frequency and phase shift of ϕ (not equal to 00 or 900).	6 Marks	L4	CO5	PO2
		(OR)				
10.	a)	Explain the basic circuitry of cathode ray oscilloscope.	6 Marks	L2	CO5	PO6
	b)	Explain about ballistic tests for the determination of magnetic flux density, magnetizing force, magnetic potentiometer, B-H curve and Hysteresis loop.	6 Marks	L2	CO5	PO1

CODE No.: 19BT40204 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

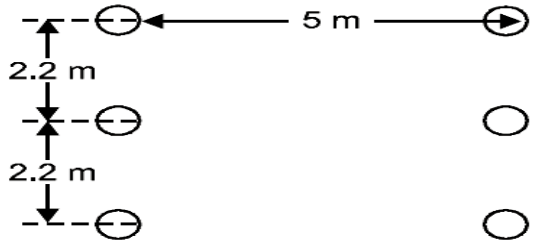
II B.Tech II Semester (SVEC-19) Supplementary Examinations July – 2022

TRANSMISSION AND DISTRIBUTION

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

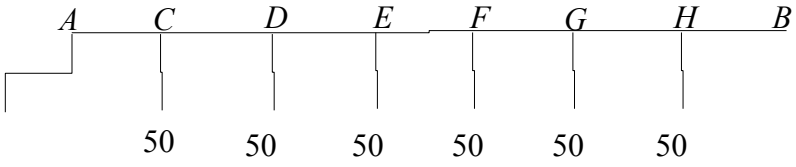
		UNIT-I				
1.	a)	A 3-phase double circuit line is shown below. Radius of each conductor is 1cm. Determine the capacitance and charging current per km assuming the line is transposed and operating voltage is 220 KV, 50 Hz 	6 Marks	L3	CO1	PO1
	b)	A single core cable has a core diameter of 8 mm and a diameter under the sheath of 2cm. The relative permittivity of the dielectric is 4. Calculate for 1 km length of the cable i) the capacitance ii) its equivalent insulation resistance iii) the charging current when the cable is connected to 10 kV, 1-phase 50 Hz supply system.	6 Marks	L3	CO1	PO1
		(OR)				
2.	a)	A 200 km, 3-phase transmission line has its conductors placed at the corners of an equilateral triangle of 2.5 m side. The radius of each conductor is 2 cm. Calculate: i) Line to neutral capacitance of the line ii) Charging current per phase if the line is maintained at 66 kV, 50Hz.	6 Marks	L4	CO1	PO2
	b)	Derive the expression for voltage regulation of medium transmission line if the line is represented by nominal-π.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Derive the expression wave equation of a traveling wave.	6 Marks	L2	CO2	PO6
	b)	Express A, B, C and D constants for medium transmission line if the line is represented by nominal-T.	6 Marks	L3	CO2	PO1
		(OR)				
4.	a)	A 220kV short 3-phase transmission line has series line impedance per phase of (20+j50)Ω. Then line delivers a load of 50 MW at 0.7 pf lag. Determine the regulation of the line and the A, B, C, D parameter of the line.	8 Marks	L3	CO2	PO1
	b)	Define and write the expressions for Voltage Regulation and Efficiency of a transmission line.	4 Marks	L2	CO2	PO1
		UNIT-III				
5.	a)	An overhead transmission line at a river crossing is supported from two towers at a height of 30m and 70m above water level. The horizontal distance between the towers is 250m. If the required clearance between the conductor and the water midway between the towers is 45m and the weight of the conductor is 0.8 kg/m. Analyze the tension in the conductor.	8 Marks	L4	CO3	PO2

	b)	List out the factors that affect sag in the transmission line.	4 Marks	L2	CO3	PO6

(OR)

6.	a)	Briefly describe the methods of reducing corona effect.	5 Marks	L2	CO3	PO12
	b)	A string of 5 insulators is connected across three phase, 100kV line. If the self capacitance of each unit is equal to 5 times pin to earth capacitance. Calculate the potential difference across each unit and string efficiency.	7 Marks	L3	CO3	PO1

UNIT-IV

7.	a)	A 2-wire DC distributor *AB* is fed at A and supplies six concentrated loads each of 50A at *C, D, E, F, G* and *H* as shown in figure below. What must be the resistance of each section so that maximum voltage drop for any consumer does not exceed 7 volts? Also calculate the power loss with this resistance. Assume $AC = CD = DE = EF = FG = GH = HB$ 	6 Marks	L3	CO4	PO1
	b)	A 2 wire DC Distributor AB, 1000m long has a total resistance of 0.1 Ω. The ends A & B are fed at 240V. The distributor is uniformly loaded at 0.5 A/m length and has concentrated loads of 120A, 60A, 100A and 40A at distances of 200, 400, 700 and 900m respectively from end A. Calculate: i) the point of minimum potential ii) value of minimum potential iii) current fed at both ends. iv) what would be the resistance of distributor if the maximum permissible drop is restricted to 15 V.	6 Marks	L4	CO4	PO2

(OR)

8.	a)	A 2-wire DC distributor AB 900m long is fed at 400V and loads of 50A, 100A and 150A are tapped off from C, D and E which are at a distance of 200m, 500m and 800m from point A respectively. The distributor is also loaded uniformly at the rate of 0.5A/m. If the resistance of the distributor per meter (go & return) is 1×10^{-4} Ω, calculate i) voltages at points B & D and ii) Power loss in the distributor.	6 Marks	L4	CO4	PO2
	b)	A single phase distributor AB has a total impedance of (0.1+j0.2)Ω. At the far end B, a current of 80A at 0.8 p.f. lagging and at mid-point C a current of 100A at 0.6 p.f. lagging are tapped. If the voltage of the far end is maintained at 200V, determine: i) Supply end voltage V_A ii) Phase angle between V_A and V_B	6 Marks	L3	CO4	PO1

UNIT-V

9.	a)	Explain various distribution planning models.	6 Marks	L2	CO5	PO1
	b)	List out various bus bar schemes and explain any four schemes with circuit diagram, advantages and disadvantages.	6 Marks	L2	CO5	PO1

(OR)

10.	a)	Draw the 132kV/33kV substation layout.	6 Marks	L3	CO5	PO12
	b)	Discuss about the classification of different types of substations. State the advantages and disadvantages of each substation.	6 Marks	L2	CO5	PO1

❀ ❀ ❀

CODE No.: 19BT40301 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations July - 2022

DYNAMICS OF MACHINERY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain about Prony and Rope brake dynamometers in brief.	6 Marks	L2	CO1	PO1
	b)	Compare Single Band brake and Differential band brake.	6 Marks	L2	CO1	PO1 PO2
		(OR)				
2.		An effective diameter of the cone clutch is 75 mm. The semi-angle of the cone is 18°. Find the torque required to produce slipping of the clutch if an axial force applied is 200 N. This clutch is employed to connect an electric motor running uniformly at 100 r.p.m with a flywheel which is initially stationary. The flywheel has a mass of 13.5 kg and its radius of gyration is 150 mm. Calculate the time required for the flywheel to attain full speed, and also the energy lost in the slipping of the clutch. Take coefficient of friction as 0.3.	12 Marks	L3	CO1	PO1 PO2 PO3

UNIT-II

3.	a)	Derive the expression for Gyroscopic Couple.	4 Marks	L2	CO2	PO1
	b)	An aeroplane makes a complete half circle of 90 metres radius, towards left, when flying at 270km per hour. The rotary engine and the propeller of the plane has a mass of 450kg with a radius of gyration of 360mm. The engine runs at 2700 r.p.m. clockwise, when viewed from the rear. Find the gyroscopic couple on the aircraft and state its effect on it.	8 Marks	L3	CO2	PO1 PO2 PO3 PO4
		(OR)				
4.	a)	Explain what do you understand by gyroscopic stabilization	4 Marks	L2	CO3	PO1
	b)	A ship is propelled by a rotor of mass 2000kg rotates at a speed of 2400 r.p.m. The radius of gyration of rotor is 0.4m and spins clockwise direction when viewed from stern. Find the gyroscopic couple and its effect when: i) The ship takes left turn at a radius of 350m with a speed of 35kmph ii) The ship pitches with the bow rising at an angular velocity of 1rad/s iii) The ship rolls at an angular velocity of 0.15rad/s.	8 Marks	L3	CO3	PO1 PO2 PO3 PO4

UNIT-III

5.	a)	Derive the expression for the height of Proell governor	6 Marks	L2	CO4	PO1
	b)	In an engine governor of the Porter type, the upper and lower arms are 200mm and 250mm respectively and pivoted on the axis of rotation. The mass of the central load is 15kg, the mass of each ball is 2kg and friction of the sleeve together with the resistance of the operating gear is equal to a load of 25N at the sleeve. If the limiting inclinations of the upper arms to the vertical are 30° and 40°, find, taking friction into account, range of speed of the governor.	6 Marks	L3	CO4	PO1 PO2 PO3 PO4 PO5 PO6
		(OR)				

6.	a)	Discuss the merits and demerits of spring controlled and gravity controlled governors.	4 Marks	L2	CO4	PO1 PO2 PO3 PO4 PO5 PO6
	b)	Porter governor has equal arms each 250mm long and pivoted on the axis of rotation. Each ball has a mass of 5Kg and the mass of the central load on the sleeve is 25kg. The radius of rotation of the ball is 150mm when the governor begins to lift and 200mm when the governor is at maximum speed. Find the maximum and minimum speeds and range of speed of the governor.	8 Marks	L3	CO4	PO1 PO2 PO3 PO4 PO5 PO6
		UNIT-IV				
7.		Three masses of 8kg, 12kg and 15kg attached at radial distances of 80mm, 100mm and60mm respectively to a disc on a shaft are in complete balance. Determine the angular positions of the masses of 12kg and 15kg relative to 8kg mass.	12 Marks	L3	CO5	PO1 PO2 PO3 PO6
		(OR)				
8.		Four masses m_1, m_2, m_3 and m_4 are 200 kg, 300 kg, 240 kg and 260 kg respectively. The corresponding radii of rotation are 0.2m, 0.15m, 0.25m and 0.3m respectively and the angles between successive masses are 45°, 75° and 135°. Find the position and magnitude of the balance mass required, if its radius of rotation is 0.2m.	12 Marks	L3	CO5	PO1 PO2 PO3
		UNIT-V				
9.	a)	A vibrating system consisting of a weight of 22.27N and a spring of stiffness 15.2N/cm, is viscously damped such that the ratio of two consecutive amplitudes is 1.0 to 0.98. Determine: i) Frequency of damped oscillations. ii) Logarithmic decrement. iii) Damping factor. iv) Damping coefficient.	6 Marks	L3	CO6	PO1
	b)	A shaft 50mm diameter and 3 metres long is simply supported at the ends and carries three loads of 1000N, 1500N and 750N at 1m, 2m and 2.5m from the left support. The Young's modulus for shaft material is 200GN/m^2. Find the frequency of transverse vibration.	6 Marks	L3	CO6	PO1 PO2 PO3 PO4 PO5
		(OR)				
10.		A coil of spring stiffness 60N/mm supports vertically a load of 3kN at the free end. The motion is resisted by the oil dashpot. It is found that the amplitude at the beginning of the fourth cycle is 0.6 times the amplitude of the previous vibration. Find the ratio of the frequencies of damped and un damped vibrations.	12 Marks	L3	CO6	PO1 PO2 PO3 PO4 PO5 PO6

❀ ❀ ❀

CODE No.: 19BT40302 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations July - 2022

ENGINEERING METROLOGY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Distinguish between Material standard and wavelength standard.	6 Marks	L2	CO1	PO1
	b)	Explain the method of Calibration of the slip gauges.	6 Marks	L3	CO1	PO1
		(OR)				
2.	a)	Explain hole basis and shaft basis system.	6 Marks	L2	CO1	PO1
	b)	Determine the tolerance on the hole and the shaft for a precision limiting fit designated by 50 H7 g6. 50 mm lies between the range of 30-50mm Standard tolerance unit (i)= $0.45\ 3\sqrt{D} + 0.001D$ microns, Fundamental deviation of g shaft = -2.5 d 0.34 . Evaluate the maximum and minimum dimensions of shaft and hole and clearances.	6 Marks	L3	CO1	PO3

UNIT-II

3.	a)	Sketch and explain the Taylors principle of limit gauging.	6 Marks	L2	CO2	PO1
	b)	Explain Sigma comparator with neat sketch.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Explain the principle, working and use of spirit level.	6 Marks	L3	CO2	PO1
	b)	What is the working principle of a bevel protractor? What are the precautions to be taken while using it?	6 Marks	L2	CO2	PO1

UNIT-III

5.	a)	Explain the measurement methodology involved in the use of optical flats.	6 Marks	L3	CO3	PO1
	b)	Classify straight edges with illustrations.	6 Marks	L2	CO3	PO2
		(OR)				
6.	a)	With the help of a neat sketch, explain the Taylor–Hobson talysurf.	6 Marks	L2	CO3	PO1
	b)	Write the principle and working of Auto collimator with a neat sketch.	6 Marks	L3	CO3	PO1

UNIT-IV

7.	a)	Using 2 wire measure the effective diameter of a screw thread with neat sketch.	6 Marks	L3	CO4	PO2
	b)	With the help of a sketch, explain the construction and working of a bench micrometer.	6 Marks	L2	CO4	PO1
		(OR)				
8.	a)	Demonstrate the method used for checking pitch of the gear.	6 Marks	L3	CO4	PO1
	b)	Explain the method to find the tooth thickness of the gear.	6 Marks	L2	CO4	PO1

UNIT-V

9.	a)	What are rosette gauges? Explain briefly.	6 Marks	L2	CO5	PO1
	b)	Explain the method of usage of resistance strain gauge for bending strains.	6 Marks	L2	CO5	PO1
		(OR)				
10.	a)	Explain Seebeck, Thomson and Peltier effects.	6 Marks	L2	CO5	PO1
	b)	Explain digital thermometers with a neat sketch.	6 Marks	L2	CO5	PO1

❀ ❀ ❀

CODE No.: 19BT40303 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations July – 2022

FLUID MECHANICS AND HYDRAULIC MACHINERY

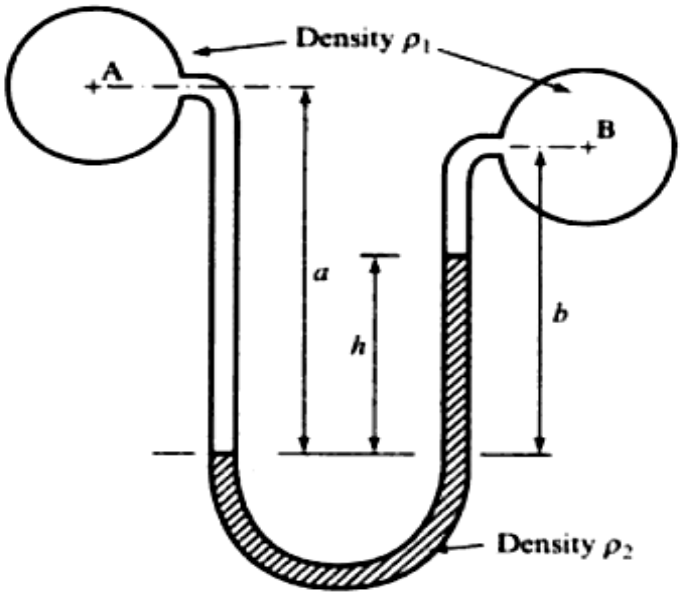
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain about different types of fluids with the help of shear stress and velocity gradient diagram.	6 Marks	L1	CO1	PO1
	b)	One Litre of crude oil weighs 9.6 N. Calculate its specific weight, density and specific gravity.	6 Marks	L3	CO1	PO1 PO2
		(OR)				
2.		A U-tube manometer measures pressure difference between two points A and B in a liquid of density ρ_1. The U-tube contains mercury of density ρ_2. Calculate the difference of pressure, if the liquid at A and B is water and $\rho_2 = 13.6\ \rho_1$ (Use: a = 2 m, b = 1.5 m and h = 0.5 m).	12 Marks	L3	CO1	PO1 PO2



UNIT-II

3.		Derive an expression for continuity equation for three-dimensional incompressible flow in Cartesian coordinates.	12 Marks	L2	CO2	PO1 PO2
		(OR)				
4.		The water is flowing in a pipe of diameter 30cm. The pipe is inclined and a Venturimeter is inserted in the pipe. The diameter of the Venturi at the throat is 15cm. The difference of pressure between inlet and throat of the Venturimeter is measured by a liquid of sp. gr. 0.8 in an inverted U-tube manometer which gives a reading of 40cm. The loss of head between the inlet and throat is 0.3 times the kinetic head of the pipe. Find the discharge of water flowing through the pipe.	12 Marks	L3	CO2	PO1 PO2

UNIT-III

5.		Water flows through a pipe of diameter 300mm with a velocity of 5m/s. If the coefficient of friction is given by $f = 0.015 + 0.08/(Re^{0.3})$ where Re is the Reynolds number, estimate the head lost due to friction for a length of 10m. Take kinematic viscosity of water as 0.01 stoke.	12 Marks	L3	CO3	PO1 PO2
		(OR)				
6.	a)	Explain the terms, hydraulic gradient line and total energy line.	6 Marks	L2	CO3	PO1 PO2
	b)	Determine the rate of flow of water through a pipe of diameter 30cm and length 60m, when one end of the pipe is connected to a tank and the other end is open to the atmosphere. The pipe is horizontal and the height of water in the tank is 5m above the centre of the pipe. Consider minor losses and take f = 0.009.	6 Marks	L3	CO3	PO1 PO2

UNIT-IV

7.		A 50mm diameter jet having a velocity 25 m/s strikes a flat plate, the normal of which is inclined at an angle 30º to the axis of the jet. Calculate the normal force exerted on the plate i) when plate is stationary and ii) when plate is moving with a velocity 10 m/s in the direction of the jet. Also, find the work done and efficiency of the jet when plate is moving.	12 Marks	L3	CO4	PO1 PO2
		(OR)				
8.		Discuss the following terms in detail with their equations as they are applied to hydro-electric power plant based on impulse/reaction turbine: i) gross head, ii) net head, iii) overall efficiency, iv) volumetric efficiency, v) hydraulic efficiency and vi) mechanical efficiency.	12 Marks	L2	CO4	PO1

UNIT-V

9.		Explain the principle and working of a centrifugal pump with neat sketch.	12 Marks	L2	CO5	PO1 PO2
		(OR)				
10.		A double acting reciprocating pump, running at 50 r.p.m. is discharging 900 litres of water per minute. The pump has stroke of 400 mm. The diameter of piston is 250 mm. The delivery and suction head are 25 m and 4 m respectively. Find the slip of the pump and power required to drive the pump.	12 Marks	L3	CO5	PO1 PO2

CODE No.: 19BT40304 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations July – 2022

METAL CUTTING AND MACHINE TOOLS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Define machining and write the principle of machining.	6 Marks	L1	CO1	PO1
	b)	Define cutting parameters with appropriate units.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Differentiate among ASA, ORS and NRS systems.	6 Marks	L2	CO1	PO1
	b)	What are the essential requirements of tool materials?	6 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Differentiate between Orthogonal and Oblique cutting.	6 Marks	L2	CO2	PO1
	b)	Explain the velocity polygon in machining.	6 Marks	L3	CO2	PO1
		(OR)				
4.		In orthogonal cutting of a material the feed force is 80kgf and cutting force is 150kgf. Given the chip thickness ratio as 0.3 and rake angle as 8^0. Calculate: i) Compressive and shear force on shear plane. ii) Coefficient of friction of the chip on the tool face.	12Marks	L4	CO2	PO2
		UNIT-III				
5.	a)	Classify the lathes.	6 Marks	L1	CO3	PO1
	b)	Explain taper turning by tail stock set over method with a neat diagram.	6 Marks	L1	CO3	PO1
		(OR)				
6.	a)	Explain any four tool holding devices.	6 Marks	L1	CO3	PO1
	b)	Describe a single spindle bar automatic lathe in detail.	6 Marks	L1	CO3	PO1
		UNIT-IV				
7.	a)	How slotting machine is specified and write the main parts of a slotting machine?	6 Marks	L1	CO4	PO1
	b)	Compare shaper and planer.	6 Marks	L2	CO4	PO1
		(OR)				
8.	a)	What are the specifications of Drilling machine?	6 Marks	L1	CO4	PO1
	b)	Explain jig boring machine.	6 Marks	L1	CO4	PO1
		UNIT-V				
9.	a)	Write a short note on rotary table type surface grinder.	6 Marks	L1	CO5	PO1
	b)	Explain truing and dressing of grinding wheels.	6 Marks	L1	CO5	PO1
		(OR)				
10.	a)	Classify milling machines.	6 Marks	L1	CO6	PO1
	b)	Write a short note on the following milling operations. i) End milling. ii) Profile milling. iii) Gang milling.	6 Marks	L2	CO6	PO1

CODE No.: 19BT40305 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations July – 2022

THERMAL ENGINEERING-I

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	What is the difference between air standard cycle approximation, fuel-air cycle approximation and real cycle performance?	6 Marks	L1	CO1	PO1
	b)	What type engine is used for the two wheeler (Bajaj Pulsur)? Explain its working in detail.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Describe the different phases of combustion phenomenon in SI engines with suitable sketches.	6 Marks	L1	CO1	PO1
	b)	CI engines will accept the lean mixtures. Justify the statement.	6 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Find the engine dimensions of a 2-cylinder, 2-stroke I.C. engine from the following data: Engine speed= 4000 r.p.m, Volume efficiency = 0.77, Mechanical efficiency = 0.75, Fuel consumption = 10 Lit/hr S = 0.73, Air fuel ratio = 18:1, Page 3 of 3 Piston speed = 100 m/s, Indicated mean effective pressure = 5 bar. Find also brake power. Take R of gas mixture as 281 J/Kg k at S.T.P.	6 Marks	L3	CO1	PO1 PO2 PO3
	b)	Explain procedure to conduct Morse Test in your laboratory.	6 Marks	L1	CO1	PO1
		(OR)				
4.	a)	State the advantages and disadvantages of Methanol as alternative fuel for IC engine.	6 Marks	L1	CO1	PO1
	b)	A four stroke gas engine has a cylinder diameter of 25cm and stroke 45cm. The effective diameter of the brake is 1.6m. The observations made in a test of the engine were as follows: Duration of test = 40 min; Total number of revolutions = 8080; Total number of explosions = 3230; Net load on the brake = 90 kg; Mean effective pressure = 5.8 bar; Volume of gas used = 7.5m^3; Pressure of gas indicated in meter = 136mm; Water of gauge Atmospheric temperature = 170C; Page 3 of 3; Calorific value of gas = 19 MJ/m^3 at NTP Rise in temperature of jacket cooling water = 450C; Cooling water supplied = 180 kg. Draw up a heat balance sheet and estimate the indicated thermal efficiency and brake thermal efficiency. Assume atmospheric pressure as 760mm of Hg.	6 Marks	L3	CO1	PO1 PO2 PO3
		UNIT-III				
5.	a)	In a constant pressure open cycle gas turbine air enters at 1 bar and 20^{0}C and leaves the compressor at 5 bar. Using the following data: temperature of the gases entering the turbine = 680^{0}C, pressure loss in the combustion chamber = 0.1 bar, $\eta_{compressor}$ = 85%, $\eta_{turbine}$ = 80%, $\eta_{combustion}$ = 85%, γ =1.4, C_p=1.024kJ/kg K for air and gas. Find: i) The quality of air circulation if the plant develops 1065kW. ii) Heat supplied per kg of circulation. iii) Thermal efficiency of the cycle. Mass of fuel may be neglected.	6 Marks	L3	CO2	PO1 PO2 PO3
	b)	Discuss the differences between open cycle and closed cycle gas	6 Marks	L1	CO2	PO1

turbines.

(OR)

6.	a)	Explain the principle of operation of a turbojet engine and state its advantages and disadvantages.	6 Marks	L1	CO2	PO1
	b)	What are the types of rocket engines?	6 Marks	L1	CO2	PO1

UNIT-IV

7.	a)	In an axial flow compressor, the overall stagnation pressure ratio achieved is 4 with overall stagnation isentropic efficiency 85%. The inlet stagnation pressure and temperature are 1 bar and 300K. The mean blade speed is 180m/s. The degree of reaction is 0.5 at the mean radius with relative air angles of 120 and 320 at the rotor inlet and outlet respectively. The work done factor is 0.9. Calculate: i) Stagnation polytropic efficiency. ii) Number of stages. iii) Inlet temperature and pressure. iv) Blade height in the first stage if the hub-tip ratio is 0.42, mass flow rate 19.5 kg/s.	6 Marks	L3	CO3	PO1 PO2 PO3
	b)	Compare the centrifugal and axial flow compressors.	6 Marks	L2	CO3	PO1

(OR)

8.	a)	Explain in detail about saving of work in reciprocating compressors.	6 Marks	L1	CO3	PO1
	b)	A centrifugal compressor receives air at the rate of 1400m 3/min at 100 kPa and 350 C and delivers at 350 kPa. It has an isentropic efficiency of 82%. Mechanical losses amount to 2.5% of the shaft power. Determine the power required and exit air temperature.	6 Marks	L3	CO3	PO1 PO2 PO3

UNIT-V

9.	a)	Thermodynamically analyze Rankine cycle.	6 Marks	L1	CO4	PO1
	b)	Analyze the effect of operating conditions on Rankine cycle efficiency.	6 Marks	L1	CO4	PO1

(OR)

10.	a)	Explain the concept of mean temperature of heat addition in Rankine cycle.	6 Marks	L1	CO4	PO1
	b)	How the efficiency and work done of the rankine cycle changes with Regeneration.	6 Marks	L1	CO4	PO1

CODE No.: 19BT40401 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations July - 2022

ANALOG COMMUNICATIONS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Obtain a relationship between carrier and side band powers in an SSBSC wave and explain how power distribution takes place in SSB SC system.	6 Marks	L2	CO1	PO2
	b)	The peak amplitude of an amplitude modulated signal varies from 2V to 10V. Determine the modulation index, carrier power and sideband power.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Derive an expression for AM wave and sketch its frequency spectrum.	6 Marks	L2	CO1	PO1
	b)	A carrier signal $c(t)= 10\cos[2\pi 10^6 t]$ is modulated by a message signal having spectral components 5KHz, 10KHz and 20KHz. The corresponding modulation indexes (μ) are 0.4, 0.5 and 0.6 respectively. Sketch the spectrum and determine bandwidth and power of the signal.	6 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Define angle modulation and illustrate the frequency spectrum of narrow band FM with neat diagram.	6 Marks	L1	CO1	PO2
	b)	An FM signal is represented in time domain as $s(t)=10\cos[2\pi 10^6 t+5\sin 8\pi 10^3 t]$. Determine the modulation index, power and band width.	6 Marks	L2	CO1	PO2
		(OR)				
4.	a)	Illustrate the working principal of PLL demodulator with neat diagram.	6 Marks	L2	CO1	PO2
	b)	A 100 MHz carrier is frequency modulated by a sinusoidal signal of amplitude of 20V and frequency of 100KHz. The frequency sensitivity of the modulator is 25KHz. Determine the modulation index and bandwidth of the signal.	6 Marks	L2	CO1	PO2

UNIT-III

5.	a)	Interpret the figure of merit (FOM) of AM, DSBSC, SSC and VSB.	6 Marks	L2	CO2	PO2
	b)	Derive the expression of S/N for coherent AM receiver.	6 Marks	L3	CO2	PO2
		(OR)				
6.	a)	Define white noise and explain its effect when it passes through a band pass filter.	6 Marks	L3	CO2	PO2
	b)	Derive the value of FOM of SSB receiver.	6 Marks	L3	CO2	PO1

UNIT-IV

7.	a)	Draw the block diagram of Super heterodyne receiver and Explain the function of each block in detail.	6 Marks	L2	CO3	PO2
	b)	A Super heterodyne receiver having no RF amplifier and tuned to 1000KHz. The intermediate frequency is 455KHz. The Q value of the tuned circuit is 100. Determine the image frequency and image rejection ratio.	6 Marks	L2	CO3	PO2
		(OR)				
8.	a)	List out the different Classification of Transmitters and explain any one type in detail.	6 Marks	L1	CO3	PO1
	b)	Explain automatic gain control (AGC). What are merits of delayed AGC over simple AGC?	6 Marks	L2	CO3	PO2

UNIT-V

9.	a)	Interpret how a Pulse Position Modulation (PPM) signal can be generated from Pulse Width Modulation (PWM) signal along with circuit diagram.	6 Marks	L3	CO4	PO2
	b)	Illustrate the working principle of Time Division Multiplexing with neat diagram.	6 Marks	L2	CO4	PO2
		(OR)				
10.	a)	Describe the synchronization procedure for PAM, PWM and PPM signals in detail.	6 Marks	L2	CO4	PO2
	b)	Illustrate the generation of PPM signals, with a neat circuit diagram and wave forms.	6 Marks	L2	CO4	PO2

CODE No.: 19BT40402 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations July – 2022

ELECTRONIC CIRCUIT ANALYSIS AND DESIGN

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the need for cascading.	4 Marks	L2	CO1	PO1
	b)	Design RC coupled amplifier and explain the frequency response of it.	8 Marks	L3	CO4	PO1
		(OR)				
2.	a)	Develop the expressions for input impedance, output impedance and voltage gain of common drain MOSFET amplifier.	8 Marks	L4	CO1	PO3
	b)	Explain about different coupling schemes used in amplifiers.	4 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	Determine high-frequency parameters in terms of low-frequency parameters.	6 Marks	L2	CO2	PO1
	b)	At I_C=1mA and V_{CE}=10V, a certain transistor data shows Cc=$C_{b'c}$=3pF, h_{fe}=200 and ω_T=500M rad/sec. Calculate g_m, $r_{b'e}$, C_e=$C_{b'e}$ and ω_β.	6 Marks	L3	CO2	PO2
		(OR)				
4.	a)	Derive an expression for gain bandwidth product for voltage and current of a single stage common emitter amplifier. (Use approximate analysis).	6 Marks	L3	CO2	PO3
	b)	A single stage CE amplifier has upper 3dB frequency of voltage gain, f_H=4MHz with a load resistance R_L=600Ω. If the transistor parameters are g_m=50mA/V, h_{fe}=100, $r_{bb'}$=100Ω, C_c=3pF and f_T=300MHz, calculate the value of source resistance which will result in the required value of f_H and the midband gain with above value of R_s.	6 Marks	L4	CO2	PO2
		UNIT-III				
5.	a)	Discuss the characteristics and advantages of negative feedback amplifier.	6 Marks	L4	CO3	PO1
	b)	With a neat block diagram, explain current series feedback amplifier.	6 Marks	L2	CO3	PO1
		(OR)				
6.	a)	With necessary diagram, explain different feedback configurations.	8 Marks	L2	CO3	PO1
	b)	An amplifier has gain A=1000 and bandwidth of 200kHz. Calculate the gain and bandwidth with feedback if feedback factor β=20%.	4 Marks	L3	CO3	PO2
		UNIT-IV				
7.	a)	Classify oscillators based on different considerations.	4 Marks	L2	CO4	PO1
	b)	Explain the working principle of Wien Bridge Oscillator and derive the expression for frequency of oscillation.	8 Marks	L3	CO3	PO2

(OR)

8.	a)	Draw the circuit diagram and derive the expression for the frequency of oscillation and condition for sustained oscillations of Colpitts oscillator.	6 Marks	L3	CO3	PO2
	b)	In a Hartley oscillator, L_1=20μH, L_2=2mH and C is variable. Find the range of C if frequency is to be varied from 1MHz to 2.5MHz. Neglect mutual inductance.	6 Marks	L4	CO3	PO2

UNIT-V

9.	a)	Discuss the classification of power amplifiers.	6 Marks	L2	CO3	PO1
	b)	Derive the expression for efficiency of class C power amplifier.	6 Marks	L3	CO4	PO2

(OR)

10.	a)	With neat sketches, explain transformer coupled power amplifier.	8 Marks	L3	CO4	PO1
	b)	Compare push pull and complementary symmetry Class B amplifier.	4 Marks	L2	CO4	PO2

CODE No.: 19BT40403 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations July - 2022

LINEAR AND DIGITAL IC APPLICATIONS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Draw the IC 741 op-amp pin diagram and explain the function of each pin in detail.	6 Marks	L2	CO1	PO1
	b)	Draw the circuit diagram of a practical log amplifier and obtain an expression for its output voltage.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Design monostable multivibrator using 555 timer to produce a pulse width of 200 m sec.	6 Marks	L3	CO1	PO4
	b)	Design a symmetrical square wave generator with 3KHz frequency and 5V peak value using 555 timer IC. Assume necessary data.	6 Marks	L3	CO1	PO3
		UNIT-II				
3.	a)	Explain in detail with a neat circuit diagram the operation of 3-bit parallel ADC.	6 Marks	L2	CO3	PO2
	b)	List out the merits and demerits of Dual slope and flash type A-D converters.	6 Marks	L4	CO3	PO1
		(OR)				
4.	a)	Draw a circuit for first order high pass filter and also derive an expression for lower cut off frequency.	6 Marks	L2	CO2	PO2
	b)	Design a second order butter worth low pass filter having an upper cut off frequency of 4 KHz.	6 Marks	L3	CO2	PO4
		UNIT-III				
5.	a)	Write a Gate level hierarchical program for 4 bit full adder.	6 Marks	L4	CO4	PO2
	b)	Describe the following terms in the language of Verilog. i) Service primitives. ii) Subroutines.	6 Marks	L2	CO4	PO1
		(OR)				
6.	a)	Write a data flow description for 2 to 4 line encoder.	6 Marks	L4	CO4	PO2
	b)	List out the differences between VHDL and Verilog.	6 Marks	L4	CO4	PO1
		UNIT-IV				
7.	a)	Draw and explain the block diagram of n-bit parallel binary adder/subtractor.	6 Marks	L2	CO5	PO1
	b)	Explain about Comparator and design a 8-bit comparator using 74 x 85. Write Verilog program.	6 Marks	L3	CO5	PO2
		(OR)				
8.	a)	Implement the 16 input to 4 output priority encoder using 74 x 148.	6 Marks	L3	CO5	PO3
	b)	Design 16 x 1 multiplexer using 4 x 1 multiplexer.	6 Marks	L3	CO5	PO3
		UNIT-V				
9.	a)	Design a synchronous counter using 74XX ICs and explain its working with neat timing waveforms.	6 Marks	L3	CO5	PO3
	b)	Design and Implement universal shift register using 74 x 194 IC.	6 Marks	L3	CO5	PO3
		(OR)				
10.	a)	Design and Implement up/down counter using 74 x 169 IC.	6 Marks	L3	CO5	PO3
	b)	Design and Implement Excess 3 decimal Counter using 74 x 163 IC.	6 Marks	L3	CO5	PO3

CODE No.: 19BT40404 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations July – 2022

PROBABILITY AND STOCHASTIC PROCESSES

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define the terms outcome, event, sample space, mutually exclusive events. Consider the experiment of rolling of two fair dice simultaneously and represent its sample space. Also give examples of terms mentioned above related to this experiment	6 Marks	L2	CO1	PO1
	b)	A box of 30 diodes is known to contain 5 defective ones. If two diodes are slaved at random without replacement, what is the probability that at least one of these diodes is defective?	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Discuss about Total Probability and Baye's theorem with detailed explanation	6 Marks	L2	CO1	PO1
	b)	Letter is known to have come either from LONDON or CLIFTON. On the post card only two consecutive letters as 'ON' are legible what is the chance that it came from LONDON.	6 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Sketch the Distribution and density function and also mention the applications of Uniform Distribution.	6 Marks	L3	CO2	PO1
	b)	Find a constant b>0 so that the function.	6 Marks	L2	CO2	PO2

$$f_X(x) = \frac{1}{10} e^{3x,} \quad 0 \le x \le b$$

$$= 0, \quad elsewhere$$

is a valid PDF.

(OR)

4.	a)	Explain the Rayleigh distribution and density functions.	6 Marks	L2	CO2	PO1
	b)	A random variable has pdf.	6 Marks	L3	CO2	PO2

$$f_X(x) = \frac{5}{4}\left(1 - x^4\right) \quad 0 \le x \le 1$$

$$= 0, \quad elsewhere$$

Find E [4x+2] and E[x^2]

UNIT-III

5.	a)	Distinguish between the Joint probability and conditional probability. Give an example each.	6 Marks	L2	CO2	PO1
	b)	Two Random Variables X and Y have a joint probability density function.	6 Marks	L3	CO2	PO2

$$f_{XY}(x,y) = \begin{cases} \frac{5}{16} x^2 y & 0 < y < x < 2 \\ 0 & elsewhere \end{cases}$$

i) Find the Marginal density function of X and Y.
ii) Are X and Y statistically independent

(OR)

6.	a)	Given the transformation y = cos x where x be a uniformly distributed random variable in the interval $(-\pi, \pi)$. Find $f_y(y)$ and E[y].	6 Marks	L3	CO2	PO2
	b)	Two statistically independent random variables X and Y have mean values E[X] = 2 and E[Y] = 4. They have second moments $E[X^2] = 8$ and $E[Y^2] = 25$. Find Variance of W = 3X-Y.	6 Marks	L3	CO2	PO2

UNIT-IV

7.	a)	Define and explain stationarity of a random process X(t) and its types.	6 Marks	L2	CO3	PO1
	b)	Consider a random process X(t)=Cos(wt+ θ) where 'w' is real constant and θ is a uniform variable in $(0, \pi/2)$. Show that X(t) is not a WSS process. Also find the average power in the process.	6 Marks	L2	CO3	PO2

(OR)

8.	a)	Define power density spectrum and explain its properties.	6 Marks	L2	CO3	PO1
	b)	Given a cross power spectrum given by $S_{XX}(\omega) = \frac{8}{(a + j\omega)^3}$ *where* $a > 0$ is a constant. Find the cross correlation function	6 Marks	L3	CO3	PO2

UNIT-V

9.	a)	Give the Noise classification. Explain any three types of noises.	6 Marks	L2	CO4	PO1
	b)	For an amplifier operating at a temperature of 20^0 centigrade with a bandwidth of 10 kHz, determine the thermal noise in dB. If the load resistance is 220Ω, calculate the r.m.s voltage	6 Marks	L2	CO4	PO2

(OR)

10.	a)	Explain the terms: Noise Factor, Noise Figure and Equivalent Noise Temperature.	6 Marks	L2	CO4	PO1
	b)	If white noise with power density 6×10^{-3}W/Hz is applied to the input, find the noise power in the system's output.	6 Marks	L3	CO4	PO2

CODE No.: 19BT40441 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations July - 2022

ANALOG ELECTRONICS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss briefly Cascode amplifier.	6 Marks	L1	CO1	PO6
	b)	Derive the expression for voltage gain of a two-stage RC coupled CE amplifier at mid frequency range.	6 Marks	L2	CO1	PO4
		(OR)				
2.	a)	Explain the different coupling schemes used in amplifiers.	6 Marks	L1	CO1	PO6
	b)	Discuss different parameters in Hybrid-Pi (π)-Common Emitter model.	6 Marks	L2	CO1	PO2

UNIT-II

3.	a)	What is the concept of negative feedback and draw the schematic diagrams of four basic negative feedback configurations?	6 Marks	L2	CO2	PO3
	b)	An amplifier has a midband gain of 125 and a bandwidth of 250KHz. If 4% negative feedback is introduced, find the new bandwidth and gain.	6 Marks	L3	CO2	PO1
		(OR)				
4.	a)	What are the advantages and disadvantages of the introduction of negative feedback in amplifiers? Explain.	6 Marks	L2	CO2	PO4
	b)	A voltage series negative feedback amplifier has a voltage gain without feedback of A=500, input resistance R_i = 3 kΩ, output resistance R_o = 20 kΩ and feedback ratio β = 0.01. Calculate the voltage gain Af, input resistance Rif and output resistance Rof of the amplifier with feedback.	6 Marks	L3	CO2	PO1

UNIT-III

5.	a)	What are the factors that affect the frequency stability of an oscillator? How frequency stability can be improved in oscillators?	6 Marks	L2	CO2	PO5
	b)	Draw the circuit diagram of Colpitt's Oscillator and explain its principle of operation.	6 Marks	L2	CO2	PO3
		(OR)				
6.	a)	Explain the principle of operation of the wein bridge oscillator.	6 Marks	L2	CO2	PO4
	b)	In a Colpitts oscillator, if C_1=0.2μF, C_2=0.02μF. If the frequency of oscillator is 10kHz, find the value of the inductor. Also find the required gain for oscillations.	6 Marks	L3	CO2	PO2

UNIT-IV

7.	a)	What is harmonics distortion in power amplifier? Discuss the operation of a class B power amplifier and derive its maximum power conversion efficiency.	6 Marks	L2	CO3	PO2
	b)	The loudspeaker of 8Ω is connected to the secondary of the output transformer of a class A amplifier circuit. The quiescent collector current is 140mA the turns ratio of the transformer is 3:1. The collector supply voltage is 10V. If a.c power delivered to the loudspeaker is 0.48W, assuming ideal transformer, calculate i) A.C power delivered across primary ii) RMS value of load voltage iii) RMS value of primary voltage iv) RMS value of	6 Marks	L3	CO3	PO1

load current v) RMS value of primary current vi) efficiency.

(OR)

8.	a)	What is a power amplifier and are classify them based on class of operation and also compare them.	6 Marks	L1	CO3	PO4
	b)	A class B, push-pull amplifier drives a load of 16Ω, connected to the secondary of the ideal transformer. The supply voltage is 25V. If turns ratio is 200**:**50, Calculate maximum power output, DC power input and efficiency.	6 Marks	L3	CO3	PO3

UNIT-V

9.	a)	With the help of internal circuit diagram, of IC555 explain the operation of a monostable multivibator.	6 Marks	L1	CO4	PO6
	b)	Design a second-order low-pass filter to give a high cut off frequency 1 kHz, a pass band gain of 4.	6 Marks	L3	CO4	PO1

(OR)

10.	a)	Explain the operation of 2nd order high-pass filter along with circuit diagram.	6 Marks	L2	CO4	PO2
	b)	Design an astable multivibrator using 555 timer to generate an output signal with frequency 5kHz and 50% duty cycle.	6 Marks	L3	CO4	PO3

❀ ❀ ❀

CODE No.: 19BT40501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations July - 2022

COMPUTER NETWORKS

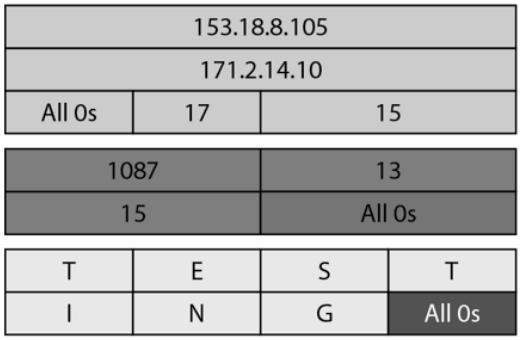
[Computer Science and Engineering, Information Technology]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		OSI is a layered architecture. List out network support layers and user support layers among the 7 layers in OSI model and explain each layers functionality in detail.	12 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Explain in detail the hardware and network peripherals used in computer networks.	6 Marks	L2	CO1	PO1
	b)	What is the significance of twisting in twisted pair cable? What are the different categories of a twisted pair cables and their features?	6 Marks	L3	CO1	PO1
		UNIT-II				
3.	a)	Explain the selective repeat Sliding Window Protocol with an example.	6 Marks	L4	CO3	PO2
	b)	Compare one dimensional and two-dimensional parity checking with examples.	6 Marks	L4	CO1	PO2
		(OR)				
4.	a)	Define error correction and explain the techniques used to correct the errors.	6 Marks	L2	CO1	PO1
	b)	Write the Procedures to translate the IPV4 to IPV6 with reference to header structure.	6 Marks	L4	CO3	PO4
		UNIT-III				
5.	a)	Take a simple graph and analyze the behavior of Distance Vector Routing algorithm. How it suffers with count to infinity problem, how it can be avoided.	6 Marks	L4	CO3	PO2
	b)	Explain the concept of hierarchical routing.	6 Marks	L2	CO5	PO8
		(OR)				
6.	a)	Explain and Infer the Working Principle and Packet format of IPv4.	6 Marks	L4	CO2	PO2
	b)	With neat sketch, explain how Leaky bucket and Token bucket algorithms improve the Quality Of Service.	6 Marks	L3	CO1	PO1
		UNIT-IV				
7.	a)	At Transport layer we use three-way handshaking procedure for connection establishment and connection release. Why 2-way handshaking is not used.	6 Marks	L4	CO3	PO2
	b)	Explain the concept of slow start mechanism to control congestion in TCP.	6 Marks	L3	CO3	PO1
		(OR)				

8.		Calculate the checksum for UDP.	12 Marks	L4	CO3	PO4



UNIT-V

9.		Find the class of each IP address. Give suitable explanation. i) 227.12.14.87 ii) 193.14.56.22 iii) 14.23.120.8 iv) 252.5.15.111 v) 134.11.78.56 vi) 172.18.58.1 vii) 00000000111100001111111100110011 viii) 10000000111100001111111100110011	12 Marks	L3	CO4	PO6

(OR)

10.	a)	Explain the concept of DNS.	6 Marks	L3	CO4	PO6
	b)	Describe the usage of FTP protocol in client-server model and explain FTP data structures.	6 Marks	L2	CO4	PO6

CODE No.: 19BT41501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations July - 2022

THEORY OF COMPUTATION

[Information Technology]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the following: i) NFA. ii) Extended transition function. iii) Language of NFA.	6 Marks	L2	CO1	PO2
	b)	Prove that a language L is accepted by some DFA if and only if L is accepted by some NFA.	6 Marks	L4	CO2	PO3
		(OR)				
2.	a)	Design a DFA which does not accept set of all strings containing three consecutive zeros.	6 Marks	L3	CO1	PO2
	b)	Consider the following Є-NFA.	6 Marks	L3	CO2	PO2

δ	Є	a	b
→p	{r}	{q}	{p, r}
q	Φ	{p}	Φ
*r	{p, q}	{r}	{p}

i) Compute the □-closure of each state.
ii) Give the set of all strings of length 3 or less accepted by the automaton.
iii) Convert the automaton to a DFA.

UNIT-II

3.	a)	Write regular expressions for the following languages. i) All strings over {0, 1} that do not contain 1101. ii) All strings over {0, 1} that contain 1011. iii) All strings over {a, b} that contain at least 2 a's.	6 Marks	L3	CO2	PO1
	b)	Prove that the set {0n1m / n ≤ m} is not regular language.	6 Marks	L4	CO2	PO2
		(OR)				
4.	a)	Prove that the following regular expressions are equivalent. $L_1 = 1*(011)*(1*(011)*)*$, $L_2 = (1+011)*$	6 Marks	L4	CO2	PO2
	b)	Construct the minimum state equivalent DFA to the DFA given by the following transition table.	6 Marks	L4	CO2	PO2

δ	0	1
→q_1	q_2	q_3
q_2	q_3	q_5
*q_3	q_4	q_3
q_4	q_3	q_5
*q_5	q_2	q_5

UNIT-III

5.		Convert the following CFG into GNF. S→ AB/BC A→ aB/bA/a B→ bB/cC/b C→ c	12 Marks	L4	CO3	PO5

(OR)

6.		Construct the string 0110001 from the grammar S→ AB A→ 0A/1B/0 B→ 1A/0B/1 by using: i) Leftmost derivation. ii) Rightmost derivation.	12 Marks	L4	CO3	PO3

UNIT-IV

7.	a)	Construct a PDA that accepts the language L = $\{a^{2n}b^{n} / n > 0\}$.	6 Marks	L4	CO4	PO2
	b)	Construct a PDA that accepts L = (a, b)* with equal number of a's and b's by the empty stack and final state.	6 Marks	L4	CO4	PO2

(OR)

8.	a)	Construct a PDA that accepts the language generated by the grammar S→asbb/a.	6 Marks	L4	CO4	PO2
	b)	Explain the following PDA acceptance methods. i) From empty stack to final state. ii) From final state to empty stack.	6 Marks	L2	CO4	PO2

UNIT-V

9.	a)	Design a Turing machine for the language L = $\{ a^{n}b^{2n} / n \geq 1\}$.	8 Marks	L3	CO5	PO3
	b)	Explain the representation of Turing machine	4 Marks	L2	CO5	PO3

(OR)

10.	a)	Design a Turing machine for L = $\{0^{n}1^{m}0^{n}1^{m} / n, m \geq 1\}$	8 Marks	L3	CO5	PO3
	b)	Explain briefly undesirability problems about TM.	4 Marks	L2	CO5	PO3

CODE No.: 19BT50201 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations July - 2022

CONTROL SYSTEMS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Derive an expression for the transfer function of an armature controlled DC motor.	6 Marks	L3	CO1	PO1
	b)	Determine the transfer function $\frac{C(s)}{R(s)}$ of the following block diagram using reduction techniques.	6 Marks	L3	CO1	PO5

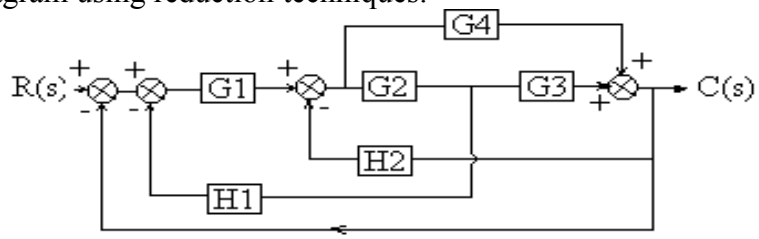


Fig.(1)

(OR)

2.		Determine the transfer function $\frac{X_1(s)}{F(s)}$ for the mechanical system shown in figure and also draw the electrical equivalent network using Force-Current analogy.	12 Marks	L3	CO1	PO2

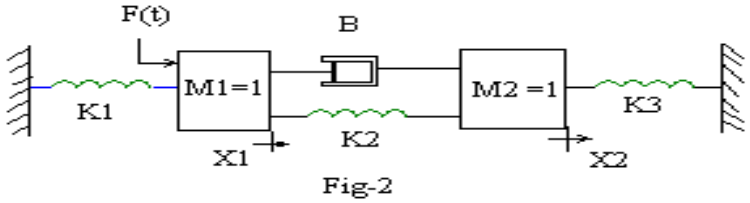
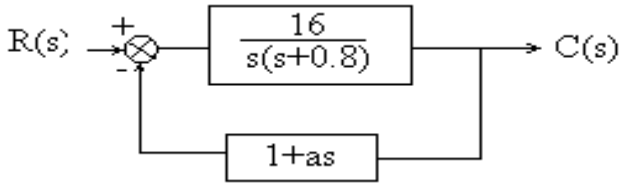


Fig-2

UNIT-II

3.	a)	For the system shown in figure, find the value of "a" such that the damping ratio is 0.5. Determine the rise time, peak time, % of Peak over shoot and settling time in the unit step response	6 Marks	L2	CO2	PO1



	b)	For a system with $G(S)H(S) = \frac{K}{S^2(S+2)(S+3)}$, find the value of K to limit steady state error to 10 when input to system is $1+10t+20t^2$	6 Marks	L4	CO2	PO2

(OR)

4.	a)	What is a PID controller and justify how does it improves the dynamic performance of a control system?	4 Marks	L2	CO2	PO7
	b)	The open-loop transfer function of unity feedback system is $G(S) = \frac{100}{S(S+5)}$. Determine the nature of the closed-loop system for a unit-step input. Also determine rise time, peak time and peak overshoot.	8 Marks	L3	CO2	PO2

UNIT-III

5.	a)	Determine the stability of the system represented by the following characteristic equation using RH criterion. $S^6 + S^5 - 2S^4 - 3S^3 - 7S^2 - 4S - 4 = 0$. If it is unstable find the number of roots of the characteristic equation in the RHS plane	6 Marks	L3	CO3	PO4
	b)	Sketch the root locus for unity feedback system whose open loop transfer function is given below. $$G(s) = \frac{K}{s(s+3)(s+10)}$$	6 Marks	L4	CO3	PO4

(OR)

6.		Find the Gain Margin, Phase Margin and hence closed loop system stability using Bode plot for the given OLTF $G(s)H(s) = \frac{20(1+5s)}{s(1+0.5s)(1+0.05s)(1+50s)}$.	12 Marks	L3	CO3	PO4

UNIT-IV

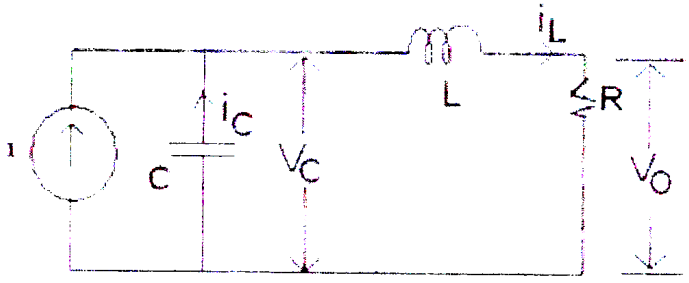
7.	a)	What is compensation? What are the different types of compensators?	6 Marks	L3	CO4	PO3
	b)	What is lead compensator? Obtain the transfer function of lead compensator and draw the pole-zero plot.	6 Marks	L3	CO4	PO3

(OR)

8.		Design a lead-lag controller for the unity feedback system given $G(S) = \frac{5}{S(S+20)}$ to have a settling time of 0.04s and overshoot of 5% for a step input, and a steady state error of 0.001 for unit ramp input.	12 Marks	L4	CO4	PO3

UNIT-V

9.	a)	Obtain the state space representation of the electrical system shown in figure:	6 Marks	L3	CO5	PO2



	b)	Find the state space representation for the given transfer function $\frac{Y(s)}{U(s)} = \frac{6}{s^3 + 9s^2 + 26s + 24}$	6 Marks	L3	CO5	PO2

(OR)

10.	a)	Find the transfer function for a system represented by state model. $\dot{X} = \begin{bmatrix} -5 & 0 \\ -3 & -1 \end{bmatrix} X(t) + \begin{bmatrix} 1 \\ 1 \end{bmatrix} u(t) \;\&\; y(t) = \begin{bmatrix} 1 & 2 \end{bmatrix} x(t)$	6 Marks	L4	CO5	PO2
	b)	Check the controllability for the system described as. $\dot{X} = X(t)\begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0 & -2 & -3 \end{bmatrix} X(t) + \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix} u(t) \quad and \quad y(t) = \begin{bmatrix} 3 & 4 & 1 \end{bmatrix} x(t)$	6 Marks	L3	CO5	PO2

CODE No.:14BT50101 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations August – 2021

STRUCTURAL ANALYSIS - II
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

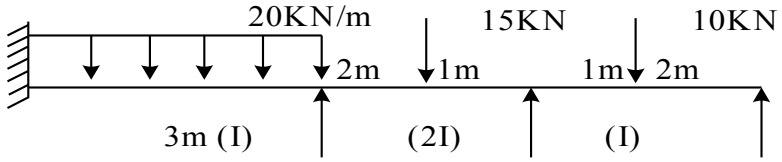
1 Two point load of 150kN and 250kN spaced 3m apart cross a girder of span 15m from left toright with 150kN load leading. Find the values of maximum positive and negative shear force and bending moment at a section D, 6m from left hand support. Also find the absolute maximum bending moment due to given load system. 14 Marks

(OR)

2 Draw the ILD for shear force and bending moment for a section at 5m from the left hand support of a simply supported beam, 20m long in which a UDL rolling load of length 6m and intensity 12 kN/m traverses. Also find the absolute maximum bending moment due to given load system. 14 Marks

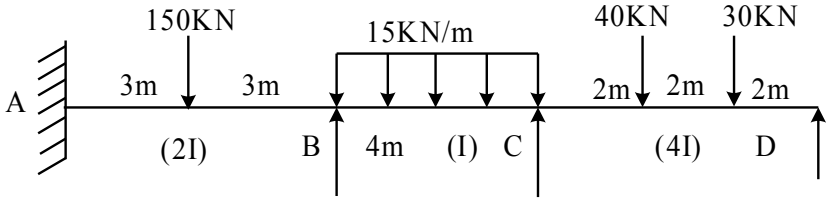
UNIT-II

3 Analyse following continuous beam by slope deflection method and sketch the BMD. 14 Marks



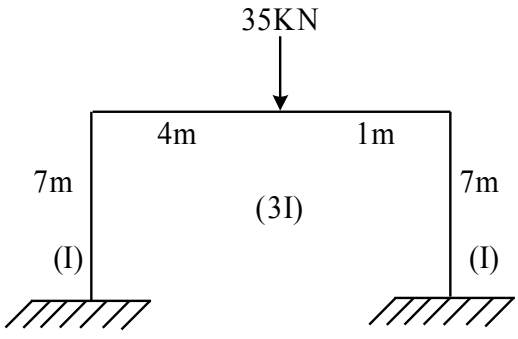
(OR)

4 Analyse the continuous beam shown in figure using moment distribution method of analysis and Sketch the SFD and BMD. Given AB=CD=6m and BC=4m. 14 Marks



UNIT-III

5 Analyse the Portal frame shown in figure by Kani'smethod and sketch the BMD. 14 Marks



(OR)

6 a) Derive the strain energy in linear elastic systems for flexural loading. 7 Marks

b) Calculate the slope at ends of a simply supported beam carrying a UDL **w** per unit length over the whole span. 7 Marks

UNIT-IV

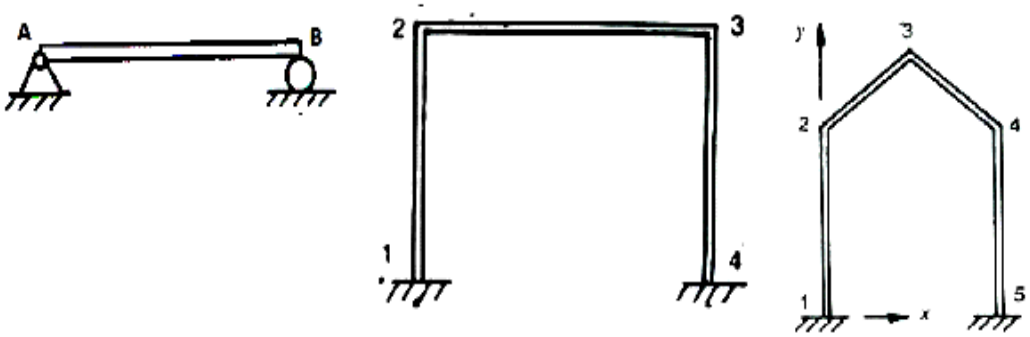
7 What is a Tube structure in tall buildings? Explain the various types of Tube structures in detail using sketches. 14 Marks

(OR)

8 Explain the analysis of a building frame subjected to horizontal forces using Portal method with the help of an example. 14 Marks

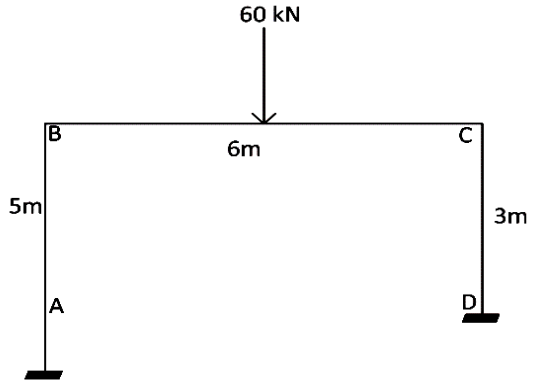
UNIT-V

9 Explain static and kinematic redundancy with examples. Determine static and kinematic redundancy for the following structures. 14 Marks



(OR)

10 Analyze the rigid frame shown in figure by direct stiffness matrix method. 14 Marks



CODE No.:14BT50104 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations August – 2021

SOIL MECHANICS
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Describe the classification of Coarse grained Soils.	6 Marks
	b)	Obtain the relationship between for the water content, void ratio, specific gravity and degree of saturation.	8 Marks

(OR)

2		A sample of clay taken from a natural stratum was found to be partially saturated and when tested in the laboratory gave the following results. Specific gravity of soil particles is 2.6, wet weight of sample is 250g, dry weight of sample is 210g and volume of sample is 150cm^3. Compute the degree of saturation, water content, porosity and void ratio using phase diagram.	14 Marks

UNIT-II

3	a)	What are the properties of the flow nets?	6 Marks
	b)	A falling head permeability test was carried out on a 12.7cm long sample of silty clay. The diameter of the sample and the stand pipe were10cm and 1.0cm respectively. The water level in the stand pipe was observed to fall from 85cm to 55cm in 17minutes. Determine the co-efficient of permeability of the soil and height of water level in the stand pipe after another 17minutes.	8 Marks

(OR)

4		In a deposit of silt, the water table which was at originally at a depth of 1m below ground level was lowered to 3m below ground level. The silt above water table was capillary-saturated. The saturated unit weight of silt was 20kN/m^3. What is the change in effective pressure at a depth of 0.0m, 1.0m and 3.0m?	14 Marks

UNIT-III

5	a)	Distinguish between Boussinesq's and Westergaard's theory of stress distribution in soils.	6 Marks
	b)	An annular ring footing of external and internal radii of 4m and 2m respectively transmits a pressure of 150kN/m^2. Calculate the vertical stress at a depth of 1.0m and 2.0m below the centre.	8 Marks

(OR)

6	a)	Discuss the effect of compaction on properties of soil	6 Marks
	b)	A soil in the borrow pit is at a dry density of 17kN/m^3 with moisture content of 10%. The soil is excavated from this pit and compacted in an embankment to a dry density of 18 kN/m^3 with a moisture content of 15%. Compute the quantity of soil to be excavated from the borrow pit and the amount of water to be added for 100m^3 of compacted soil in the embankment.	8 Marks

UNIT-IV

7	a)	Differentiate between compaction and consolidation.	6 Marks
	b)	What is pre-consolidation pressure and describe the determination of pre-consolidation pressure.	8 Marks

(OR)

8 A Normally consolidated clay layer 2m thick is sandwiched between two sand layers. The average overburden stress at the middle of clay layer can be taken as 60kN/m^2. Due to construction of a structure there is an increase in effective vertical stress of 40 kN/m^2 at the middle of clay layer. The liquid limit of clay layer is 60% and the initial void ratio is 0.7. Estimate the consolidation settlement. 14 Marks

UNIT-V

9 a) Explain the critical void ratio and pore pressure coefficients, in detail. 6 Marks

b) A cylindrical specimen of saturated soil fails under an axial stress 150 kN/m^2 in an unconfined compression test. The failure plane makes an angle of 52^0 with the horizontal. Calculate the cohesion and angle of internal friction of the soil. 8 Marks

(OR)

10 a) Write the merits and demerits of tri-axial shear test over the direct shear test. 6 Marks

b) The following results were obtained from undrained shear box tests on samples of silty clay: 8 Marks

Normal pressure (kN/m^2)	210	315	420
Shear stress (kN/m^2)	115	142	171

Determine the cohesion and angle of shearing resistance.

CODE No.:14BT50201 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations August – 2021

CONTROL SYSTEMS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

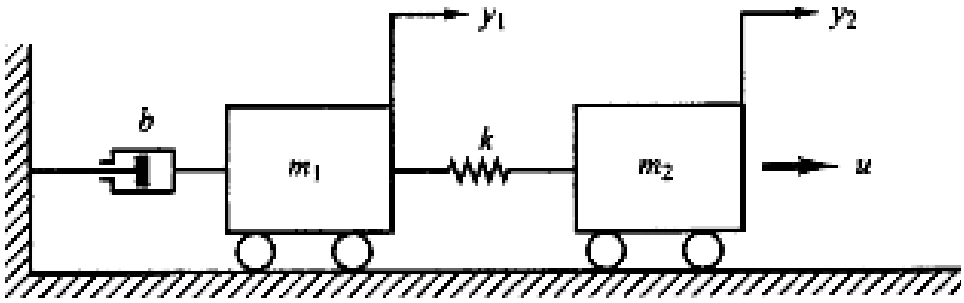
UNIT-I

1 a) What is control system? Explain the components of control system with the help of block diagram. 6 Marks

b) What is block diagram? Explain all the rules used for block diagram reduction method. 8 Marks

(OR)

2 a) Write the differential equations governing the mechanical system shown below. Draw the force Voltage and force current electrical analogous circuits and verify it by using mesh and nodal analysis for the figure shown below and determine its transfer function. 10 Marks



b) Write short notes on synchro transmitter. 4 Marks

UNIT-II

3 a) Obtain the time response for First order system with respect to input test signals 8 Marks

b) Explain about generalized error constants in control systems. 6 Marks

(OR)

4 a) Derive the mathematical expression for delay time, rise time and settling time for the second order system. 7 Marks

b) The overall transfer function of a unity feedback control system is given by $\frac{C(S)}{R(S)} = \frac{10}{S^2 + 6S + 10}$. 7 Marks

Determine the time domain specifications for the given system.

UNIT-III

5 a) Determine the range of values of K for stability of a unity feedback system whose open loop transfer function is $G(s) = \frac{K}{s(s+1)(s+4)}$. 7 Marks

b) Discuss the applications of R-H criterion. 7 Marks

(OR)

6 Draw the complete root locus of the system with $G(s)H(s) = \frac{K(s+0.5)(s+2)}{s(s+1)(s-1)}$, determine the range of K for which system is stable. 14 Marks

UNIT-IV

7 The open loop transfer function of a unity feedback system is given by G(S) = 1/ S(1+S) (1+2S). Sketch the Polar plot and determine the gain margin and phase margin. 14 Marks

(OR)

8 Sketch the Bode plot and hence find Gain cross over frequency, Phase cross over frequency, gain margin and phase margin for the given system, **G(S) = 0.75(1+0.2S)/ S(1+0.5S) (1+0.1S)** 14 Marks

UNIT-V

9 a) Construct state model for the fallowing differential equation **$3y_4+5y_3+6y_2+7y_1+4y_0 = 3u_0$**. 7 Marks

b) Obtain the state variable representation for Armature controlled DC motor. 7 Marks

(OR)

10 a) Derive an expression for the solution of Homogeneous state equations. 7 Marks

b) Determine the State Controllability and Observability of the system using Kalman's test. 7 Marks

$$A = \begin{bmatrix} 0 & 2 & 0 \\ 1 & 2 & 0 \\ -1 & 0 & 1 \end{bmatrix} B = \begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix} C = \begin{bmatrix} 1 & 0 & 1 \end{bmatrix}$$

CODE No.:14BT50301 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations August – 2021

DYNAMICS OF MACHINERY
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) The lengths of crank and connecting rod of a horizontal reciprocating engine are 200mm and 800mm respectively. The crank is rotating at 480 r.p.m. Using Klein's constructions, find the acceleration of the piston. 7 Marks

b) The lengths of crank and connecting rod of a horizontal reciprocating engine are 100mm and 500mm respectively. The crank is rotating at 400 r.p.m. When the crank has turned 30^0 from the inner dead centre, find analytically: 7 Marks

i) Acceleration of the piston. ii) Velocity of the piston.

(OR)

2 a) Explain the procedure to determine the velocity and acceleration of a four-bar mechanism by Klein's construction. 7 Marks

b) What are the Forces on the reciprocating parts of an engine neglecting and considering weight of the connecting rod using Analytical method? 7 Marks

UNIT-II

3 a) Explain the effect of Gyroscopic couple on a Naval ship during pitching. 7 Marks

b) Explain the effect of Gyroscopic couple on Aero plane. 7 Marks

(OR)

4 a) List out the few machines in which flywheel are used. 7 Marks

b) What is the function of a flywheel? How does it differ from that of a governor? 7 Marks
The torque delivered by a two-stroke engine is represented by $t = (1000 + 300 \sin 2\phi - 500 \cos 2\phi)$ N.m, where ϕ is the angle turned by the crank from the inner-dead centre. The engine speed is 250 r.p.m. The mass of the flywheel is 400 kg and radius of gyration is 400 mm. Determine:
(i) The power developed. (ii) The total percentage fluctuation of speed.

UNIT-III

5 With a neat sketch, describe the principle and working of an internal expanding shoe brake. Derive expression for the braking torque 14 Marks

(OR)

6 A multi-plate clutch has three pairs of contact surfaces. The outer and inner radii of the contact surfaces are 150mm and 80mm respectively. The maximum axial spring force is limited to 3 KN and the co-efficient of friction is 0.3. Assuming uniform wear, find the power transmitted by the clutch at 1500 r.p.m. 14 Marks

UNIT-IV

7 a) What is meant by effort and power of a governor? Find the expressions for the same in a porter governor. 7 Marks

b) The following data relate to a Hartnell governor M = 1.5 kg; a = 100 mm; b= 40 mm; r_1 = 70 mm; r_2 =110 mm; N_1 =260 r.p.m; and N_2= 275 r.p.m. The axis of rotation is 80mm form the fulcrum. Calculate the rate of the spring and the equilibrium speed, when the radius of the balls is 80mm. 7 Marks

(OR)

8	a)	Why is balancing necessary for rotors of high speed engines?	7 Marks
	b)	A circular disc mounted on a shaft carries three attached masses 4 kg, 3kg and 2.5 kg at radial distances 75mm, 85mm and 50mm and at the angular positions of 450, 1350 and 2400 respectively. The angular positions are measured counter-clockwise from the reference line along x-axis. Determine the amount of the counter mass at a radial distance of 75mm required for the static balance.	7 Marks

UNIT-V

9	a)	Explain with sketches the different cases of damped vibrations.	7 Marks
	b)	A cantilever shaft 50mm diameter and 300mm long has a disc of mass 100kg at its free end. The Young's modulus for the shaft material is 200GN/m^2. Determine the frequency of longitudinal and transverse vibration of the shaft.	7 Marks

(OR)

10	a)	What do you understand by 'torsionally equivalent shaft'?	7 Marks
	b)	Describe in detail the method of finding the frequency of torsional vibration of a two rotor system.	7 Marks

CODE No.:14BT50305 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations August – 2021

DESIGN OF MACHINE ELEMENTS-I
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What are the factors to be considered for the selection of materials for the design of machine elements? Discuss.	7 Marks
	b)	What are preferred numbers? How will you find the numbers belonging to R10 series?	7 Marks
		(OR)	
2	a)	Explain the importance of manufacturing considerations in the design process.	7 Marks
	b)	Define "mechanical properties of an engineering material". State any six mechanical properties and applications of it.	7 Marks

UNIT-II

3	a)	Define stress concentration and also give the sources of stress concentration.	7 Marks
	b)	A rotating bar made of steel 40C8 is subjected to a completely reversed bending stress. The corrected endurance limit of the bar is 315 N/mm² .Calculate the fatigue strength of the bar for a life of 90,000 cycles.	7 Marks
		(OR)	
4		A transmission shaft carries a pulley between two bearings. The bending moment at the pulley varies from 100 N-m to 400 N-m, as the torsional moment in the shaft varies from 50 N-m to 110 N-m. The shaft is made of steel (S_{ut} =540 N/mm², S_{yt}=400 N/mm²). The corrected endurance limit of the shaft is 200 N/mm² .Determine the diameter of the shaft using a factor of safety of 2.	14 Marks

UNIT-III

5	a)	What is meant by the efficiency of the riveted joint?	4 Marks
	b)	Determine the efficiency of a double riveted, chain lap joint used to join 6mm thick plates with 20mm diameter rivets and 60mm pitch. The permissible stresses are 100 MPa in tension, 120 MPa in crushing and 75 MPa in shear.	10 Marks
		(OR)	
6	a)	Discuss various ways in which a riveted joint may fail.	6 Marks
	b)	Two plates of 10mm thick are joined by means of a single riveted, double strap butt joint. The rivet diameter is 20mm and pitch of the rivets is 60mm. The permissible stresses are: σ_t =80 MPa, σ_c = 120 MPa, τ = 60 MPa. Calculate the efficiency of the joint.	8 Marks

UNIT-IV

7	a)	How are the keys classified? Draw neat sketches of different types of keys and state their applications.	7 Marks
	b)	A solid circular shaft is subjected to a bending moment of 3000 N-m and a torque of 10 000 N-m. The shaft is made of 45C8 steel having ultimate tensile stress of 700 MPa and a ultimate shear stress of 500 MPa. Assuming a factor of safety as 6, determine the diameter of the shaft.	7 Marks

(OR)

8	a)	How do you classify shaft couplings?	4 Marks
	b)	Design a muff coupling for a shaft transmitting 30kW at 300 r.p.m. The material adopted for shaft is plain carbon steel (SAE 1040) and muff coupling is grey cast iron (FG 200).The key is also made of plain carbon steel. Design torque on the shaft may be taken as 1.15 times the average torque.	10 Marks

UNIT-V

9	a)	What are the applications of a cotter joints?	4 Marks
	b)	Describe the design procedure of a Knuckle joint.	10 Marks

(OR)

10		Design a knuckle joint to transmit 150 kN. The design stresses may be taken as 75 MPa in tension, 60 MPa in shear and 150 MPa in compression.	14 Marks

CODE No.:14BT50401 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations August – 2021

ANTENNAS AND PROPAGATION

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Briefly explain the following terms related to antenna: 14 Marks
(i) Antenna apertures. (ii) Radiation resistance.
(iii) Patterns. (iv) Beam width.

(OR)

2 a) Explain about the current distributions of half wave dipole. 6 Marks
b) The maximum radiation intensity of 96% efficiency antenna is 180mW/unit solid angle. Find the directivity and gain (dB), when the: 8 Marks
(i) input power is 125.66 mW. (ii) radiated power is 125.66mW.

UNIT-II

3 a) For a 10-element binomial array with spacing of $\lambda/2$ between the elements. Determine the half power beam width and maximum directivity (dB). 8 Marks
b) Briefly explain the concept of scanning arrays. 6 Marks

(OR)

4 a) Explain binomial array. 8 Marks
b) Distinguish between binomial and uniform linear arrays. 6 Marks

UNIT-III

5 a) What is Yagi-Uda antenna? Explain its construction and properties with special reference to the directivity, bandwidth and impedance. 8 Marks
b) Explain folded diploes and their characteristics. 6 Marks

(OR)

6 a) Discuss the design considerations for monofilar helical antenna in axial mode. 7 Marks
b) With neat diagram, explain the geometry of parabolic reflector. 7 Marks

UNIT-IV

7 Explain the techniques used for measuring the directivity in detail. 14 Marks

(OR)

8 Explain the concept of Zoning and specify the tolerances of zoned and un-zoned nonmetallic dielectric lens antennas. 14 Marks

UNIT-V

9 a) Derive expression for the field strength, due to space wave propagation at a point away from the transmitter. 7 Marks
b) Explain salient features of Sommer field's theory. 7 Marks

(OR)

10 a) Explain the terms wave tilt, virtual height, MUF, Skip distance and critical frequency. 7 Marks
b) Derive an expression for the refractive index of the ionosphere in terms of 'N' and frequency. 7 Marks

CODE No.:14BT50405 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations August – 2021

PULSE AND DIGITAL CIRCUITS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the operation of parallel RLC circuit and its response to a step input.	7 Marks
	b)	Explain the operation of high-pass RC circuit with different time constants compared to input pulse width. Draw the input and output waveforms.	7 Marks
		(OR)	
2	a)	Explain ringing circuit, and attenuator.	7 Marks
	b)	Explain the application of an attenuator as CRO probe.	7 Marks

UNIT-II

3	a)	Explain the following terms pertaining to transistor switching times. i) Rise time. ii) Delay time. iii) Storage time.	9 Marks
	b)	Explain synchronized clamping.	5 Marks
		(OR)	
4	a)	Explain positive and negative clippers with neat circuit diagrams and waveforms.	7 Marks
	b)	Explain the effects of diode characteristics on clamping voltage.	7 Marks

UNIT-III

5		Draw and explain the circuit of Collector-Coupled Monostable Multivibrator with necessary waveforms and also derive the expression for pulse width.	14 Marks
		(OR)	
6	a)	Discuss in detail about Transistor switching times with relevant diagrams.	6 Marks
	b)	Design a Collector-Coupled Astable multivibrator with frequency 1KHz, h_{FE}= 50, $1c(sat)$ = 5mA, $V_{CE(sat)}$= 0.2, V_{cc}=12. Assume $R_1 = R_2$, $C_1=C_2$.	8 Marks

UNIT-IV

7	a)	Define the following: i) Sweep-speed error. ii) Displacement error. iii) Transmission error.	6 Marks
	b)	Explain the principle and working of a transistor Bootstrap time-base generator.	8 Marks
		(OR)	
8	a)	Briefly explain the concept of pulse synchronization of relaxation devices.	6 Marks
	b)	With the help of circuit diagram and waveforms, explain frequency division by an Astable multivibrator.	8 Marks

UNIT-V

9	a)	With neat diagram, analyze the working of bidirectional sampling gate using two transistors.	6 Marks
	b)	Discuss the applications of Sampling gates.	8 Marks
		(OR)	
10	a)	Draw and explain the circuit of Two-input TTL NAND gate.	6 Marks
	b)	Implement OR and AND gates using diodes and transistors.	8 Marks

CODE No.:14BT51003 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations August – 2021

LINEAR AND DIGITAL IC APPLICATIONS

[Electrical and Electronics Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Distinguish between practical and ideal op-amp. Draw its equivalent circuit.	7 Marks
	b)	With the help of suitable examples, explain how the Slew Rate affects the frequency response of an op-amp.	7 Marks
		(OR)	
2	a)	Define the following terms: i) Input bias current. ii) Input offset voltage.	4 Marks
	b)	Explain the frequency compensation technique in an op-amp.	10 Marks

UNIT-II

3	a)	Draw the circuit of a typical instrumentation amplifier. Why do we use two-stage op-amp circuit as an instrumentation amplifier? Explain.	8 Marks
	b)	With neat sketches, explain the frequency response of different filters.	6 Marks
		(OR)	
4	a)	Draw the circuit of voltage to current converter and explain its operation.	7 Marks
	b)	Design a differentiator to differentiate an input signal that varies in frequency from 10 Hz to about 1 KHz.	7 Marks

UNIT-III

5	a)	Explain the block diagram of PLL.	7 Marks
	b)	Design a symmetrical square wave generator with a frequency of 5KHz. Draw the circuit and respective waveform.	7 Marks
		(OR)	
6	a)	Define capture-range, lock-range and pull-in time of PLL.	6 Marks
	b)	Design a monostable multivibrator using 555 timer to produce a pulse width of 100ms.	8 Marks

UNIT-IV

7	a)	What do you mean by 5V tolerant inputs?	3 Marks
	b)	Define DC noise margin with reference to TTL gate.	3 Marks
	c)	Draw and explain the circuit diagram of 2-input ECL NOR/OR gate.	8 Marks
		(OR)	
8	a)	Explain the following terms with reference to CMOS logic: i) Logic levels. ii) Power supply rails.	6 Marks
	b)	Briefly explain about CMOS/TTL interfacing.	8 Marks

UNIT-V

9	a)	Explain about Verilog as HDL.	7 Marks
	b)	Write a Verilog code for half-adder using CMOS switches.	7 Marks
		(OR)	
10	a)	Design 8**:**1 Multiplexer using 2**:**1 multiplexer.	7 Marks
	b)	Write a Verilog program for a Mod 10 counter.	7 Marks

CODE No.:14BT51202 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations August – 2021

SOFTWARE ENGINEERING
[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the changing nature of the software.	7 Marks
	b)	Sketch and explain about a software process framework.	7 Marks
		(OR)	
2	a)	Describe scrum process model with neat diagram.	7 Marks
	b)	Explain the prototyping process model with a neat diagram.	7 Marks

UNIT-II

3	a)	What are the difficulties in Elicitation?	4 Marks
	b)	Design Interaction model for word processor.	10 Marks
		(OR)	
4	a)	Explain the requirements management principles and procedures.	7 Marks
	b)	What is System Modeling? List out and briefly explain various models.	7 Marks

UNIT-III

5	a)	Explain Re-engineering process model with a neat sketch.	7 Marks
	b)	Define software Architecture. Why is architecture important? Explain.	7 Marks
		(OR)	
6	a)	Explain in-detail about Architectural Patterns.	7 Marks
	b)	Write the steps involved in interface design.	7 Marks

UNIT-IV

7	a)	Define debugging. Explain the process of debugging.	9 Marks
	b)	Write short notes on White box testing technique.	5 Marks
		(OR)	
8	a)	What are the various testing strategies for conventional software?	9 Marks
	b)	Differentiate between verification and validation.	5 Marks

UNIT-V

9	a)	Compare and contrast reactive and proactive risk strategies.	7 Marks
	b)	Briefly write about software Reliability.	7 Marks
		(OR)	
10	a)	Write short notes on RMMM.	7 Marks
	b)	Define Quality and write about quality concepts.	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

PROFESSIONAL ETHICS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Briefly explain the general types of enquiries involved in engineering inspection.	6 Marks
	b)	What is meant by professional conscience and right of conscientious refusal?	8 Marks
		(OR)	
2	a)	Why is it important to study the subject of professional ethics?	6 Marks
	b)	How did Gilligum view the three levels of moral development initiated by Kholbuerg?	8 Marks

UNIT-II

3	a)	Mention the different types of ethical theories. What are its uses?	8 Marks
	b)	Explain in detail about role of law of Engineering.	6 Marks
		(OR)	
4	a)	Write short notes on theories of right action.	6 Marks
	b)	Explain in detail the qualities of professional practitioners.	8 Marks

UNIT-III

5	a)	What are the issues involved in maintenance?	6 Marks
	b)	Explain the concept of interest with examples from consulting Engineers.	8 Marks
		(OR)	
6	a)	What is the importance of industrial standard?	6 Marks
	b)	How do the different ways and means of the "code of ethics" help the Engineers?	8 Marks

UNIT-IV

7	a)	List the rights conferred on citizen in the constitution.	6 Marks
	b)	Explain the concept of whistle blowing and the conditions expected for whistle blowing.	8 Marks
		(OR)	
8	a)	Explain the respect for authority in detail.	6 Marks
	b)	List the advantages and limitations of collective bargaining.	8 Marks

UNIT-V

9	a)	"Engineers shine better as managers". Discuss.	6 Marks
	b)	What is known as technology transfer? Why is it so critical in defence / aerospace industries?	8 Marks
		(OR)	
10	a)	"Engineers in weapon development" - Discuss	8 Marks
	b)	Describe the ethics related to multinational corporations.	6 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

SOIL MECHANICS
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Describe different types of soil structure.	5 Marks
	b)	A partially saturated soil sample has a volume of $6 \times 10^{-5} m^3$ and weighs 1N. The sample is dried in the oven and its dry weight is found to be 0.78N. The specific gravity of solid particles is 2.65. Determine degree of saturation.	9 Marks

(OR)

2	a)	Differentiate between the submerged unit weight and saturated unit weight.	5 Marks
	b)	Describe I.S classification of soils.	9 Marks

UNIT-II

3	a)	What are the properties of the flow nets?	6 Marks
	b)	A falling head permeability test was carried out on a 12.7cm long sample of silty clay. The diameter of the sample and the stand pipe were10cm and 1.0cm respectively. The water level in the stand pipe was observed to fall from 85cm to 55cm in 17minutes. Determine the co-efficient of permeability of the soil and height of water level in the stand pipe after another 17minutes.	8 Marks

(OR)

4		In a deposit of silt, the water table which was at originally at a depth of 1m below ground level was lowered to 3m below ground level. The silt above water table was capillary-saturated. The saturated unit weight of silt was $20kN/m^3$. What is the change in effective pressure at a depth of 0.0m, 1.0m and 3.0m?	14 Marks

UNIT-III

5	a)	State the assumptions of Boussinesq's theory of stress distribution in soils.	4 Marks
	b)	Derive an expression for a vertical stress below the centre of circular area supporting a uniformly distributed load at the surface. Use bousinesq's theory.	10 Marks

(OR)

6	a)	What is compaction curve and describe zero-air void curve with a sketch.	6 Marks
	b)	Explain how field control of compaction soil is achieved. Describe at least one example in each case.	8 Marks

UNIT-IV

7		Explain briefly Terzaghi's theory of one dimensional consolidation and derive its equation.	14 Marks

(OR)

8	a)	Define: i) Preconsolidation pressure. ii) Compression index. iii) Degree of saturation. iv) Coefficient of consolidation.	6 Marks
	b)	The liquid limit of a normally consolidated clay sample is 58%. At a stress of $100kN/m^2$, the void ratio is 1.05. Calculate the void ratio if the stress is increased to $200kN/m^2$. If the clay year thickness is 5m, what is the total settlement?	8 Marks

UNIT-V

9	a)	Explain the critical void ratio and pore pressure coefficients in detail.	6 Marks
	b)	A cylindrical specimen of saturated soil fails under an axial stress 150kN/m^2 in an unconfined compression test. The failure plane makes an angle of 52^0 with the horizontal. Calculate the cohesion and angle of internal friction of the soil.	8 Marks

(OR)

10	a)	State the advantages and limitations of direct shear test.	8 Marks
	b)	Describe pore pressure parameters. State its importance in shear strength of soils.	6 Marks

❀ ❀ ❀

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

CONTROL SYSTEMS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

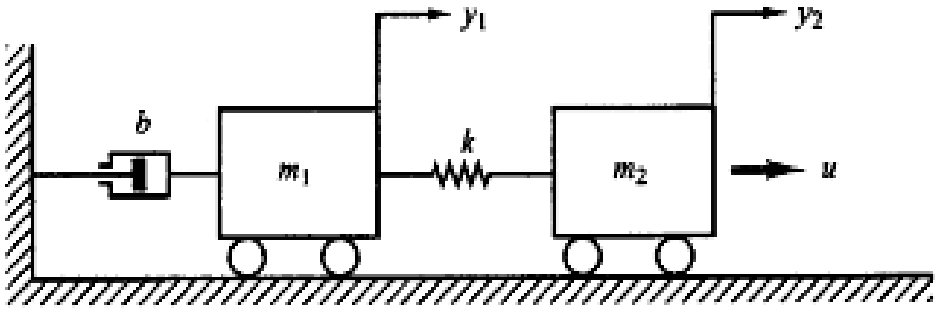
UNIT-I

1 a) What is control system? Explain the components of control system with the help of block diagram. 6 Marks

b) What is block diagram? Explain all the rules used for block diagram reduction method. 8 Marks

(OR)

2 a) Write the differential equations governing the mechanical system shown below. Draw the force Voltage and force current electrical analogous circuits and verify it by using mesh and nodal analysis for the figure shown below and determine its transfer function. 10 Marks



b) Write short notes on synchro transmitter. 4 Marks

UNIT-II

3 a) Find K_p, K_v and K_a for the open-loop transfer function of a unity feedback system given by $G(s) = \frac{10}{s(0.1s + 1)}$ 4 Marks

b) Derive the expressions for time domain specifications t_r, t_p, max peak overshoot for under damped second order system with unit step input. 10 Marks

(OR)

4 a) Obtain the time response for First order system with respect to input test signals 8 Marks

b) Explain about generalized error constants in control systems. 6 Marks

UNIT-III

5 A unity feedback system has an open loop transfer function 14 Marks

$$G(s)H(s) = \frac{K}{s(s+3)(s^2+2s+2)}$$

Sketch the root locus as 'K' varies from 0 to ∞.

(OR)

6 a) Sketch the root locus plot of a unity feedback system with an open loop transfer function $G(s) = \frac{K}{s(s+2)(s+4)}$. 8 Marks

b) Discuss the effect of addition of poles and zeros to the open loop transfer function. 6 Marks

UNIT-IV

7 a) The open loop transfer function of a unity feedback control system is given below $G(s) = \frac{50}{S(S+5)}$. Draw the Nyquist plot and comment on the stability of the closed loop system. 8 Marks

b) A second order system has overshoot of 50% and period of oscillation 0.2s in step response. Determine resonant peak, resonant frequency and bandwidth. 6 Marks

(OR)

8 a) Derive expressions for Resonant peak magnitude and resonant frequency. 8 Marks

b) Derive the transfer functions for Lead and Lag compensation networks. 6 Marks

UNIT-V

9 a) Construct state model for the fallowing differential equation $\mathbf{3y_4+5y_3+6y_2+7y_1+4y_0 = 3u_0}$. 7 Marks

b) Obtain the state variable representation for Armature controlled DC motor. 7 Marks

(OR)

10 a) State and explain controllability and observability. 6 Marks

b) The transfer function of a control system is given by $\frac{Y(s)}{U(s)} = \frac{S+2}{S^3+9S^2+26S+24}$. 8 Marks

Check for controllability and observability.

CODE No.:14BT50204 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

TRANSMISSION OF ELECTRIC POWER

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Derive an expression for the inductance of a double circuit, 3-Φ line whose conductors are situated at the corners of a regular hexagon.	7 Marks
	b)	A 25000 KVA, 13.8 KV generator has sub transient reactance of 0.2 p.u. and is connected to a transmission line through a transformer rated 30000 KVA, 13.8 Δ - 230 Y KV with reactance as 0.008 p.u. If the base to be used in calculations is 100 MVA, 220 KV for the transmission line, what p.u. values should be used for the transformer and generator reactance?	7 Marks

(OR)

2	a)	Derive an expression for p.u. impedance of a given base MVA and base KV in terms of new base MVA and new base KV.	5 Marks
	b)	The conductors of a 3-Φ line are placed at the corners of an equilateral triangle. The conductor spacing is 3m and each copper conductor has a diameter of 12.5mm. Calculate resistance, series and shunt reactance per meter per phase of the line. The frequency is 50Hz.	9 Marks

UNIT-II

3	a)	A 60Hz, 250km line has an impedance of (33+j104)Ω and admittance of 10^{-3}Ω. The receiving end load is 50MW at 208KV with 0.8pf lag. Find the sending end voltage, current, power and power factor using ABCD constants for a nominal π model.	7 Marks
	b)	A 3-phase, 50Hz transmission line is 250km long. The load is 125MW operating at 220KV upf. Evaluate the incident and reflected voltages at receiving end. R = 0.172 Ω/km, L=2.1mH/km and C=0.01μF/km.	7 Marks

(OR)

4	a)	Derive the ABCD constants for a medium transmission line which can be analyzed using nominal π method.	8 Marks
	b)	Using a nominal π model find the sending end voltage and regulation of a 250km three phase line delivering 50MVA at 0.85p.f lag, 132KV, 50Hz. The conductors are spaced 3m apart equilaterally. The conductor diameter is 1.6cm and resistance is 0.11Ω/km.	6 Marks

UNIT-III

5	a)	Show that a traveling wave moves with a velocity of light on the overhead line.	7 Marks
	b)	A 3-Φ transmission line has conductors 1.5 cm in diameter spaced 1m apart in equilateral formation. The resistance and leakage are negligible. Find the natural impedance of the line.	7 Marks

(OR)

6	a)	Write short notes on Beweley's lattice diagram.	6 Marks
	b)	A surge of 200KV traveling on a line of natural impedance 500Ω arrives at a junction with two lines of impedances 700Ω and 300Ω respectively. Find the surge voltages and currents transmitted into each branch line. Also find the reflected surge voltage and current.	8 Marks

UNIT-IV

7	a)	Discuss the phenomenon of corona and corona loss and indicate the circumstances under which they are likely to occur.	7 Marks
	b)	Calculate the disruptive critical voltage for a 3-Φ overhead line which has three smooth round conductors of 12.7mm diameter arranged in a 3m delta. The barometric pressure is 750mm of mercury and the air temperature is -1^0C. The breakdown strength of air is 21KV rms/cm.	7 Marks

(OR)

8	a)	What are the types of insulators?	4 Marks
	b)	A string of 5 suspension insulators is connected across 100KV line. Calculate the distribution of voltage on the insulator discs if the capacitance of each disc to earth is 0.1 of the capacitance of the insulator. Calculate also the string efficiency.	10 Marks

UNIT-V

9		The towers of height 30mt and 90mt respectively support a transmission line conductor at water crossing. The horizontal distance between the towers is 500m. If the tension in conductor is 1600kg, find minimum clearance of conductor and water, clearance mid-way between supports. Weight of conductor is 1.5kg/m. Bases of the towers can be considered to be at water level.	14 Marks

(OR)

10	a)	Explain about different types of grading of cables.	9 Marks
	b)	Determine the insulation resistance of a single core cable of inside diameter 0.03m, outside diameter 0.075m and length 2km. The resistivity of insulating material being 6×10^{12} Ω-m.	5 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations February - 2021

DYNAMICS OF MACHINERY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 The crank and connecting rod of a steam engine are 0.3m and 1.5m in length. The crank rotates at 180 r.p.m. clockwise. Determine the velocity and acceleration of piston when the crank is at 40^0 from the inner dead centre position. Also determine the position of the crank for zero acceleration of the piston. 14 Marks

(OR)

2 A petrol engine with a speed of 3000 r.p.m. has a stroke of 8.75cm. The weight of the connecting rod is 1.75kgf. The length of connecting rod from centre to centre is 17.5cm. The centre of gravity from big end centre is 5.75cm. The radius of gyration about an axis through the center of gravity and perpendicular to the connecting rod is 7.5cm. Find the inertia force of the connecting rod and its direction with the centre line of the connecting rod when the crank makes an angle of 40^0 with I.D.C. Also find inertia torque on the crank shaft. 14 Marks

UNIT-II

3 a) Explain the effect of Gyroscopic couple on a Naval ship during pitching. 7 Marks
b) Explain the effect of Gyroscopic couple on a Aero plane. 7 Marks

(OR)

4 a) List out the few machines in which flywheel are used. 7 Marks
b) What is the function of a flywheel? How does it differ from that of a governor? 7 Marks
The torque delivered by a two-stroke engine is represented by t= (1000 + 300 Sin 2ø-500 Cos 2ø) N.m where ø is the angle turned by the crank from the inner-dead centre. The engine speed is 250 r.p.m. The mass of the flywheel is 400 kg and radius of gyration is 400mm. Determine (i) The power developed (ii) The total percentage fluctuation of speed

UNIT-III

5 1. A cone clutch with one cone angle 20^o is to transmit 7.5kw at 750 r.p.m. The normal intensity of pressure between the contact faces is not to exceed 0.12N/mm^2. The coefficient of friction is 0.2. If face width is 1/5th of mean diameter, find; 14 Marks
   i) The main dimensions of the clutch.
   ii) Axial force required while running.

(OR)

6 A multi-plate clutch has three pairs of contact surfaces. The outer and inner radii of the contact surfaces are 150mm and 80 mm respectively. The maximum axial spring force is limited to 3KN and the co-efficient of friction is 0.3. Assuming uniform wear find the power transmitted by the clutch at 1500 r.p.m. 14 Marks

UNIT-IV

7 The following particulars refer to the Hartnell type of governor. 14 Marks
Weight of each ball = 20 N
Length of bell crank lever arms vertical = 10cm
Length of bell crank lever arms horizontal = 5cm
Distance of fulcrum of each bell crank lever from the axis of rotation= 9cm
Maximum and minimum radii of governor balls are 12cm and 8cm.
The min equilibrium speed is to be 300 r.p.m
The max equilibrium speed is 5% greater than min.
Find the stiffness of the spring and the equilibrium speed when the radius of rotation of the balls is 10cm.

(OR)

8 In a porter governor the upper and lower arms are each 200mm long and are each inclined at 30^0 to the vertical when the sleeve is in its lowest position. The points if suspensions are each 36mm from the axis of the spindle. The mass if each rotating ball is 3kg and the central load on the sleeve is 20kg. If the lift of sleeve is 36mm, find the range of speed of the governor. 14 Marks

UNIT-V

9 A cylinder of mass M and radius R rolls without slipping on a cylindrical surface of radius R. Find the natural frequency for small oscillations about the lowest position. 14 Marks

(OR)

10 a) Explain whirling speed of shaft. 6 Marks
b) Derive the expression for critical speed of shaft with a single disc considering damping. 8 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

DESIGN OF MACHINE ELEMENTS-I
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the importance of manufacturing considerations in the design process.	7 Marks
	b)	Define "mechanical properties of an engineering material". State any six mechanical properties and applications of it.	7 Marks
		(OR)	
2	a)	What are the steps to be followed while designing a machine element?	7 Marks
	b)	Define the following properties of a material: i) Ductility. ii) Toughness. iii) Hardness. iv) Creep.	7 Marks

UNIT-II

3	a)	What is meant by endurance strength of a material? How do the size and Surface condition of a component and type of load and effect such strength?	4 Marks
	b)	A circular bar of 500mm length is supported freely at its two ends. It is acted upon by a central concentrated cyclic load having a minimum value of 20kN and maximum value of 50kN. Determine the dia of bar by taking a factor of safety of 1.5, size effect of 0.85, surface finish factor of 0.9. The material properties of bar are given by ultimate strength of 650MPa, yield strength of 500MPa and endurance strength of 350MPa.	10 Marks
		(OR)	
4	a)	Formulate Soderberg's equation and state its application to different types of loading.	6 Marks
	b)	A 50mm diameter shaft is made from carbon steel having ultimate tensile strength of 630MPa. It is subjected to a torque which fluctuates between 2000N-m to 800N-m. Using Soderberg method, calculate the factor of safety. Assume suitable values for any other data needed.	8 Marks

UNIT-III

5	a)	Discuss the bolt of uniform strength in detail.	7 Marks
	b)	A steam engine cylinder has an effective diameter of 350mm and the maximum steam pressure acting on the cylinder cover is 1.25N/mm^2. Calculate the number and size of studs required to fix the cylinder cover, assuming the permissible stress in the studs as 33MPa.	7 Marks
		(OR)	
6	a)	Discuss various ways in which a riveted joint may fail.	6 Marks
	b)	Two plates of 10mm thick are joined by means of a single riveted, double strap butt joint. The rivet diameter is 20mm and pitch of the rivets is 60mm. The permissible stresses are: σ_t = 80MPa, σ_c = 120MPa, τ = 60MPa. Calculate the efficiency of the joint.	8 Marks

UNIT-IV

7	a)	Prove that a square key is equally strong is shear and compression	6 Marks
	b)	A standard splined connection 8 x 36 x 40 is used for a gear and shaft assembly rotating at 700 r.p.m. The length of the gear hub is 50mm the normal pressure on the spines is limited to 6.5N/mm^2. Calculate the power that can be transmitted form gear to shaft.	8 Marks

(OR)

8	a)	How do you classify shaft couplings?	4 Marks
	b)	Design a muff coupling for a shaft transmitting 30kW at 300 r.p.m. The material adopted for shaft is plain carbon steel (SAE 1040) and muff coupling is grey cast iron (FG 200). The key is also made of plain carbon steel. Design torque on the shaft may be taken as 1.15 times the average torque.	10 Marks

UNIT-V

9	a)	What are the applications of a cotter joints?	4 Marks
	b)	Describe the design procedure of a Knuckle joint.	10 Marks

(OR)

10	a)	Distinguish between cotter joint and knuckle joint.	4 Marks
	b)	Discuss the design procedure of spigot and socket cotter joint.	10 Marks

CODE No.:14BT50401 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

ANTENNAS AND PROPAGATION

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Obtain the relations between the potentials and their sources.	7 Marks
	b)	Derive the expression for the power radiated by an alternating current element and hence its radiation resistance.	7 Marks
		(OR)	
2	a)	Derive the expression for radiation resistance of alternating current element.	9 Marks
	b)	Design an antenna with $R_r = 73\Omega$ and $R_L = 2\Omega$.	5 Marks

UNIT-II

3	a)	Derive an expression for a broadside array.	7 Marks
	b)	Calculate the beam width of main lobe of a broadside array.	7 Marks
		(OR)	
4	a)	Explain binomial array.	8 Marks
	b)	Distinguish between binomial and uniform linear arrays.	6 Marks

UNIT-III

5	a)	Explain the construction of horn antenna and its principle of working.	7 Marks
	b)	With neat diagrams, describe the principle of working of 3-element Yagi antenna, listing out its length and spacing requirements.	7 Marks
		(OR)	
6	a)	Explain the geometrical configuration of different reflector types in detail.	7 Marks
	b)	State the features, advantages and limitations of microstrip antenna.	7 Marks

UNIT-IV

7		Describe how gain of an antenna under test can be measured using absolute gain method.	14 Marks
		(OR)	
8	a)	Explain the 3 antenna method of measurement of the gain of a horn antenna with necessary relations.	8 Marks
	b)	Analyze sources of errors in antenna measurements.	6 Marks

UNIT-V

9	a)	Derive expression for the field strength, due to space wave propagation at a point away from the transmitter.	7 Marks
	b)	Explain salient features of Sommerfeld's theory.	7 Marks
		(OR)	
10	a)	Explain the terms wave tilt, virtual height, MUF, Skip distance and critical frequency.	7 Marks
	b)	Derive an expression for the refractive index of the ionosphere in terms of 'N'	7 Marks

and frequency.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

DIGITAL IC APPLICATIONS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Explain various TTL logic familiars.	14 Marks
		(OR)	
2	a)	What kinds of transistors are used in CMOS gates and draw the 2 input XOR gate using CMOS logic?	7 Marks
	b)	Explain the electrical characteristics of BJT inverter.	7 Marks

UNIT-II

3	a)	Explain clearly about the ASIC design flow.	7 Marks
	b)	Explain the operators used in Verilog HDL.	7 Marks
		(OR)	
4	a)	What are the language constructions used in Verilog HDL.	7 Marks
	b)	Write a Verilog program for four bit bidirectional shift register.	7 Marks

UNIT-III

5	a)	Explain the standard 3 x 8 decoder and implement One bit full adder using decoder.	7 Marks
	b)	Design a 4 x 1 multiplexer using tristate buffers.	7 Marks
		(OR)	
6	a)	Design a 16-bit comparator using 74 x 85 ICs.	8 Marks
	b)	Implement a full adder with two 4 x 1 multiplexers.	6 Marks

UNIT-IV

7	a)	Design a conversion circuit to convert T flip-flop to JK flip-flop.	7 Marks
	b)	Draw and explain the operation of positive edge triggered D flip-flop.	7 Marks
		(OR)	
8	a)	Design a conversion circuit to convert SR flip-flop to JK flip-flop.	7 Marks
	b)	Design a 4-bit, 4-state ring counter using 74 x 194.	7 Marks

UNIT-V

9	a)	Explain the internal structure of 64K x 1 DRAM. With the help of timing waveforms, discuss DRAM access.	8 Marks
	b)	Realize the logic function performed by 74 x 381 with ROM.	6 Marks
		(OR)	
10		Discuss how PROM, EPROM and EEPROM technologies differ from each other.	14 Marks

CODE No.:14BT50405 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

PULSE AND DIGITAL CIRCUITS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Obtain the response of RC high-pass circuit for square input for different time constants with neat sketches.	8 Marks
	b)	Justify how a Low-pass RC circuit acts as an Integrator.	6 Marks
		(OR)	
2	a)	Explain ringing circuit and attenuator.	7 Marks
	b)	Explain the application of an attenuator as CRO probe.	7 Marks

UNIT-II

3	a)	Define clipper. Explain the clipping using zero diodes.	7 Marks
	b)	Draw a transistor clipper and explain its operation.	7 Marks
		(OR)	
4	a)	State and prove Clamping circuit theorem.	7 Marks
	b)	What is the difference between the output from a clipping circuit and a clamping circuit? Explain with neat sketches.	7 Marks

UNIT-III

5	a)	Give the design procedure for emitter coupled monostable multivibrator.	7 Marks
	b)	Design an astable multivibrator to produce an output with 100 msec ON period and 50 msec OFF period for V_{CC} = 18V, h_{FE} = 60, $I_{C\,(sat)}$ = 100 μA.	7 Marks
		(OR)	
6	a)	Explain the working of collector coupled astable multivibrator with circuit diagram and wave forms.	7 Marks
	b)	Explain the use of a monostable relaxation circuit as a frequency divider with the help of neat diagram and wave forms.	7 Marks

UNIT-IV

7		Write notes on the following:	
		i) Differentiate voltage and current time based generators.	7 Marks
		ii) Monostable blocking oscillators.	7 Marks
		(OR)	
8	a)	Draw transistor Bootstrap time base generator and explain its operation.	7 Marks
	b)	Which type of time base generator is used in electromagnetic and electrostatic deflection systems? Explain.	7 Marks

UNIT-V

9	a)	What is Pedestal? How can pedestal be reduced in a sampling gate circuit?	7 Marks
	b)	Draw the circuit of an emitter-coupled bidirectional sampling gate and explain.	7 Marks
		(OR)	

10	a)	Sketch and explain the working of CMOS inverter	7 Marks
	b)	Realize OR gate using diodes and transistors.	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

THEORY OF COMPUTATION

[Computer Science and Engineering, Information Technology]

Time: 3 hours **Max. Marks: 70**

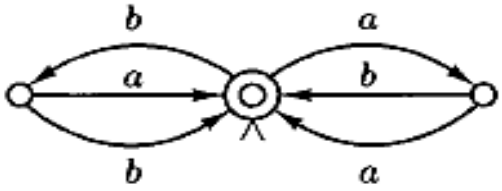
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	Let L be a set accepted by a NFA and then prove that there exists DFA that accepts L.	14 Marks
	(OR)	
2	Design a NFA accepts the following strings over the alphabets {0**.**1} The set of all string that beings with 01 and ends with 11. Check for the validity of 01111 and 0110 strings.	14 Marks

UNIT-II

3	Let L be any subset of 0*. Prove that L* is regular.	14 Marks
	(OR)	
4	Construct regular expression equivalent to the following DFA.	14 Marks



UNIT-III

5	Find a CFG equivalent with no useless symbols equivalent to S → AB | CA A → a B → BC | AB C → aB | b	14 Marks
	(OR)	
6	Construct a PDA equivalent to the following grammar. S → aAA A → aS |bS |a	14 Marks

UNIT-IV

7	Compare Two-way infinite tape TM and multiple tracks TM.	14 Marks
	(OR)	
8	Construct a TM to perform copy operation.	14 Marks

UNIT-V

9	Show that it is undecidable whether a TM halts on all inputs.	14 Marks
	(OR)	
10	Prove that the union of two recursive languages is recursive and the union of two recursively enumerable languages is recursively enumerable.	14 Marks

❀ ❀ ❀

CODE No.:14BT50502 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

UNIX INTERNALS

[Computer Science and Engineering, Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Comment on "UNIX system has become more popular now-a-days".	7 Marks
	b)	Give brief description about the UNIX file subsystem.	7 Marks
		(OR)	
2	a)	Explain about process execution levels and memory management.	7 Marks
	b)	Describe about the processing of environment.	7 Marks

UNIT-II

3	a)	Explain the use of grep family in text processing.	7 Marks
	b)	Define a Shell and explain the responsibilities of Shell.	7 Marks
		(OR)	
4	a)	Explain briefly about the control structures in shell programming	8 Marks
	b)	List the backup utilities and explain briefly with examples.	6 Marks

UNIT-III

5	a)	Explain briefly File and Directory maintenance with an example.	10 Marks
	b)	Define a file descriptor and explain it briefly with a simple program.	4 Marks
		(OR)	
6	a)	Explain the procedure to create a new file descriptor by using open system call.	7 Marks
	b)	Discuss in detail about the fopen( ) and fread( ) system calls.	7 Marks

UNIT-IV

7	a)	Explain briefly about the signal functions. i) Kill. ii) Raise. iii) Alarm. iv) Pause.	7 Marks
	b)	Explain the use of read and write Locks in files with an example program.	7 Marks
		(OR)	
8	a)	Explain about the Interrupted system calls.	7 Marks
	b)	Discuss about Mandatory locking.	7 Marks

UNIT-V

9		Write short notes for the following: i) Parent and child processes. ii) Semaphores. iii) Socket communications. iv) Process pipes.	14 Marks
		(OR)	
10		Write the significance for the following: (i) msgget. (ii) msgsnd. (iii) msgctl. (iv) shmget. (v) shmat. (vi) pipe call.	14 Marks

CODE No.:14BT51003 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

LINEAR AND DIGITAL IC APPLICATIONS

[Electrical and Electronics Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define the following: i) Slew Rate. ii) PSRR. iii) Thermal drift.	6 Marks
	b)	Operational amplifier has differential gain of 80 dB and CMRR of 100 dB. If V_1 = 2μV and V_2 = 1.6μV, then calculate output voltages for differential and common-mode input signal operations.	8 Marks
		(OR)	
2	a)	List the characteristics of an ideal op-amp.	4 Marks
	b)	Explain in detail about the AC characteristics of an op-amp.	10 Marks

UNIT-II

3	a)	Explain Current to Voltage converter.	7 Marks
	b)	Design an integrator to integrate a square wave of +/- 5V with a frequency of 3KHz. Draw the input and output waveforms.	7 Marks
		(OR)	
4	a)	Derive the transfer function and magnitude for a low pass first order filter.	7 Marks
	b)	Design a Schmitt trigger for an upper threshold voltage of 4V and lower threshold voltage of -2V for saturated voltages of +/- 14V.	7 Marks

UNIT-III

5	a)	List out the applications of PLL and explain any two applications.	7 Marks
	b)	Design a 555 timer astable multivibrator operating at 20 KHz with 40% duty cycle.	7 Marks
		(OR)	
6	a)	Explain the operation of dual slope A/D converter.	7 Marks
	b)	Draw and explain VCO working principle and derive a equation for its free running.	7 Marks

UNIT-IV

7	a)	Explain low voltage CMOS logic and interfacing.	7 Marks
	b)	Realize the Boolean function [(AB+CD) E]' using CMOS logic.	7 Marks
		(OR)	
8	a)	Discuss the steady state behavior of CMOS devices.	7 Marks
	b)	Realize XOR gate using ECL logic. Explain.	7 Marks

UNIT-V

9	a)	Design a full adder using gate level modeling.	7 Marks
	b)	Explain various data types of Verilog HDL in detail.	7 Marks
		(OR)	
10	a)	Explain blocking and non-blocking statements with example.	7 Marks

b) Using two 8:1 MUX design and implement a 16:1 Multiplexer in Verilog HDL. 7 Marks

CODE No.:14BT50201 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations January – 2022

CONTROL SYSTEMS
[Electrical and Electronics Engineering]

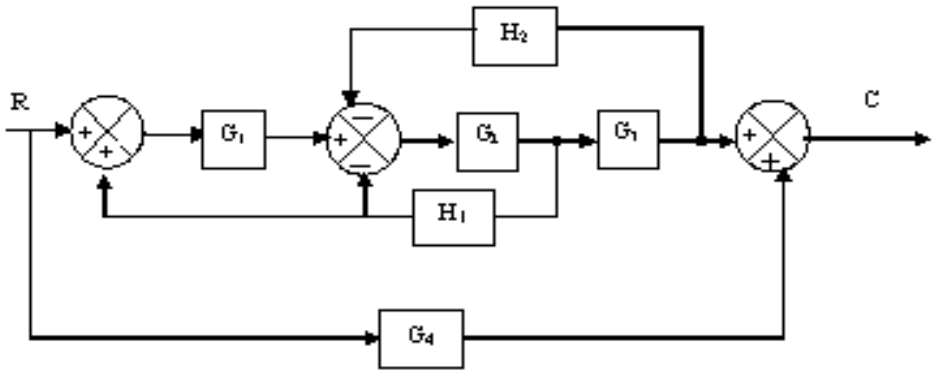
Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

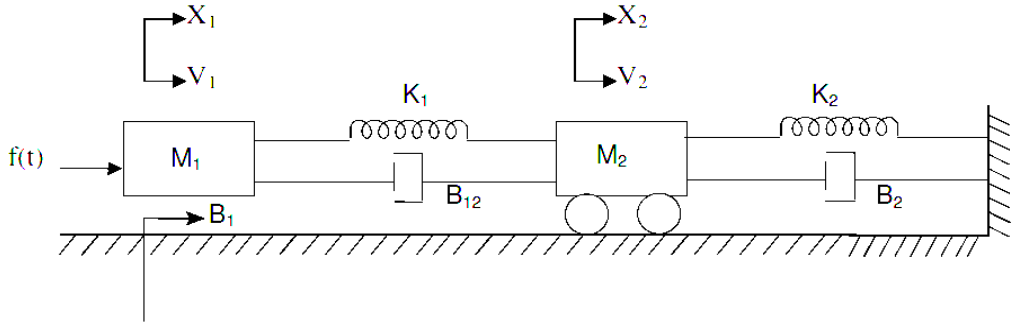
1 a) Explain the open loop and closed loop control system with an example. 7 Marks

b) Find the transfer function C/R using block diagram reduction method. 7 Marks



(OR)

2 Write the differential equations governing the mechanical system shown below. Draw the force-voltage and force-current electrical analogous circuits and verify by writing mesh and node equations. 14 Marks



UNIT-II

3 a) Obtain the time response for First order system with respect to input test signals 8 Marks

b) Explain about generalized error constants in control systems. 6 Marks

(OR)

4 a) Explain the generalized error coefficients for step input ramp and parabolic inputs. 7 Marks

b) A unity feedback system has $G(s) = \frac{1}{S(1+2S)}$. The input to the system is described by $r(t) = 2 + 4t + 6t^2 + 2t^3$. Determine the generalized error coefficients and express the steady state error as a function of time. 7 Marks

UNIT-III

5 a) The open loop transfer function of a feedback control system is given by $G(s)H(s) = \frac{K}{s(s+4)(s^2+2s+2)}$, using Routh Criterion determine the range of K for which the system is stable. 7 Marks

b) Discuss the effect of adding the Poles and Zeros to given system on the root loci. 7 Marks

(OR)

6 A unity feedback system has an open loop transfer function 14 Marks

$$G(s)\,H(s) = \frac{K}{s(s+3)(s^2+2s+2)}$$

Sketch the root locus as 'K' varies from 0 to ∞.

UNIT-IV

7 a) Derive expressions for Resonant peak magnitude and resonant frequency. 8 Marks

b) Derive the transfer functions for Lead and Lag compensation networks. 6 Marks

(OR)

8 Sketch the magnitude and phase bode plots for the system $G(s) = \frac{10}{s(1+0.5s)(1+0.05s)}$, determine all frequency domain specifications and comment on stability. 14 Marks

UNIT-V

9 a) Derive an expression for the solution of Homogeneous state equations. 7 Marks

b) Determine the State Controllability and Observability of the system using Kalman's test. 7 Marks

$$A = \begin{bmatrix} 0 & 2 & 0 \\ 1 & 2 & 0 \\ -1 & 0 & 1 \end{bmatrix} \qquad B = \begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix} \qquad C = \begin{bmatrix} 1 & 0 & 1 \end{bmatrix}.$$

(OR)

10 a) Obtain state variable representation of a field controlled DC motor. 6 Marks

b) Find the state transition matrix for a given system matrix. $A = \begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix}$. 8 Marks

CODE No.:14BT50203 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations January - 2022

SYNCHRONOUS MACHINES

[Electrical And Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Enumerate various methods used for minimizing harmonics in turbo-alternators.	7 Marks
	b)	What are the harmonics? Explain how the harmonics can be suppresses in an alternator.	7 Marks

(OR)

2	a)	Name the factors responsible for making terminal voltage of an alternator less than the induced voltage. Explain them briefly.	7 Marks
	b)	Mention the differences between salient pole and non salient pole synchronous machine.	7 Marks

UNIT-II

3	a)	Compare synchronous impedance and ampere-turns methods of predetermining voltage regulation of alternator.	7 Marks
	b)	Define synchronous impedance of an alternator and explain how it can be determined experimentally.	7 Marks

(OR)

4	a)	Describe the slip test method for measurement of Xd and Xq of synchronous machine.	7 Marks
	b)	Explain the Ampere-Turn method to find the voltage regulation of an alternator.	7 Marks

UNIT-III

5	a)	What is an infinite bus? Mention three conditions to be satisfied prior to synchronizing an alternator to an infinite bus.	8 Marks
	b)	An alternator is connected to an infinite bus and is running at no load. Explain briefly how to increase its real and reactive power outputs.	6 Marks

(OR)

6		Explain the effect of change in excitation and change in mechanical power input on load sharing of alternators operating in parallel.	14 Marks

UNIT-IV

7		Draw the phasor diagram of a synchronous motor. Explain the effect : (i) change of excitation if load is constant. (ii) change of load if excitation is constant.	14 Marks

(OR)

8	a)	What is meant by constant power circle for synchronous motor? How is it derived?	6 Marks
	b)	Explain the different methods of starting 3-phase synchronous motors.	8 Marks

UNIT-V

9	a)	Explain the operation of a single phase induction motor using split phase technique.	8 Marks
	b)	Explain working of AC series motor with necessary diagrams and mention its applications.	6 Marks

(OR)

10	a)	Explain the principle of operation of universal motor.	7 Marks
	b)	Explain why DC servomotors are preferred over AC servomotors for high power applications.	7 Marks

CODE No.:14BT50301 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations January – 2022

DYNAMICS OF MACHINERY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) The lengths of crank and connecting rod of a horizontal reciprocating engine are 200mm and 800mm respectively. The crank is rotating at 480 r.p.m. Using Klein's constructions find the acceleration of the piston. 7 Marks

b) The lengths of crank and connecting rod of a horizontal reciprocating engine are 100mm and 500mm respectively. The crank is rotating at 400 r.p.m. When the crank has turned 30^0 from the inner dead centre, find analytically i) acceleration of the piston. ii) velocity of the piston. 7 Marks

(OR)

2 a) Explain the procedure to determine the velocity and acceleration of a four-bar mechanism by Klein's construction. 7 Marks

b) What are the Forces on the reciprocating parts of an engine neglecting and considering weight of the connecting rod using Analytical method? 7 Marks

UNIT-II

3 A single cylinder, single acting, four stroke cycle gas engine develops 20kw at 250 r.p.m. The work done by the gases during the expansion stroke is 3 times the work done on the gases during the compression stroke. The work done on the suction and exhaust strokes may be neglected. If the flywheel has a mass of 1.5 tonnes and has a radius of gyration of 0.6m, find the cyclic fluctuation of energy and the coefficient of fluctuation of speed. 14 Marks

(OR)

4 A four wheeled trolley car of total mass 2000kg running on rails of 1.6m gauge, rounds a curve of 30m radius at 54km/h. The track is banked at 8^o. The wheels have an external diameter of 0.7m and each pair whith axle has a mass of 200kg. The radius of gyration for each pair is 0.3m. The height of centre of gravity of the car above the wheel base is 1m. Determine, allowing for centrifugal force and gyroscopic couple actions, the pressure on each rail. 14 Marks

UNIT-III

5 a) Describe with a neat sketch the working of a single plate clutch. 6 Marks

b) Differentiate between: 8 Marks

i) Brakes and dynamometer.
ii) Absorption dynamometer and transmission dynamometer

(OR)

6 Summarize with the help of a neat sketch the principles of operation of an internal expanding shoe. Derive the expression for the braking torque. 14 Marks

UNIT-IV

7 Explain the term height of the governor. Derive an expression for the height in the case of a Watt governor. What are the limitations of a Watt governor? 14 Marks

(OR)

8		A single cylinder horizontal engine runs at 120 r.p.m. The length of stroke is 400mm. The mass of the revolving parts assumed concentrated at the crank pin is 100kg and mass of the reciprocating parts is 150kg. Determine the magnitude of the balancing mass required to be placed opposite to the crank at a radius of 150mm which is equivalent to all the revolving and 2/3rd of the reciprocating masses. If the crank turns 30º from the inner dead centre, find the magnitude of the unbalanced force due to the balancing mass.	14 Marks

UNIT-V

9	a)	What do you understand by 'torsionally equivalent shaft'?	7 Marks
	b)	Describe in detail the method of finding the frequency of torsional vibration of a two rotor system.	7 Marks

(OR)

10		Illustrate the effect of inertia of the shaft in longitudinal and transverse vibrations.	14 Marks

CODE No.:14BT50303 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations January – 2022

THERMAL ENGINEERING - II
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Draw the diagram of spring loaded safety valve and give its working principle.	8 Marks
	b)	Differentiate between water tube and fire tube boilers.	6 Marks
		(OR)	
2	a)	What is a boiler? Explain the classification of boilers.	7 Marks
	b)	What is the necessity for safety valves in a boiler?	7 Marks

UNIT-II

3	a)	Why Rankine cycle is preferred for larger power generation?	7 Marks
	b)	Saturated steam at 18 bar abs. enters the turbine of a steam power plant and expands to a condenser pressure of 0.8 bar. Determine the Rankine efficiency.	7 Marks
		(OR)	
4		Describe the different operations of rankine cycle. Derive also the expression for its efficiency with neat sketch, p-V, T-s and h-s diagrams of rankine cycle.	14 Marks

UNIT-III

5		Define nozzle efficiency. Explain the effect of friction on the performance of the nozzle with the help of h-s diagram.	14 Marks
		(OR)	
6	a)	Explain the functions of nozzles used with steam turbines.	7 Marks
	b)	Steam at a pressure of 10 bar and 210^0C is supplied to a convergent divergent nozzle with a throat area of 1,500m^2. The exit is below critical pressure. Find the coefficient of discharge, if the flow is 7,200 kg of steam per hour.	7 Marks

UNIT-IV

7		Explain single-stage impulse turbine with the help of a neat sketch. Also explain the pressure and velocity variations along the axial direction.	14 Marks
		(OR)	
8		In a reaction turbine blade tips are inclined at 300 and 200 to the direction of motion. The fixed blades and the moving blades are of the same shape but reversed in direction. At a certain point in the turbine the drum diameter is 0.9 m and the blade height 100 mm. the steam at this point is at 3.4 bar and is 90 % dry. If the turbine runs at 300 R.P.M, find the power developed in the ring of blades.	14 Marks

UNIT-V

9		Explain with a sketch the working of a constant pressure open cycle gas turbine. In what way the actual cycle differs from the theoretical cycle?	14 Marks
		(OR)	
10	a)	Explain briefly with a sketch the working principle of a rocket.	7 Marks
	b)	With the aid of the schematic diagram and thermodynamic cycle, explain the working of a turbo jet engine.	7 Marks

CODE No.:14BT50305 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations January - 2022

DESIGN OF MACHINE ELEMENTS-I

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) What are preferred numbers? Mention their advantages. 7 Marks

b) State the mechanical properties of metals and explain briefly. 7 Marks

(OR)

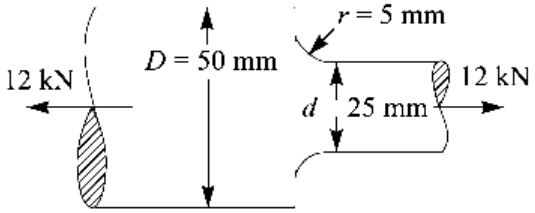
2 a) Explain the basic modes of failure of mechanical components with examples. 7 Marks

b) Describe the process of selection of engineering materials. 7 Marks

UNIT-II

3 a) How to reduce the stress concentration in threaded members? 6 Marks

b) Find the maximum stress induced in the following case taking stress concentration into account: A stepped shaft as shown in figure and carrying a tensile load of 12 kN. 8 Marks



(OR)

4 a) Write short note on the following. 7 Marks

i) Notch sensitivity. ii) Endurance limit. iii) Goodman's line.

b) Illustrate how the stress concentration in a component can be reduced. 7 Marks

UNIT-III

5 a) Discuss the bolt of uniform strength in detail. 7 Marks

b) A steam engine cylinder has an effective diameter of 350 mm and the maximum steam pressure acting on the cylinder cover is 1.25N/mm^2. Calculate the number and size of studs required to fix the cylinder cover, assuming the permissible stress in the studs as 33 MPa. 7 Marks

(OR)

6 a) Discuss various ways in which a riveted joint may fail. 6 Marks

b) Two plates of 10 mm thick are joined by means of a single riveted, double strap butt joint. The rivet diameter is 20 mm and pitch of the rivets is 60 mm. The permissible stresses are: σ_t =80 MPa, σ_c = 120 MPa, τ = 60 MPa. Calculate the efficiency of the joint. 8 Marks

UNIT-IV

7 a) How are the keys classified? Draw neat sketches of different types of keys and state their applications. 7 Marks

b) A solid circular shaft is subjected to a bending moment of 3000 N-m and a torque of 10 000 N-m. The shaft is made of 45 C 8 steel having ultimate tensile stress of 700 MPa and a ultimate shear stress of 500 MPa. Assuming a factor of safety as 6, determine the diameter of the shaft. 7 Marks

(OR)

8 a) How do you classify couplings? Explain the function of each in detail. 7 Marks

b) Design the rectangular key for a shaft of 50 mm diameter. The shearing and crushing stresses for the key material are 42 MPa and 70 MPa. 7 Marks

UNIT-V

9 Design a sleeve and cotter joint to resist a tensile load of 60 kN. All parts of the joint are made of the same material with the following allowable stresses : σt=60 MPa ; τ = 70 MPa ; and σc = 125 MPa. 14 Marks

(OR)

10 a) Describe the purpose of gib in cotter joint. What are the applications of cotter joints? 4 Marks

b) Design a knuckle joint to transmit 140 kN, with permissible stresses in tension; shear and compression are 75 Mpa; 60 Mpa and 150 Mpa respectively. 10 Marks

CODE No.:14BT50401 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations January – 2022

ANTENNAS AND PROPAGATION
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Explain the following terms related to antenna: (i) Beam efficiency. (ii) Directivity. (iii). Polarization. (iv) Radiated power.	14 Marks
		(OR)	
2	a)	Discuss about the far fields of center-fed antennas with respect to different lengths?	8 Marks
	b)	Differentiate Omni-directional and Isotropic directional radiation patterns of an antenna.	6 Marks

UNIT-II

3	a)	In a linear array of 4 isotropic elements spaced $\lambda/2$ apart and with equal currents fed in phase, plot the radiation pattern in polar coordinates.	7 Marks
	b)	Derive the Fourier Transform method of synthesis of array.	7 Marks
		(OR)	
4	a)	Derive the expression for the array factor of a linear broadside array of '*n*' elements.	7 Marks
	b)	Derive the expressions of null-null beam width of a uniform linear array.	7 Marks

UNIT-III

5	a)	Sketch and explain the constructional features of a helical antenna.	7 Marks
	b)	Discuss the characteristics, merits and demerits of a folded dipole.	7 Marks
		(OR)	
6	a)	Discuss the design considerations for monofilar helical antenna in axial mode.	7 Marks
	b)	With neat diagram, explain the geometry of parabolic reflector.	7 Marks

UNIT-IV

7	a)	Differentiate different gain measurement techniques of an antenna.	7 Marks
	b)	Analyze source of errors regarding antenna measurements.	7 Marks
		(OR)	
8	a)	Describe a method of measurement of radiation pattern with neat measurement setup.	7 Marks
	b)	What is polarization and describe polarization measurement by power measurement approach?	7 Marks

UNIT-V

9	a)	Explain the structural details of the ionosphere.	8 Marks
	b)	List the effects of D-layer in the sky wave propagation.	6 Marks
		(OR)	
10	a)	Derive the fundamental equation for free space propagation.	8 Marks
	b)	Explain the relation between MUF and skip distance in detail.	6 Marks

CODE No.:14BT50402 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations January – 2022

DIGITAL COMMUNICATIONS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Draw the block diagram of a PCM system and explain each block in detail.	8 Marks
	b)	Compare and contrast PCM and DM systems.	6 Marks
		(OR)	
2	a)	Explain the Differential Pulse Code Modulation (DPCM) scheme with neat block diagram.	8 Marks
	b)	Compare the uniform quantization and non uniform quantization.	6 Marks

UNIT-II

3	a)	Derive the expression for output signal power for PCM system.	7 Marks
	b)	Explain the effect of thermal noise in PCM.	7 Marks
		(OR)	
4	a)	Derive an expression for quantization noise and output signal power in DM.	10 Marks
	b)	A voice frequency signal band limited to 3 KHz is transmitted with the use of DM system. The pulse repletion frequency is 30,000 pulses/sec and step size is 40mV. Determine the maximum permissible speech signal amplitude to avoid a slope overload.	4 Marks

UNIT-III

5		Draw the block diagram of Base Band binary data transmission system and explain the role of each block.	14 Marks
		(OR)	
6	a)	Explain the generation, detection, signal space diagram of ASK system.	7 Marks
	b)	Define QAM and draw its constellation diagram for M=8.	7 Marks

UNIT-IV

7	a)	Show that $H(X,Y) = H(X) + H(Y/X) = H(Y) + H(X/Y)$.	8 Marks
	b)	Define the channel capacity in terms of average signal power and noise power.	6 Marks
		(OR)	
8	a)	Describe, how error free communication achieved over noisy channel	8 Marks
	b)	Discuss the practical communication systems in light of Shannon's equation.	6 Marks

UNIT-V

9	a)	Explain Linear Block Codes and Hamming Codes.	7 Marks
	b)	Explain the handling of burst errors in communications.	7 Marks
		(OR)	
10	a)	Explain the decoding of convolutional codes using exhaustive search method.	8 Marks
	b)	Discuss the comparison of coded and uncoded systems.	6 Marks

❀ ❀ ❀

CODE No.:14BT50404 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations January – 2022

LINEAR IC APPLICATIONS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Explain how large open circuit voltage gain of an op-amp can be obtained by using cascading of differential amplifier stages. 14 Marks

(OR)

2 Explain ac analysis of differential amplifier. 14 Marks

UNIT-II

3 a) Draw the circuit of an AC amplifier using op-amp and explain its operation, 7 Marks
b) Using an op-amp, draw the circuit diagram to generate a triangular wave and explain its operation. 7 Marks

(OR)

4 a) Explain how op-amp can be used as a differentiator using necessary expressions. 7 Marks
b) With a near sketch, explain how op-amp can be used as an antilog amplifier. 7 Marks

UNIT-III

5 Discuss the functional block diagram of a 723 voltage regulator and explain one of its applications. 14 Marks

(OR)

6 Explain the advantages of active filters. Explain different configurations of active filters. Discuss their merits and demerits. 14 Marks

UNIT-IV

7 a) Explain about the phase detector and its working in a PLL. 7 Marks
b) Write a short note on monolithic PLL IC 566. 7 Marks

(OR)

8 Explain the following: 14 Marks
i) frequency multiplication. ii) linear ramp generator.

UNIT-V

9 a) Compare R - 2R and weight resistor types of DACs. 7 Marks
b) Define the following terms as related to DAC: 7 Marks
i) Linearity. ii) Resolution.

(OR)

10 a) Explain the difference between Analog to Digital converter and Digital to Analog converters through underlying equations. 7 Marks
b) If an 8 bit ADC outputs all ones when its input is 5.1 V. Find its resolution and its digital output when input is changed to 1.28 V. 7 Marks

❀ ❀ ❀

CODE No.:14BT51003 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations January - 2022

LINEAR AND DIGITAL IC APPLICATIONS

[Electrical and Electronics Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the block diagram and transfer characteristic of an op-amp.	7 Marks
	b)	Derive the expression for output voltage and gain of a practical inverting amplifier.	7 Marks

(OR)

2	a)	With suitable expressions, explain the frequency response of an op-amp.	7 Marks
	b)	With double supply, draw the circuit and explain the operation of inverting amplifier.	7 Marks

UNIT-II

3	a)	Draw the circuit of a typical instrumentation amplifier. Why do we use two-stage op-amp circuit as an instrumentation amplifier? Explain.	8 Marks
	b)	With neat sketches, explain the frequency response of different filters.	6 Marks

(OR)

4	a)	Explain the basic differentiator and how the problems in basic circuit are overcome in a practical circuit.	7 Marks
	b)	Design a second order high pass filter for a lower cut off frequency of 10KHz.	7 Marks

UNIT-III

5	a)	Explain the block diagram of PLL.	7 Marks
	b)	Design a symmetrical square wave generator with a frequency of 5KHz. Draw the circuit and respective waveform.	7 Marks

(OR)

6	a)	Explain the operation of successive approximation type A/D converter.	7 Marks
	b)	Derive the expression for capture range of phase locked loop.	7 Marks

UNIT-IV

7	a)	Explain steady state electrical behavior of CMOS and also explain CMOS-to-TTL interface.	7 Marks
	b)	Compare different logic families and list out their advantages and disadvantages.	7 Marks

(OR)

8	a)	Explain the following terms with reference to CMOS logic: i) Logic levels. ii) Power supply rails.	6 Marks
	b)	Briefly explain about CMOS/TTL interfacing.	8 Marks

UNIT-V

9	a)	Discuss in brief about Verilog operators.	7 Marks
	b)	Write a Verilog program for full-adder in behavioral model.	7 Marks

(OR)

10	a)	Explain the behavioral modeling in Verilog.	7 Marks
	b)	Design a conversion circuit to convert a JK flip-flop from RS flip-flop.	7 Marks

CODE No.:14BT50104 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations June – 2022

SOIL MECHANICS
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Describe the Classification of Coarse grained Soils.	6 Marks
	b)	Obtain the relationship between for the water content, void ratio, specific gravity and degree of saturation.	8 Marks

(OR)

2		A sample of clay taken from a natural stratum was found to be partially saturated and when tested in the laboratory gave the following results. Specific gravity of soil particles is 2.6, wet weight of sample is 250g, dry weight of sample is 210g and volume of sample is 150cm^3. Compute the degree of saturation, water content, porosity and void ratio using phase diagram.	14 Marks

UNIT-II

3		In a deposit of silt, the water table which was at originally at a depth of 1m below ground level was lowered to 3m below ground level. The silt above water table was capillary-saturated. The saturated unit weight of silt was 20kN/m^3. What is the change in effective pressure at a depth of 0.0m, 1.0m and 3.0m?	14 Marks

(OR)

4	a)	Explain effective stress, total stress and neutral stress. What is capillary effect on effective stress of soil?	6 Marks
	b)	A sand deposit of 9 m thick overlies a bed of soft clay. The water table is 3 m below the ground level. If the sand above the ground water table has a degree of saturation of 60 %, plot the diagram showing the variation of the total stress, pore water pressure and the effective stress. Take G = 2.70, void ratio as 0.7.	8 Marks

UNIT-III

5	a)	State the assumptions of Boussinesq's theory of stress distribution in soils.	4 Marks
	b)	Derive an expression for a vertical stress below the centre of circular area supporting a uniformly distributed load at the surface. Use bousinesq's theory.	10 Marks

(OR)

6	a)	What is compaction curve and describe zero-air void curve with a sketch.	6 Marks
	b)	Explain how field control of compaction soil is achieved. Describe at least one example in each case.	8 Marks

UNIT-IV

7		Explain briefly Terzaghi's theory of one dimensional consolidation and derive its equation.	14 Marks

(OR)

8	a)	Differentiate between Normally consolidated soil and Over consolidated soil.	5 Marks
	b)	Explain square root time fitting method to determine coefficient of consolidation.	9 Marks

UNIT-V

9	a)	Explain the basic differences between a box shear test and a triaxial shear test.	6 Marks
	b)	A vane 10.8cm long, 7.2cm in diameter was pressed into a soft clay at the bottom of bore hole, Torque was applied and the vane at the failure was 45Nm. Find the shear strength of clay on a horizontal plane.	8 Marks

(OR)

10 The following are the results were obtained during consolidated undrained shear strength test. Determine Effective Shear strength parameters. 14 Marks

Sample No	Cell Pressure (kN/m^2)	Deviator stress (kN/m^2)	Pore Pressure (kN/m^2)
1	100	150	50
2	200	190	75
3	300	240	135

CODE No.:14BT50301 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations June – 2022

DYNAMICS OF MACHINERY
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 The crank and connecting rod of a steam engine are 0.3m and 1.5m in length. The crank rotates at 180 r.p.m clockwise. Determine the velocity and acceleration of piston when the crank is at 40º from from the inner dead centre position. Also determine the position of the crank for zero acceleration of the piston. 14 Marks

(OR)

2 1. long. The mass of the piston is 1.1kg. The speed is 2000 r.p.m on the expansion stroke with a crank 20º from top dead centre, the gas pressure is 700KN/m². Determine. 14 Marks

i) Net force on the piston. ii) Result load on the gudgeon pin.
iii) Thrust on the cylinder.

Speed above which, other things remaining same, the gudgeon pin load would be reversed in direction.

UNIT-II

3 a) Write expression for gyroscopic couple. 7 Marks

b) Each paddle wheel of a steamer has a mass of 1600 kg and a radius of gyration of 1.2m. The steamer turns to port in a circle of 160m radius at 24Km/hr. The speed of the paddle is 90 r.p.m. Find the magnitude and effect of the gyroscopic couple acting on the steamer. 7 Marks

(OR)

4 a) Explain the effect of Gyroscopic couple on a Naval ship during pitching. 7 Marks

b) Explain the effect of Gyroscopic couple on a Aero plane. 7 Marks

UNIT-III

5 Explain the theory of following brakes. 14 Marks
a) Block brake. b) Band brake. c) Band and block brake.

(OR)

6 a) Describe with a neat sketch the working of a single plate friction clutch. 7 Marks

b) Establish a formula for the maximum torque transmitted by a single plate clutch of external and internal radii r_1 and r_2, if the limiting coefficient of friction is **μ** and the axial spring load is **W**. Assume that the pressure intensity on the contact faces is uniform. 7 Marks

UNIT-IV

7 Explain the term height of the governor. Derive an expression for the height in the case of a Watt governor. What are the limitations of a Watt governor? 14 Marks

(OR)

8 a) How governors are classified? 7 Marks

b) Why rotating masses are to be dynamically balanced? 7 Marks

UNIT-V

9	a)	List out the causes and effects of vibrations.	7 Marks
	b)	Summarize with neat sketches the longitudinal, transverse vibrations.	7 Marks

(OR)

10		Illustrate the effect of inertia of the shaft in longitudinal and transverse vibrations.	14 Marks

CODE No.:14BT50303 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations June – 2022

THERMAL ENGINEERING - II
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the working of Lamont with a neat sketch.	7 Marks
	b)	List out the boiler accessories and explain any one of them with a neat sketch.	7 Marks
		(OR)	
2	a)	What is a boiler? Explain the classification of boilers.	7 Marks
	b)	What is the necessity for safety valves in a boiler?	7 Marks

UNIT-II

3	a)	Draw T-s and h-s diagrams of reheat Rankine cycle with the help of circuit diagram and derive its efficiency.	7 Marks
	b)	Calculate the height of chimney required to produce a draught equivalent to 1.7 cm of water if the flue gas temperature is 270^0C and ambient temperature is 22^0C and minimum amount of air per kg of fuel is 17 kg.	7 Marks
		(OR)	
4	a)	Comment the efficiency of the Modified Rankine cycle with respect to rankine cycle. Also obtain the expression for efficiency of Modified Rankine cycle.	7 Marks
	b)	Explain induced draught and forced draught.	7 Marks

UNIT-III

5		Define nozzle efficiency. Explain the effect of friction on the performance of the nozzle with the help of h-s diagram.	14 Marks
		(OR)	
6		In a propulsion nozzle, gases expand from 400 kPa and 700 K to a back pressure of 99 kPa at the rate of 20 kg/s, coefficient of discharge is 0.98 and nozzle efficiency is 95%. Find the throat and exit areas of the nozzle. For gases, $\gamma = 1.3$ and Cp = 1.10 kJ/kg. Assume that the inlet velocity is negligible.	14 Marks

UNIT-IV

7		The following data refer to a particular stage of a Parson's reaction turbine: Speed of the turbine = 1,500 R.P.M. mean diameter of the rotor =1 m; stage efficiency: 80%; Blade outlet angle = 20^0, Speed ratio = 0.7. Determine the available isentropic enthalpy drop in the stage.	14 Marks
		(OR)	
8		Show that for maximum diagram efficiency of a reaction turbine the blade-steam speed ratio is equal to cos α, where α is the angle of absolute velocity at inlet. State the assumption made. Hence derive an expression for maximum efficiency.	14 Marks

UNIT-V

9		Explain with a sketch the working of a constant pressure open cycle gas turbine. In what way the actual cycle differs from the theoretical cycle?	14 Marks
		(OR)	
10		Explain using a neat sketch, the principle of operation of turbo jet engine.	14 Marks

CODE No.:14BT50305 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations June – 2022

DESIGN OF MACHINE ELEMENTS-I

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Describe the general considerations in design. 7 Marks

b) Explain the mechanical properties of engineering materials. 7 Marks

(OR)

2 a) Explain the basic modes of failure of mechanical components with examples. 7 Marks

b) Describe the process of selection of engineering materials. 7 Marks

UNIT-II

3 a) Explain Maximum principal shear stress theory under static load condition. 7 Marks

b) Explain Maximum principal strain energy theory under static load condition. 7 Marks

(OR)

4 a) Formulate Soderberg's equation and state its application to different types of loading. 6 Marks

b) A 50mm diameter shaft is made from carbon steel having ultimate tensile strength of 630 MPa. It is subjected to a torque which fluctuates between 2000 N-m to 800 N-m. Using Soderberg method, calculate the factor of safety. Assume suitable values for any other data needed. 8 Marks

UNIT-III

5 A bracket is fixed to the steel column by means of four identical bolts (Fig.1), two at A and two at B. The maximum load that comes on the bracket is 5 kN acting vertically at a distance of 250 mm from the face of the column. The bolts are made of plain carbon steel 30C8 and the factor of safety is 5. Determine the major diameter of the bolts on the basis of maximum principal stress. 14 Marks

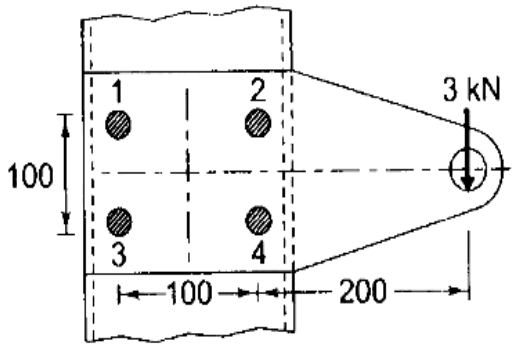


Fig.1

(OR)

6 a) Discuss various ways in which a riveted joint may fail. 6 Marks

b) Two plates of 10 mm thick are joined by means of a single riveted, double strap butt joint. The rivet diameter is 20 mm and pitch of the rivets is 60 mm. The permissible stresses are: σ_t =80 MPa, σ_c = 120 MPa, τ = 60 MPa. Calculate the efficiency of the joint. 8 Marks

UNIT-IV

7 A shaft is supported on two bearings 750 mm apart and transmits 15 kW at 560 r.p.m. A spur pinion of 150 mm diameter is located at 125 mm to the right of the left hand bearing and delivers power horizontally to the right. A spur gear of 500 mm diameter is located at 150 mm to the left of the right hand bearing and receives power from below. Determine the shaft diameter, assuming permissible shear stress for the shaft material as 45 Mpa. 14 Marks

(OR)

8 a) How do you classify shaft couplings? 4 Marks

b) Design a muff coupling for a shaft transmitting 30 kW at 300 r.p.m. The material adopted for shaft is plain carbon steel (SAE 1040) and muff coupling is grey cast iron (FG 200).The key is also made of plain carbon steel . Design torque on the shaft may be taken as 1.15 times the average torque. 10 Marks

UNIT-V

9 a) Distinguish between cotter joint and knuckle joint. 4 Marks

b) Discuss the design procedure of spigot and socket cotter joint. 10 Marks

(OR)

10 Design a knuckle joint to transmit 150 kN. The design stresses may be taken as 75 MPa in tension, 60 MPa in shear and 150 MPa in compression. 14 Marks

CODE No.:14BT50405 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations June – 2022

PULSE AND DIGITAL CIRCUITS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define unit-step function, ramp function and impulse function. Show that a pulse is combination of unit-step functions.	5 Marks
	b)	What is meant by linear wave shaping?	3 Marks
	c)	Why a capacitor in a high-pass RC circuit is named as blocking capacitor?	6 Marks
		(OR)	
2	a)	What is meant by piece wise-linear approximation? Draw VI characteristics of junction diode on the basis of above approximation.	8 Marks
	b)	Discuss the breakdown voltage considerations and saturation parameters of transistor.	6 Marks

UNIT-II

3	a)	Define clipper. Explain the clipping using zero diodes.	7 Marks
	b)	Draw a transistor clipper and explain its operation.	7 Marks
		(OR)	
4	a)	Explain the effect of diode characteristics on clamping voltage.	6 Marks
	b)	Analyze the operation of a two level slicer with the aid of transfer characteristics.	8 Marks

UNIT-III

5		Draw and explain the circuit of Collector-Coupled Monostable Multivibrator with necessary waveforms and also derive the expression for pulse width.	14 Marks
		(OR)	
6	a)	Discuss in detail about Transistor switching times with relevant diagrams.	6 Marks
	b)	Design a Collector-Coupled Astable multivibrator with frequency 1KHz, h_{FE} = 50, 1 $_{C(sat)}$= 5mA, $V_{CE(sat)}$= 0.2, V_{cc}=12. Assume $R_1 = R_2$, $C_1=C_2$.	8 Marks

UNIT-IV

7	a)	Describe the generation of sweep signal from an exponential sweep circuit.	6 Marks
	b)	Explain the principle and working of a transistor Miller time-base generator.	8 Marks
		(OR)	
8	a)	Briefly explain the synchronization of sweep circuit with symmetrical signals.	8 Marks
	b)	Explain frequency division in a sweep circuit.	6 Marks

UNIT-V

9	a)	With neat diagram, analyze the working of bidirectional sampling gate using two transistors.	6 Marks
	b)	Discuss the applications of Sampling gates.	8 Marks
		(OR)	
10	a)	Draw and explain the circuit of Two-input TTL NAND gate.	6 Marks
	b)	Implement OR and AND gates using diodes and transistors.	8 Marks

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations June – 2022

LINEAR AND DIGITAL IC APPLICATIONS

[Electrical and Electronics Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What is the need of frequency compensation for an op-amp? Explain Dominant-Pole frequency compensation technique.	7 Marks
	b)	Explain the function of various blocks in block diagram of an op-amp.	7 Marks
		(OR)	
2	a)	Give the design procedure of a compensating network for an op-amp which uses ±10V supply voltages. Assume necessary data.	7 Marks
	b)	Explain ac analysis of differential amplifier.	7 Marks

UNIT-II

3	a)	Explain Current to Voltage converter.	7 Marks
	b)	Design an integrator to integrate a square wave of +/- 5V with a frequency of 3KHz. Draw the input and output waveforms.	7 Marks
		(OR)	
4	a)	Derive the transfer function and magnitude for a low pass first order filter.	7 Marks
	b)	Design a Schmitt trigger for an upper threshold voltage of 4V and lower threshold voltage of -2V for saturated voltages of +/- 14V.	7 Marks

UNIT-III

5	a)	Draw and explain the block diagram of IC566 VCO.	7 Marks
	b)	With a neat sketch, explain the functional diagram of 555 timer in monostable mode.	7 Marks
		(OR)	
6	a)	LSB of a 9-bit DAC is represented by 19.6 mV. If an input of 9 zero bits is represented by 0 volts, i) find the output of the DAC for an input 101101101 and 011011011. ii) what is the Full Scale Reading (FSR) of this DAC?	6 Marks
	b)	Explain any two applications of PLL.	8 Marks

UNIT-IV

7	a)	Explain steady state electrical behavior of CMOS and also explain CMOS-to-TTL interface.	7 Marks
	b)	Compare different logic families and list out their advantages and disadvantages.	7 Marks
		(OR)	
8	a)	What are the parameters that are used to define electrical characteristics of CMOS circuits? Write typical values for a CMOS NOR gate.	7 Marks
	b)	Draw the circuit for CMOS NAND gate, its functional table and symbol and explain its working neatly.	7 Marks

UNIT-V

9	a)	Explain the various language elements in Verilog.	8 Marks
	b)	Write a Verilog program for an active high 3 to 8 decoder.	6 Marks
		(OR)	
10	a)	Explain the structural modeling in Verilog.	8 Marks
	b)	Write a Verilog program for 4:1 multiplexer.	6 Marks

CODE No.: 16BT3HS02 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

MANAGERIAL ECONOMICS AND PRINCIPLES OF ACCOUNTANCY

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	Define Managerial Economics. Explain its nature and scope.		CO1	14 Marks
	(OR)			
2	Explain other things remain the same the quantity demanded increases with every fall in price and vice-versa.		CO1	14 Marks

UNIT-II

3	Define Cost. Explain different types of Costs.		CO3	14 Marks
	(OR)			
4	Determine,	i) BEP ii) Sales required to earn a profit of Rs.40,000 iii) BEP, when fixed cost increases by Rs.10,000 iv) BEP when variable cost increases by Rs.20/unit. Selling Price /unit Rs.200 Variable Cost/unit Rs.50 Fixed Cost Rs.1,00,000	CO2, CO5	14 Marks

UNIT-III

5	Explain Monopoly competition features. Explain price and output determination both in Short run and Long run.		CO3	14 Marks
	(OR)			
6	Define Market. Explain the different types of Market.		CO3	14 Marks

UNIT-IV

7	From the following transactions pass necessary journal entries in the books of Raghava. 2018 Jan. 1 Raghava commenced a business with Rs. 15,00,000. Jan. 6 Bought goods from Harika for cash Rs. 1,04,500. Jan. 17 Bought goods by Suri Rs. 1,48,000 Jan. 21 Commission paid Rs. 3,600. Jan 28 Cash deposited in Bank Rs.10,000 Jan. 31 Salaries paid through cheque Rs. 20,000.		CO2, CO3, CO6	14 Marks
	(OR)			
8	Discuss briefly various sources of capital for a business.		CO1	14 Marks

UNIT-V

9 From the following particulars prepare trading and profit and loss account and balance sheet as on 31.3.2019 of Mr.Rakesh. CO4, CO5, CO6 — 14 Marks

Particulars	Amount
Cash in hand	5,000
Capital	3,00,000
Rent	2,000
Wages	25,600
Office Expenses	15,900
Rates and Taxes	50,900
Salaries	1,12,600
Octroi	5,000
Carriage Inwards	4,400
Carriage outwards	1,400
Purchases	3,72,000
Purchases Returns	2,800
Sales Returns	3,500
Sales	6,64,700
Drawings	8,700
Plant and Machinery	2,70,000
Furniture	15,000
Stock	47,500
Sundry Debtors	80,000
Sundry Creditors	50,000
Discount Received	2,000

Adjustments:

1. Closing Stock Rs.56,000/
2. Depreciate Plant and Machinery by 10% and Furniture by 5%.

(OR)

10 Explain the advantages and disadvantages of computerized accounting. CO1, CO2 — 14 Marks

CODE No.: 16BT5HS01 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

MANAGEMENT SCIENCE

[Computer Science and Engineering, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Henry Fayol's 14 principles of management first published in 1916. Are they useful today as they were then? Why or why not? When are they most and least useful?	CO2	14 Marks

(OR)

2		If you learned that a company had a matrix structure, would you be more or less interested in working there? Explain your answer. How would you prepare yourself to work effectively in a matrix organization?	CO3	14 Marks

UNIT-II

3	a)	Enumerate the factors influencing the plant layout.	CO1	7 Marks
	b)	Explain various channels of distribution.	CO1	7 Marks

(OR)

4	a)	The xyz company purchases a component used in manufacturing automobile generators directly from the supplier. The company's generator production which is operated at a constant rate will need 1,000 components per month throughout the year. If ordering costs are Rs 2,500 per order, unit cost is Rs 3.00 per component and annual inventory holding costs are charged at 20%, answer the following inventory policy questions : i) What is the EOQ for this component? ii) What is the length of cycle time in months? iii) What are the total inventory holding and ordering costs associated with your recommended EOQ?	CO4	7 Marks
	b)	Discuss the key aspects and elements of purchase and stores management.	CO1	7 Marks

UNIT-III

5	a)	The challenge and the role of HRM department being what it is, it is strange its status is not recognized and respected. Place yourself in the role of a HR manager. How would you reverse the trend?	CO1	7 Marks
	b)	Explain any two theories of Motivation.	CO1	7 Marks

(OR)

6		Define the term Job evaluation. Outline the methods of Job evaluation.	CO1	14 Marks

UNIT-IV

7 The activities of a project and their time estimates are given below: CO6 14 Marks

Activity	(Estimated duration of activity (in weeks)		
	Optimistic Time (t_0)	Most likely time(t_m)	Pessimistic time(t_p)
1-2	2	5	8
1-4	4	19	28
1-5	5	11	17
2-3	3	9	27
2-6	3	6	15
3-6	2	5	14
4-6	3	6	15
5-7	1	4	7
5-8	2	5	14
6-8	6	12	30
7-8	2	5	8

i) Draw the PERT network diagram.
ii) Determine the mean time and standard deviation of each activity.
iii) Determine the critical path and the standard deviation for the critical path.
iv) Calculate the slack for the events.
v) Calculate the total float, free float and independent float for each activity.

(OR)

8 Discuss the role and importance of women as an entrepreneur. CO5 14 Marks

UNIT-V

9 Discuss the need for maintenance management. Illustrate various maintenance strategies and explain the techniques of managing work environment. CO5 14 Marks

(OR)

10 a) Differentiate between Total Quality Management (TQM) and Six Sigma concepts. CO6 7 Marks

b) Describe the steps involved in Material requirement planning. CO1 7 Marks

CODE No.: 16BT5HS02 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

COSTING AND FINANCING MANAGEMENT FOR CIVIL ENGINEERS

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	Write down the procedure involved in cost estimating.	CO2	14 Marks

(OR)

2	Write down the importance of preliminary estimates and detailed estimates.	CO4	14 Marks

UNIT-II

3	The following was the expenditure on a contract for Rs.8,00,000 commenced in January 2018: Materials Rs. 1,50,000. Wages Rs. 1,64,000. Plant Rs. 22,000. Business Charges Rs. 9,400. Cash received on account to December, 2018 amounted to 2,80,000 being 85% of work certified. The value of materials in hand as on 31-12-2018 was Rs.15,000. Prepare the Contract Account for 2018 showing the profit to be credited to the year's Profit and Loss Account. Plant is to be depreciated at 10%.	CO4	14 Marks

(OR)

4	Define Contract Costing. List out the costs not attributable to contract account.	CO1	14 Marks

UNIT-III

5	Write down the objectives and principles of Good Budgetary Control.	CO3	14 Marks

(OR)

6	Define Budget. Write down the characteristics of Budget.	CO4	14 Marks

UNIT-IV

7	Write a short note on Non-discounted Cash Flow techniques.	CO2	14 Marks

(OR)

8	"Capital budgeting decisions are irreversible". Justify?	CO4	14 Marks

UNIT-V

9	Discuss in brief about Cash Conversions cycle.	CO1	14 Marks

(OR)

10	Write a short note on Trade Credit and its benefits.	CO4	14 Marks

❀ ❀ ❀

CODE No.: 16BT30503 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

PYTHON PROGRAMMING
[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Write notes on Python Standard Library.	CO1	7 Marks
	b)	Write a Python program that allows the user to enter two integer values and displays the results when each of the following arithmetic operators is applied. For example, if the user enters the values 7 and 5, the output would be, 7 + 5 = 12 7 - 5 = 2 7 * 5 = 35 7 / 5 = 1.40 7 // 5 = 1 7%5 = 2 7 ** 5 = 16,807 All floating-point results should be displayed with two decimal places of accuracy. In addition, all values should be displayed with commas where appropriate.	CO1	7 Marks

(OR)

2	a)	Algorithms and computers are a "perfect match". Justify.	CO2	6 Marks
	b)	List and describe the capabilities an Integrated Development Environment (IDE) should provide.	CO1	8 Marks

UNIT-II

3	a)	Illustrate selection and iterative control statements with suitable examples.	CO1	8 Marks
	b)	Write a program that sums a series of (positive) integers entered by the user, excluding all numbers that are greater than 100.	CO1	6 Marks

(OR)

4	a)	Write a Python program that prompts the user to enter types of fruit and how many pounds of fruit there are for each type. The program should then display the information in the form fruit, weight listed in alphabetical order, one fruit type per line as shown below, Apple, 6 lbs. Banana, 11 lbs. etc.	CO3, CO4, CO5	7 Marks
	b)	Give a program segment that creates an initially empty dictionary named password_lookup, prompt-ing one-by-one for usernames and passwords (until a username of 'z' is read) entering each into the dictionary.	CO3, CO5	7 Marks

UNIT-III

5		Briefly describe the following types of function arguments: i) Actual Arguments ***vs.*** Formal Parameters. ii) Mutable ***vs.*** Immutable Arguments. iii) Keyword Arguments ***vs*** Default Arguments	CO2	14 Marks

(OR)

6	a)	Elaborate on Merge Sort Recursive algorithm.	CO1	7 Marks
	b)	Explain the fundamental operations on text files.	CO4. CO5	7 Marks

UNIT-IV

7	a)	What is meant by inheritance? Describe the use of inheritance in Python by considering appropriate examples.	CO3	10 Marks
	b)	Describe what it means for a member of a class to be private.	CO3	4 Marks

(OR)

8	a)	Give a set of instructions for controlling the turtle to draw a line from the top-left corner of the screen to the bottom-right corner, and from the top-right corner to the bottom-left corner, thereby making a big X on the screen. There should be no other lines drawn on the screen.	CO5	7 Marks
	b)	Give a set of instructions that moves the turtle with an actual turtle shape from the bottom of the screen toward the top, changing its fill color when it crosses the x axis of the grid coordinates.	CO5	7 Marks

UNIT-V

9	a)	Briefly discuss tkinter Extensions.	CO5	8 Marks
	b)	Justify how tkinter's accessibility, portability and availability have made it the most widely used Python GUI solution.	CO5	6 Marks

(OR)

10		Write short notes on the following callback handlers. i) Lambda Callback Handlers. ii) Callable Class Object.	CO5	14 Marks

CODE No.:16BT40406 SVEC16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC16) Regular/Supplementary Examinations February – 2021

PULSE AND DIGITAL CIRCUITS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Describe the operation of RC High Pass Circuit when it is excited by Ramp input with aid of neat sketches.	CO1	7 Marks
	b)	Apply appropriate technique on a simple RC Circuit to convert a square wave to periodical ramp signal.	CO5	7 Marks
		(OR)		
2.	a)	Obtain the response of RC High Pass Circuit for a square wave input for different Time Constants and evaluate % Tilt.	CO1	8 Marks
	b)	Justify how a Low-pass RC circuit acts as an Integrator.	CO2	6 Marks

UNIT-II

3.	a)	What is synchronized clamping?	CO2	7 Marks
	b)	State and prove clamping circuit theorem.	CO1	7 Marks
		(OR)		
4.	a)	In a clamping circuit, for symmetrical square wave Asses the parameters of ratio of area in forward direction to area in reverse direction in terms of forward resistance R_f to reverse resistance R_r .	CO6	8 Marks
	b)	Explain the operation of a biased negative clamper with neat sketch.	CO1	6 Marks

UNIT-III

5.	a)	Design a collector-coupled monostable multivibrator with a gate width of 5ms using n-p-n silicon transistors.	CO3	8 Marks
	b)	With the help of neat diagrams, discuss the different methods of triggering a binary.	CO1	6 Marks
		(OR)		
6.	a)	Sketch and explain the operation of a Fixed-bias Bi-stable Multivibrator with relevant waveforms.	CO1	7 Marks
	b)	Apply appropriate multi-vibrating technique to convert voltage into frequency using two transistors.	CO5	7 Marks

UNIT-IV

7.	a)	Draw and explain the circuit diagram of transistor Miller time-base generator.	CO1	8 Marks
	b)	Compare the voltage and current time base generators with some examples.	CO3	6 Marks
		(OR)		
8.	a)	Explain the basic principles of Bootstrap Time-base generator.	CO1	6 Marks
	b)	Explain the principle and working of a Transistor Current Time-Base generator.	CO1	8 Marks

UNIT-V

9.	a)	Implement NOR gate using CMOS logic.	CO1	7 Marks
	b)	Explain the operation of TTL logic family.	CO1	7 Marks
		(OR)		
10.	a)	Draw and explain the operation of Bidirectional sampling gate.	CO1	7 Marks
	b)	Draw and explain the operation of ECL NOR/OR circuit.	CO1	7 Marks

CODE No.: 16BT40502 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

DATABASE MANAGEMENT SYSTEMS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Compare conventional file processing with traditional database system.	CO1	8 Marks
	b)	Explain about different users of database system.	CO2	6 Marks
		(OR)		
2		Discuss in detail about the concepts of E-R model. Draw E-R diagram for Hospital Management system.	CO2	14 Marks

UNIT-II

3	a)	Describe integrity constraints used in relational database system.	CO4	8 Marks
	b)	What is a view? How views are implemented?	CO1	6 Marks
		(OR)		
4	a)	List and explain various operations of Relational Algebra with suitable examples.	CO2	10 Marks
	b)	Differentiate DRC and TRC.	CO3	4 Marks

UNIT-III

5	a)	Write the basic structure of SQL. Explain about Group functions used in it with examples.	CO1	8 Marks
	b)	List and explain the common data types available in SQL.	CO1	6 Marks
		(OR)		
6	a)	What is Closure set of Functional Dependency? Explain its concept.	CO2	6 Marks
	b)	Differentiate 2NF and 3NF with suitable examples.	CO1	8 Marks

UNIT-IV

7	a)	What is a transaction? Explain its operations.	CO1	7 Marks
	b)	Explain the concept of serializability test.	CO4	7 Marks
		(OR)		
8	a)	Explain the concept of locking mechanism. State and explain two-phase locking protocol.	CO2	7 Marks
	b)	Discuss about various deadlock handling methods.	CO1	7 Marks

UNIT-V

9		Write short notes on: i) Hash based indexing. ii) B-trees.	CO4	14 Marks
		(OR)		
10	a)	Explain in detail about indexed sequential access method.	CO2	7 Marks
	b)	Explain B-tree index files.	CO6	7 Marks

CODE No.: 16BT41204 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

THEORY OF COMPUTATION

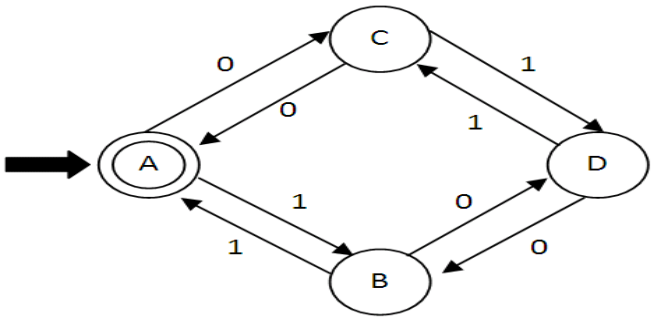
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What is a Finite State Machine (FSM)? Give the Mathematical representation of FSM. Explain each component.	CO1	7 Marks
	b)	Discuss the words W in the language L accepted by the automaton in the figure.	CO2	7 Marks



(OR)

2	a)	What is NFA? Obtain the equivalent DFA for following finite automata with **ε** transitions.	CO2	7 Marks

	0	1
a	a, b	a-
b	-	c
c	C	c

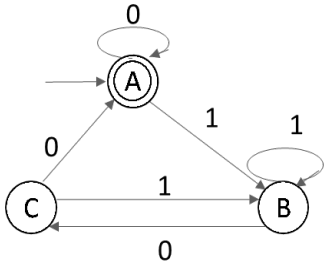
	b)	Construct a FA accepting all strings over {a, b} ending in aba or aaba.	CO3	7 Marks

UNIT-II

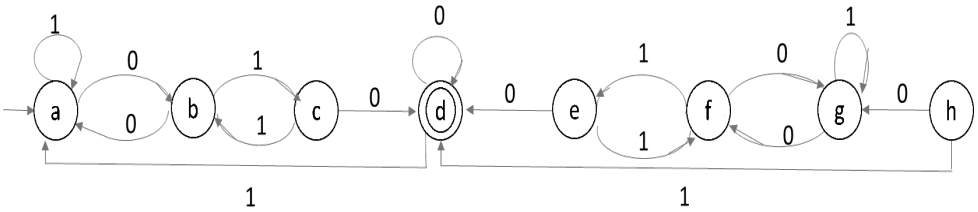
3	a)	Show that the following language is not regular L = { a^P| P is Prime }.	CO5	7 Marks
	b)	How can we say that 2 DFA's are equivalent? Explain with help of an example.	CO1	7 Marks

(OR)

4	a)	Construct regular expression corresponding to the finite state diagram.	CO3	7 Marks



	b)	Minimize the following finite automata.	CO3	7 Marks



UNIT-III

5	a)	Explain the applications of CFG's.	CO1	7 Marks
	b)	Find the Parse tree for the expression **abbcde**, considering the productions $S \rightarrow aACBe$, $A \rightarrow Ab$, $A \rightarrow b$, $B \rightarrow d$.	CO4	7 Marks

(OR)

6	a)	State and prove pumping Lemma for Context Free Languages.	CO5	7 Marks
	b)	Convert the following grammar in to GNF. $S \rightarrow XA \mid BB$, $B \rightarrow b \mid SB$, $X \rightarrow b$.	CO3	7 Marks

UNIT-IV

7	a)	Discuss Chomsky hierarchy of Languages.	CO1	5 Marks
	b)	Design a NPDA that accepts the language $L = \{ a^n b^n : n \geq 0 \} \cup \{ a \}$.	CO3	9 Marks

(OR)

8	a)	Discuss about the model of linear bounded automaton.	CO1	6 Marks
	b)	Obtain a PDA to accept a string of balanced parentheses. The parentheses to be considered are (,), [,], { and }.	CO3	8 Marks

UNIT-V

9	a)	Construct a turning machine that computes 1's complement of a binary number.	CO4	7 Marks
	b)	State and explain the un-decidability of post correspondence problem.	CO1	7 Marks

(OR)

10	a)	List about multiple Turing Machines.	CO1	7 Marks
	b)	Distinguish between PCP and MPCP. What are the concepts used in UTM's?	CO1	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

IRRIGATION ENGINEERING

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain in detail about various factors affecting Duty.	CO1	7 Marks
	b)	Describe with neat sketches about different methods of applying water to the field.	CO2	7 Marks
		(OR)		
2	a)	Define Duty and Delta and derive the relationship between them.	CO2	7 Marks
	b)	Explain sprinkler irrigation with neat sketch and also mention its advantages over conventional methods.	CO1	7 Marks

UNIT-II

3	a)	Sketch the layout of a diversion head work and also explain the functions of various components.	CO1	7 Marks
	b)	Explain Khosla's theory of seepage below a weir with neat diagram.	CO2	7 Marks
		(OR)		
4	a)	Classify different types of diversion head works and also give examples for them.	CO1	7 Marks
	b)	Write step by step design procedure of impervious floor below the weir and also discuss about Exit gradient.	CO4	7 Marks

UNIT-III

5	a)	Distinguish between elementary and practical profile of gravity dam.	CO2	7 Marks
	b)	Discuss different types of spillways with neat sketches.	CO1	7 Marks
		(OR)		
6	a)	Discuss various seepage control measures to be adopted in Earth dam.	CO1	7 Marks
	b)	Check the stability of gravity dam of trapezoidal shape having the top width 5m and bottom width 35m and height of the dam 50m with vertical u/s face. The free board is 5m. Consider Hydro static pressure due to u/s water only, Uplift pressure and Earth quake forces. Consider both Horizontal and vertical earthquake acceleration coefficient as 0.1.	CO6	7 Marks

UNIT-IV

7	a)	Classify canal falls and explain the suitability of location of falls.	CO1	7 Marks
	b)	Discuss about various canal regulation works.	CO2	7 Marks
		(OR)		
8	a)	Describe the classification of canals.	CO2	7 Marks
	b)	Design an irrigation channel to carry a discharge of $45m^3$/sec. Assume N=0.0225, critical velocity ratio (m) =1 and the channel has a bed slope of 0.16m/km.	CO3	7 Marks

UNIT-V

9	a)	Explain various types of Aqueducts with neat sketches and mention criteria for their suitability.	CO1	7 Marks
	b)	Explain the design principles of siphon aqueduct.	CO3	7 Marks
		(OR)		
10	a)	Explain various types of cross-drainage works with neat sketches.	CO2	7 Marks
	b)	Discuss the necessity of river training works.	CO1	7 Marks

CODE No.: 16BT50102 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

REINFOCED CEMENT CONCRETE STRUCTURES

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the differences between working stress method and limit state method	CO1	5 Marks
	b)	Explain the stress block parameters with neat sketches.	CO1	5 Marks
	c)	Define partial safety factors of load and material. Write the expressions to determine the design load and design strength of the material from their respective characteristic values employing the corresponding partial safety factors.	CO1	4 Marks
		(OR)		
2	a)	A rectangular reinforced concrete section having a breadth of 350mm is reinforced with 2 bars of 28mm and two bars of 25mm diameters at an effective depth of 700mm adopting M-20 grade concrete and Fe-415 HYSD bars. Determine the ultimate moment of resistance of the section.	CO3	7 Marks
	b)	Determine the area of the tensile reinforcement required in flanged beam having the flowing sectional dimensions to support the factored moment 275kN-m. Width of the Flange (b_f) - 750mm, width of the rib (b_w) – 300mm, thickness of the flange (D_f) - 120mm, effective depth (d)-600mm. Use M-20 grade concrete and Fe-415 HYSD bars.	CO3	7 Marks

UNIT-II

3	a)	Explain the shear reinforcement, main steel and hanger bars with neat sketch.	CO1	5 Marks
	b)	What is characteristic strength of materials and how to calculate design strength?	CO1	5 Marks
	c)	Explain limit state of collapse and limit state of serviceability.	CO1	4 Marks
		(OR)		
4		Design an L-beam for an office room floor to suit the following data: Clear span – 6m, Center to center of supports – 6.3m, The L – beam is monolithic with R.C, Columns, Spacing of beams – 2.75m c/c, Loading (office floor) - 4kN/m^2, Thickness of slab – 100mm, Width of columns -300 mm, use M-20 grade of concrete and Fe-415 HYSD bars.	CO3	14 Marks

UNIT-III

5	a)	What are the limitations for longitudinal reinforcement and transverse reinforcement in slabs as per IS code.	CO1	5 Marks
	b)	Represent IS code recommendations of torsion steel in slabs.	CO1	5 Marks
	c)	When and where is torsion reinforcement provided in slab?	CO1	4 Marks
		(OR)		
6		Design a two-way slab for a room of size 4m by 5m with dimensions and simply supported edges on all the sides with corners prevented from lifting to support a live load of 4 kN/m^2. Adopt M-20 grade concrete and Fe-415 grade HYSD bears.	CO3	14 Marks

UNIT-IV

7	a)	Define pedestal, short column and long column.	CO1	5 Marks
	b)	How will you calculate the slenderness ratio of a column?	CO1	5 Marks
	b)	Discuss about braced and un-braced columns.	CO5	4 Marks

(OR)

8		Design the reinforcement in a rectangular column of size 300mm x 500mm to support a design ultimate load of 500 KN, together with a factored moment of 200 KN-m. Adopt M-20 grade concrete and Fe-415 grade HYSD bears. Sketch the details of reinforcement. Use SP-16 chart.	CO3	14 Marks

UNIT-V

9	a)	What are the two essential requirements in design of foundation	CO1	5 Marks
	b)	Explain types of stair cases with neat sketches.	CO1	5 Marks
	c)	What is punching shear? Explain punching in footings.	CO7	4 Marks

(OR)

10		Design an isolated square sloped footing for a square column of size 450mm x 450mm. for an axial factored load of 1600 KN. Use M-20 concrete and Fe-415 steel. The S.B.C of soil is 200 kN/m^2.	CO3	14 Marks

CODE No.: 16BT50103 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

SOIL MECHANICS

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	If the water content of a fully saturated soil mass is 100%, what will be the relation between void ratio and specific gravity of soil?	CO3	6 Marks
	b)	The water content of saturated soil and the specific gravity of soil solids were found to be 30% and 2.70 respectively. Assuming that the unit weight of water to be 10 kN/m^3, what are the saturated unit weight and void ratio?	CO2	8 Marks
		(OR)		
2	a)	What will be the Relative density of soil, if soil is having maximum dry density of 2, minimum dry density of 1.2 and normal dry density of 1.6?	CO2	5 Marks
	b)	Sieve analysis on a dry soil sample of mass 1000 g showed that 980 g and 270 g of soil pass through 4.75 mm and 0.075 mm sieve respectively. The liquid limit and plastic limit of soil fraction passing through 425 micron sieve are 40% and 18% respectively. Classify the soil as per IS1478:1970.	CO8	9 Marks

UNIT-II

3	a)	A soil has a discharge velocity of 3 x 10^{-7} m/s and void ratio of 0.5. What is the seepage velocity?	CO2	6 Marks
	b)	If flow net of a cofferdam foundation had 6 numbers of flow channels and 12 numbers of equi-potential drops with a head of water lost during seepage being 6m through the foundation having k = 4 x 10^{-5} m/minute, then what will be the seepage loss (in m^3/day) per meter length of dam?	CO2	8 Marks
		(OR)		
4	a)	Illustrate the method of determination of coefficient of permeability of cohesion less soils.	CO4	6 Marks
	b)	If during a permeability test on a soil sample with a falling head permeameter equal time intervals are noted for a drop of head from L_1 and L_2 and against L_2 and L_3, what will be the relation between L_1, L_2 and L_3?	CO2	8 Marks

UNIT-III

5	a)	What is Newmark's Chart? How is it helpful in computing the vertical stress at any depth due to a loaded area?	CO1	7 Marks
	b)	Determine the vertical stress intensity at a point 3m below the ground level and 2.5m away from the line of action of a vertical point load of 150kN acting on the ground surface by Boussinesq's method.	CO2	7 Marks
		(OR)		
6	a)	What are the factors affecting the compaction of soils and explain them?	CO1	6 Marks
	b)	A natural soil deposit has a bulk unit weight of 20kN/m^3 and water content of 5%. Estimate the amount of water (in litres) required to be added to 1m^3 of soil to raise the water content to 20%. Assume the void ratio to remain constant. Take specific gravity of soil solids as 2.7.	CO3	8 Marks

UNIT-IV

7	a)	In a consolidation test the following results have been obtained. When the load was changed from 50kN/m^2 to 100kN/m^2, the void ratio changed from 0.70 to 0.65. Determine the coefficient of volume decrease and the compression index.	CO3	6 Marks
	b)	Find the settlement due to consolidation in a 3m x 3m column foundation with a load of 270kN. The foundation is placed 1m below the ground surface and the clay layer is 9m thick. There is a sand layer underneath the clay layer. The density of the clay layer is 18kN/m^3, the compression index C_c of the clay layer is 0.32, the recompression index C_r is 0.035, the pre-consolidation pressure (P_c) is 92kN/m^2 and the initial void ratio e_0 of clay is 0.80. Assume that the pressure is distributed at a 2:1 ratio and the clay is normally consolidated.	CO7	8 Marks

(OR)

8	a)	What are the various assumptions and limitations of Terzaghi's one dimensional consolidation theory?	CO1	6 Marks
	b)	There is a bed of compressible clay of 4m thickness with pervious sand on top and impervious rock at the bottom. In a consolidation test in the laboratory on an undisturbed specimen of clay from this deposit 90% settlement was reached in 4 hours. The specimen was 20mm thick. Estimate the time in years for the building founded over this deposit to reach 90% of its final settlement.	CO2	8 Marks

UNIT-V

9	a)	Classify triaxial tests from the point of view of drainage characteristics. Briefly describe the essential features of each.	CO3	6 Marks
	b)	Two undrained triaxial tests were conducted on soil specimens and they gave the following results. Confining pressure (kg/m^2) : 150 300 Failure load (kg/m^2) : 500 800 Determine the value of apparent cohesion and friction of the soil.	CO2	8 Marks

(OR)

10	a)	Discuss the advantages of triaxial tests over direct shear test.	CO2	6 Marks
	b)	The principal stresses at a point in a material are 100kN/m^2 and 50kN/m^2. Determine the Normal, Shear and Resultant Stress on a plane inclined at 35^0 to the major principal plane. Also find the maximum value of Obliquity for this plane.	CO2	8 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

STRUCTURAL ANALYSIS – II

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Derive the expression for maximum bending moment and shear force for a simply supported beam with a UDL moving from left to right.	CO1	6 Marks
	b)	For a simply supported beam AB of 4m with an overhang of 2m, plot the influence lines for reactions at A, shear force at D 2m away from left support A and bending moment at D. Using the influence line diagrams, determine the value of the above stress functions due to an UDL of 20kN/m covering the entire span.	CO2	8 Marks

(OR)

2	a)	An UDL of 50 kN/m of 6m length crosses a girder of span 40m left to right with the help of influence lines. Determine the values of shear force, bending moment at 12 m from the left support when the head of the load is 6m from the left support.	CO2	6 Marks
	b)	An UDL of 40kN/m and length of 3m traverse across the simply supported length of 18m.Compute the maximum bending moment at 4m from the left support and absolute bending moment using influence lines.	CO2	8 Marks

UNIT-II

3		Analyze the two–span continuous beam shown in Figure 1 by slope deflection method and draw the bending moment and shear force diagrams.	CO6	14 Marks

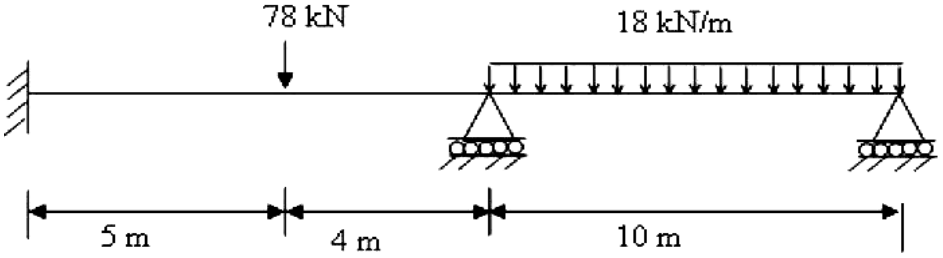
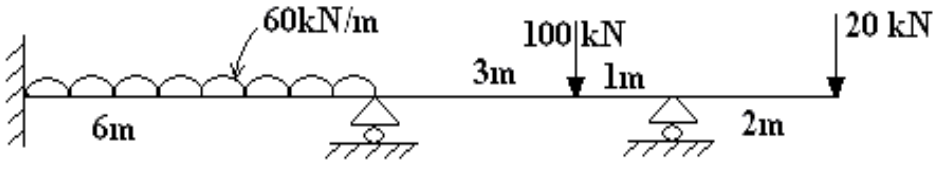


Figure 1

(OR)

4		Analyze the continuous beam shown in Figure 2 by using moment distribution method and draw the bending moment diagram.	CO6	14 Marks



EI is constant

Figure 2

UNIT-III

5	a)	Derive the expression for strain energy due to axial load.	CO1	7 Marks
	b)	Determine the deflection of the free end of a cantilever of length 'L' subjected to a concentrated load 'P' at the end using strain energy method.	CO2	7 Marks

(OR)

6		Analyze the continuous beam shown in Figure 3 by Kani's method.	CO4	14 Marks

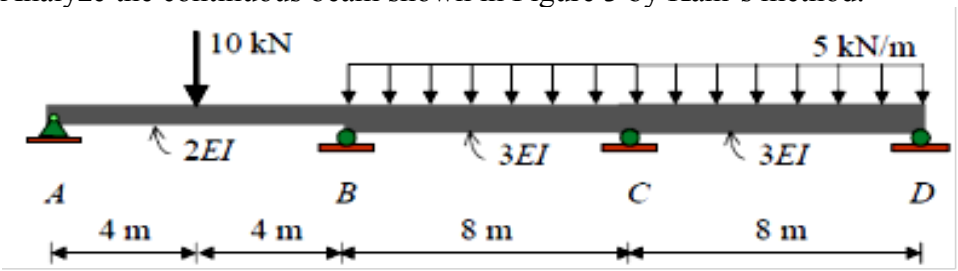


Figure 3

UNIT-IV

7		Explain the following: i) How many unknown reactive forces for a hinge, roller and fixed support with an example? ii) Give examples for statically determinate and statically indeterminate beams. iii) How many methods are available to analyze the statically indeterminate structures with an example?	CO5	14 Marks

(OR)

8		Analyze the truss shown in Figure 4 below by Castigliano's theorem. Area of cross section of members in mm^2 is shown in Figure 4. E is constant throughout.	CO4	14 Marks

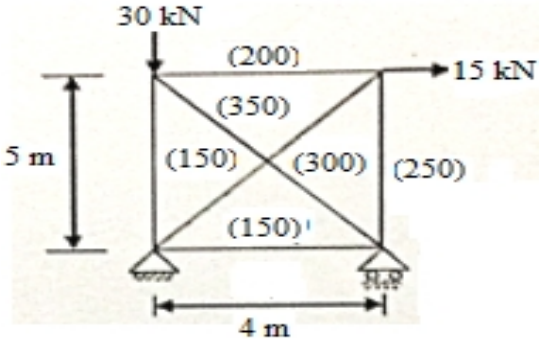


Figure 4

UNIT-V

9	a)	Define plastic hinge and shape factor.	CO1	7 Marks
	b)	Determine the collapse load of a continuous beam shown in Figure 5.	CO3	7 Marks

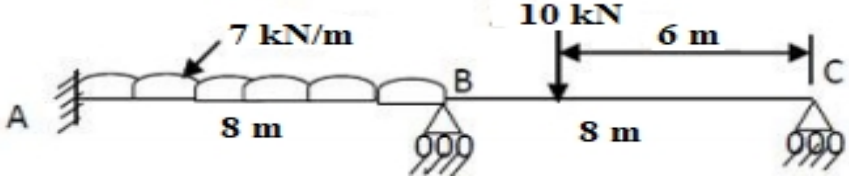


Figure 5

(OR)

10		Calculate the plastic moment capacity required for the continuous beam with working loads shown in Figure 6.	CO3	14 Marks

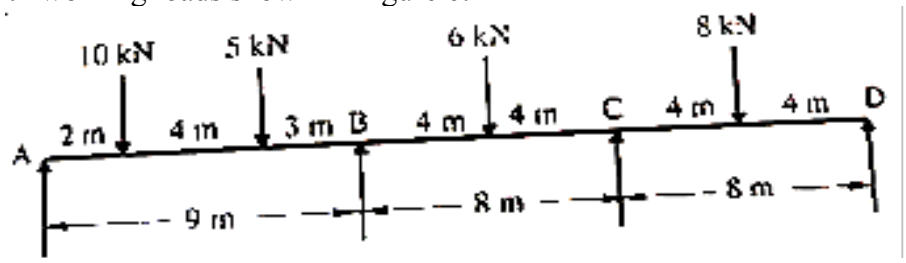


Figure 6

CODE No.: 16BT50105 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

WASTE WATER TECHNOLOGY
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Describe the systems of sewerage. CO1 7 Marks

b) The drainage area of one sector of a town is 20 hectares, population 50,000 and rate of water supply 200lpcd. The classification of the surface of this area is as follows. CO3 7 Marks

Percentage of total surface area	Type of Surface area	Coefficient of runoff
20	Hard pavement	0.85
20	Roof surface	0.80
15	Un paved street	0.20
30	Garden and lawn	0.20
Balance	Wooden area	0.15

If the time of concentration for the area is 15minutes, find the maximum quantity of sewage from sector.

(OR)

2 a) Design a sewer to serve a population of 1 lakhs. The daily per capita water supply allowance being 150 liters of which 80% finds its way into the sewer. The slope available for the sewer to be laid is 1 in 700 and the sewer should be designed to carry 2.5 times the dry weather flow when running full. CO3 7 Marks

b) Write short notes on the following. CO1 7 Marks

i) Drop man holes. ii) Lamp holes. iii) Flushing tanks.

UNIT-II

3 a) What is BOD? Derive an expression for the first stage BOD. CO2 7 Marks

b) What do you understand by population equivalent? How do you determine it? CO2 4 Marks

c) A 2% solution of a sewage sample is incubated for 5 days at 20°C. The depletion of oxygen was found to be 4 p.p.m. Determine the BOD of the sewage. CO2 3 Marks

(OR)

4 a) Draw and describe the conventional treatment process flow diagram of municipal wastewater treatment plant. CO7 7 Marks

b) Design a grit chamber for a maximum wastewater flow of 10 MLD, to remove particles up to 0.2 mm diameter having specific gravity 2.65. The kinematic viscosity of water is 1.141×10^{-6} m^2/s at 15°C. CO3 7 Marks

UNIT-III

5	a)	What are the factors affecting biological treatment systems?	CO5	4 Marks
	b)	Write the organic loading parameters of activated sludge process.	CO5	3 Marks
	c)	Design the activated sludge units for the following data: i) Population served = 50,000 ii) Average sewage flow = 180 lpcd iii) BOD of raw sewage = 200 mg/l iv) Raw sewage suspended solids = 300 mg/l v) BOD removal in primary treatment = 35% vi) Overall BOD reduction desired = 80%	CO3	7 Marks

(OR)

6	a)	Explain the functioning of oxidation of pond with a neat sketch.	CO4	7 Marks
	b)	The effluent from a primary settling tank is applied to a standard rate filter at the rate of 3 MLD, having a BOD of 175 mg/l. Determine the depth and volume of filter. Adopting surface loading of 2000 l/m^2/day and an organic loading of 150 g/m^3/day. Also determine the efficiency of such filter unit.	CO3	7 Marks

UNIT-IV

7	a)	Explain anaerobic sludge digestion process and the factors influencing it.	CO1	7 Marks
	b)	What is sludge condition and dewatering? Explain the methods of sludge dewatering.	CO1	7 Marks

(OR)

8	a)	What is nitrification and denitrification? Explain the biological process of denitrification in the removal of organic nitrogen from wastewater.	CO2	7 Marks
	b)	What is Rotating Biological Contactor? Explain the working principle of Rotating Biological Contactor.	CO2	7 Marks

UNIT-V

9	a)	Explain the self purification of streams with the help of oxygen sag curve. Also enlist various factors affecting self purification.	CO1	7 Marks
	b)	Derive streeter-phelps equation.	CO2	7 Marks

(OR)

10	a)	What is sewage farming? What are its advantages over the method of disposal of sewage by dilution?	CO1	7 Marks
	b)	Explain the septic tank effluent disposal methods.	CO4	7 Marks

CODE No.: 16BT50201 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

CONTROL SYSTEMS

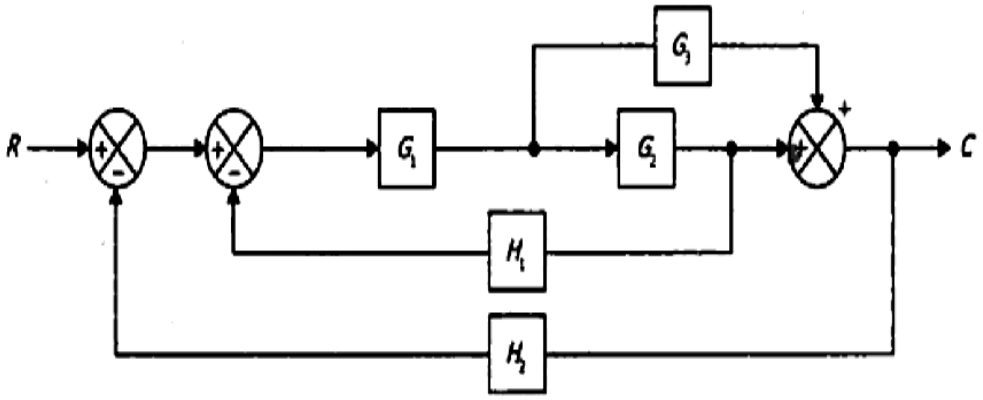
[Electrical and Electronics Engineering, Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks

UNIT-I

1	a)	Describe Masson's gain formulae. List out the advantages and disadvantages of signal flow graph.	CO1	6 Marks
	b)	Determine the transfer function of the system using block diagram reduction rules.	CO4	8 Marks



(OR)

2	a)	Briefly describe the effect of feedback on parameters like gain, sensitivity and stability.	CO1	7 Marks
	b)	Derive the transfer function of armature controlled DC motor and draw the block diagram.	CO4	7 Marks

UNIT-II

3	a)	Derive the expression for time response of second order under damped system for unit step input and also draw the response curve.	CO2	6 Marks
	b)	The open loop transfer function of a unity feedback system is $G(s) = \frac{10}{s(s+4)}$. Determine the nature of response of the closed loop system for a unit step input. Also determine the rise time, peak time, peak overshoot and settling time.	CO4	8 Marks

(OR)

4	a)	Sketch the complete root locus for a system with an open loop transfer function $G(s)H(s) = \frac{K}{S^2+2S+2}$.	CO4	10 Marks
	b)	Briefly explain the difficulties in Routh-Hurwitz criterion and how to overcome.	CO1	4 Marks

UNIT-III

5	a)	Derive the expressions for Resonant peak ,Resonant frequency and Bandwidth in frequency domain analysis	CO1	6 Marks
	b)	Sketch the Nyquist plot and determine the stability of the closed loop system, whose open loop transfer function is given by $G(s)H(s) = \frac{K}{S(S^2+2S+6)}$.	CO5	8 Marks

(OR)

6		Draw the Bode plot for the transfer function $G(s) = \frac{16(1+0.5S)}{S^2(1+0.125S)(1+0.1S)}$. From graph determine: i) Gain cross over frequency. ii) Phase cross over frequency. iii) Gain Margin and Phase Margin. iv) Stability of the system.	CO5	14 Marks

UNIT-IV

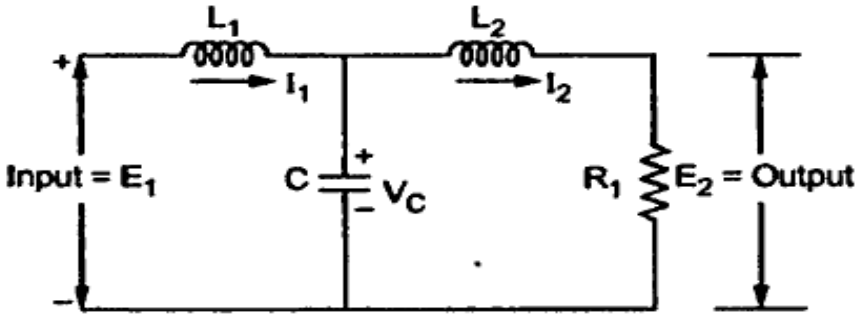
7	a)	What is compensator? Explain the design procedure for a lead compensator.	CO1	7 Marks
	b)	Derive the transfer function of PI controller and also explain how it affects steady state error in second order under damped system when subjected to unit ramp input.	CO6	7 Marks

(OR)

8		The open loop transfer function of a unity feedback system is $G(s) = \frac{K}{s^2(1+0.2s)}$. Design suitable compensator to meet the following specifications. i) Acceleration error constant K_a=10 ii) Phase Margin =30^0.	CO3	14 Marks

UNIT-V

9	a)	Differentiate the state variable approach with transfer function approach for modeling of control systems.	CO2	7 Marks
	b)	Obtain the state model of a given electrical system.	CO2	7 Marks



(OR)

10	a)	What is state transition matrix? Give the properties of state transition matrix.	CO1	7 Marks
	b)	Determine the complete controllability and complete observability of the system with $\dot{X} = AX + BU, Y = CX$. Where $A = \begin{bmatrix} 0 & 1 \\ -1 & -3 \end{bmatrix}, B = \begin{bmatrix} 1 \\ 2 \end{bmatrix}, C = \begin{bmatrix} 1 & 1 \end{bmatrix}$	CO4	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

POWER ELECTRONICS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Draw and explain switching or dynamic characteristics of a thyristor during its turn-on and turn-off processes.	CO1	7 Marks
	b)	Explain the different turn-on methods of SCR.	CO1	7 Marks
		(OR)		
2	a)	A thyristor is made up of a number of SCRs connected in series and parallel. The string has voltage and current ratings of 12KV and 5KA respectively. The voltage and current ratings of available SCRs are 1900Vand 1200A respectively. For a string efficiency of 95%, calculate the number of series and parallel connected SCRs.	CO1, CO4	7 Marks
	b)	Explain what are the methods used to protect an SCR from di/dt and over current.	CO1	7 Marks

UNIT-II

3	a)	Explain the operation of single phase fully controlled bridge type rectifier with R- load and derive for average output voltage.	CO2, CO4	7 Marks
	b)	Explain effects of freewheeling diode.	CO2	7 Marks
		(OR)		
4	a)	What is the effect of source inductance on the performance of 1-Φ fully controlled converter? Discuss with neat sketches.	CO2	7 Marks
	b)	Explain the operation of three phase half controlled bridge converter with RL- load with neat sketches.	CO2	7 Marks

UNIT-III

5	a)	Explain the different modes of operation of 3-Φ dual converter.	CO2	7 Marks
	b)	With neat sketch, explain single phase AC voltage controller for R-load. Derive RMS load voltage and current.	CO2	7 Marks
		(OR)		
6	a)	Explain the working of a single phase bridge type cyclo-converter for RL- load of frequency $f_0 = \frac{1}{4} f_s$ with continuous conduction mode.	CO2	10 Marks
	b)	What are the applications of cyclo-converters?	CO2, CO5	4 Marks

UNIT-IV

7	a)	Explain about step-down chopper and derive the output voltage equation.	CO2	7 Marks
	b)	A step up chopper has input voltage of 220V and output voltage of 660V. If the non-conducting time of thyristor is 100μs, compute the pulse width of the output voltage.	CO2, CO4	7 Marks

(OR)

8	a)	Discuss the differences between natural and forced commutation techniques.	CO3	6 Marks
	b)	Describe Morgan Chopper with associated waveforms.	CO2	8 Marks

UNIT-V

9	a)	Explain the operation of single phase half bridge inverter with aid of relevant waveforms	CO2, CO3	7 Marks
	b)	Explain the operation of basic series inverter.	CO2, CO3	7 Marks

(OR)

10		Explain the principle of operation of three phase inverter with 120^0 conduction mode with necessary wave forms and circuit.	CO3	14 Marks

CODE No.: 16BT50203 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

SYNCHRONOUS MACHINES

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks

UNIT-I

1	a)	Derive the EMF equation of an alternator. Discuss the effects of pitch factor and distributed factor on generated voltage.	CO1	6 Marks
	b)	A 3-phase, star connected alternator has the following data: Voltage required to be generated on open circuit is 4000V at 50Hz, speed=500 r.p.m, stator slots/pole/phase=3, conductors/slot = 12. Find: i) The number of poles. ii) Useful flux per pole.	CO4	8 Marks

(OR)

2	a)	Explain the constructional details of salient pole synchronous machine with a neat sketch.	CO1	7 Marks
	b)	A 3-phase, 16 pole alternator has the following data: Number of slots=192, conductors/slot=8, coil span=160 electrical degrees, speed=375 r.p.m, flux/pole = 55mwb. Calculate the phase and line voltages.	CO4	7 Marks

UNIT-II

3	a)	What is voltage regulation? Discuss the synchronous impedance method of calculating the voltage regulation of alternator.	CO2	6 Marks
	b)	A 30KVA, 440V, 50Hz, 3-phase, star connected synchronous generator gave the following data:	CO4	8 Marks

Field current (A):	2	4	6	7	8	10	12	14
O.C.Voltage(V):	155	287	395	440	475	530	570	592
S.C.Current(A)	11	22	34	40	46	57	69	80

Resistance between terminals is 0.3Ω. Find regulation at full load 0.8 p.f lagging, 0.8 p.f leading by EMF method, take Z_s corresponds to short circuit current of 80A.

(OR)

4	a)	Explain the two-reaction theory of salient pole alternator with necessary phasor diagrams.	CO1	7 Marks
	b)	A 100KVA, 3000V, 50Hz, 3-phase, star connected alternator has effective armature resistance of 0.2Ω. The field current of 40A produces short circuit current of 200A and an open circuit voltage 1040V (line voltage). Calculate the full load voltage regulation at 0.8 p.f lagging and leading cases. Draw the phasor diagram.	CO4	7 Marks

UNIT-III

5	a)	What is the necessity of parallel operation of alternators? Give the conditions to be satisfied.	CO1	6 Marks
	b)	What is synchronization? Explain the synchronizing of alternator using three dark lamp method with a neat diagram.	CO5	8 Marks

(OR)

6	a)	Define short circuit ratio? Briefly explain its significance in synchronous machine.	CO2	7 Marks
	b)	Explain the operation of synchronous generator with a constant load and variable excitation.	CO2	7 Marks

UNIT-IV

7	a)	Explain the working of a synchronous induction motor with a neat sketch.	CO1	7 Marks
	b)	What is damper winding? Explain the function of it and where it is located.	CO2	7 Marks
		(OR)		
8	a)	What is synchronous condenser? Explain the operation of synchronous motor as a synchronous condenser.	CO1	6 Marks
	b)	Calculate the R.M.S value of the induced voltage per phase of a 10-pole, 3-phase, 50-Hz alternator with 2 slots per pole per phase and 4 conductors per slot in two layers, the coil span is 150 electrical degrees. The flux per pole has a fundamental component of 0.12 wb and a 20% third harmonic component.	CO4	8 Marks

UNIT-V

9	a)	Using double revolving field theory, explain the torque-slip characteristics of a single phase induction motor and prove that it can not produce any starting torque.	CO2	7 Marks
	b)	Explain how universal motor can be operated from DC as well as AC supplies.	CO2	7 Marks
		(OR)		
10	a)	Explain the construction and operation of AC series motor. Compare the performance with universal motor.	CO2	7 Marks
	b)	Describe the construction and principle of operation of a reluctance motor.	CO1	7 Marks

CODE No.: 16BT50204 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

TRANSMISSION AND DISTRIBUTION

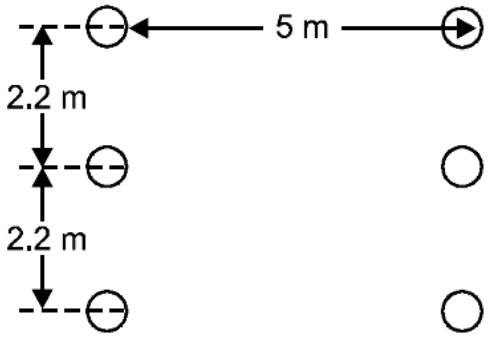
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	A single phase has two parallel conductors 2 meters apart. The diameter of each conductor is 1.2cm. Calculate the loop inductance per km of the line.	CO4	6 Marks
	b)	A 3-phase double circuit line is shown below. Radius of each conductor is 1cm. Determine the capacitance and charging current per km assuming the line is transposed and operating voltage is 220kV, 50Hz.	CO4	8 Marks



(OR)

2	a)	A 33kV, 50Hz, 3-phase underground cable, 4 km long uses three single core cables. Each of the conductor has a diameter of 2.5cm and the radial thickness of insulation is 0.5cm. Determine: i) Capacitance of the cable/phase ii) Charging current/phase iii) Total charging kVAR. The relative permittivity of insulation is 3.	CO4	10 Marks
	b)	Explain about Capacitance Grading.	CO2	4 Marks

UNIT-II

3	a)	Explain the classification of lines based on their length of transmission.	CO2	4 Marks
	b)	A single-phase 50Hz generator supplies an inductive load of 5,000kw at a power factor of 0.707 lagging by means of an overhead transmission line 20km long. The line resistance and inductance are 0.0195Ω and 0.63mH per km. The voltage at the receiving-end is required to be kept constant at 10 KV. Determine: i) the sending-end voltage and voltage regulation of the line. ii) the transmission efficiency.	CO3	10 Marks

(OR)

4	a)	Derive the expression for voltage regulation of medium transmission line if the line is represented by nominal-Π.	CO1	6 Marks
	b)	A 50Hz, 3-phase transmission line is 100km long. It has a total series impedance of 35+j140 ohms and a shunt admittance of $j930 \times 10^{-6}$ S. It delivers 40MW at 220kV, with 90% power factor lagging. Find the losses, efficiency and voltage regulation by nominal-T method.	CO3	8 Marks

UNIT-III

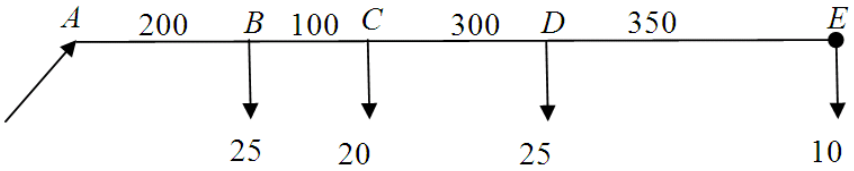
5	a)	A three phase 220kV, 50Hz transmission line consists of 1.2cm radius conductor spaced 2 meters apart in equilateral triangular formation. Find the disruptive critical voltage between the lines if the temperature is 20°C and atmospheric pressure is 72.2cm. Take m_o=0.96. Dielectric strength of air = 21.1kV (rms)/cm.	CO4	7 Marks
	b)	An overhead line has the following data: Span length 160m on level supports, conductor diameter 0.95 cm, weight per unit length of the conductor 0.68kg/m, ultimate stress 4250kg/cm^2, wind pressure 40kg/cm^2 of projected area, factor of safety 5. Find the sag of the conductor	CO4	7 Marks

(OR)

6	a)	A string of 3 insulators is connected across three phase, 66kV line. If the self capacitance of each unit is equal to 6 times pin to earth capacitance. Calculate the potential difference across each unit and string efficiency.	CO4	8 Marks
	b)	Briefly describe the methods of reducing corona effect.	CO2	6 Marks

UNIT-IV

7	a)	A 2-wire DC distributor is loaded as shown in figure below. The voltage at the feeding end is 230V. The distance between sections are given in meters. Determine the cross sectional area of the conductor for a minimum consumer voltage of 220V. Assume the resistance of conductor used for a distributor is 1/60Ω for one meter length and 1sq.mm conductor cross section.	CO5	9 Marks



	b)	Discuss the methods to improve the distributor voltage of an AC distributed system.	CO2	5 Marks

(OR)

8	a)	A DC ring main ABCDA is fed at point A from a 230V supply and the loop resistances of various sections are: AB is 0.04Ω; BC is 0.35Ω; CD is 0.5Ω and DA is 0.05Ω. The main supplies 100 A at B, 150 A at C and 200 A at D. Determine the voltages at each load point. If the points A and C are interconnected through a link of 0.05Ω, determine the voltages at the load points.	CO5	7 Marks
	b)	A single phase distributor AB has a total impedance of (0.1+j0.2)Ω. At the far end B, a current of 80A at 0.8 p.f. lagging and at mid-point C a current of 100A at 0.6p.f. lagging are tapped. If the voltage of the far end is maintained at 200V, determine: (i) Supply end voltage V_A. (ii) Phase angle between V_A and V_B.	CO5	7 Marks

UNIT-V

9	a)	Describe the various factors that are considered in selecting optimal location of substations.	CO1	7 Marks
	b)	Explain the main and transfer bus bar system with circuit diagram.	CO3	7 Marks

(OR)

10	a)	Explain the single bus bar system with sectionalisation and what are its merits and demerits.	CO3	8 Marks
	b)	Explain various distribution planning models.	CO1	6 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

DESIGN OF MACHINE ELEMENTS- II
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks

UNIT-I

1		A journal bearing with a diameter of 200mm and length 150mm carries a load of 20kN, when the journal speed is 150 r.p.m. The diametral clearance ratio is 0.0015. If possible, the bearing is to operate at 35°C ambient temperature without external cooling with a maximum oil temperature of 90°C. If external cooling is required, it is to be as little as possible to minimize the required oil flow rate and heat exchanger size. i) What type of oil do you recommend? ii) Will the bearing operate without external cooling? iii) If the bearing operates without external cooling, determine the operating oil temperature? iv) If the bearing operates with external cooling, determine the amount of oil in kg/min required to carry away the excess heat generated over heat dissipated, when the oil temperature rises from 85°C to 90°C, when passing through the bearing.	CO2	14 Marks

(OR)

2	a)	Discuss about hydrodynamic and hydrostatic lubrication.	CO1	7 Marks
	b)	Design a journal bearing for a centrifugal pump running at 1440 r.p.m. The diameter of the journal is 100mm and load on each bearing is 20kN. The factor *ZN/p* may be taken as 28 for centrifugal pump bearings. The bearing is running at 75°C temperature and the atmosphere temperature is 30°C. The energy dissipation coefficient is 875 W/m^2/°C. Take diametral clearance as 0.1 mm.	CO3	7 Marks

UNIT-II

3		A ball bearing subjected to a radial load of 4000 N is expected to have a satisfactory life of 12000 hours at 720 r.p.m. with a reliability of 95%. Calculate the dynamic load carrying capacity of the bearing, so that it can be selected from manufacturer's catalogue based on 90% reliability. If there are four such bearings each with a reliability of 95% in a system, what is the reliability of the complete system?	CO6	14 Marks

(OR)

4	a)	The ball bearings are to be selected for an application in which the radial load is 2000 N during 90%of the time and 8000 N during the remaining 10%. The shaft is to rotate at 150 r.p.m. Determine the minimum value of the basic dynamic load rating for 5000 hours of operation with not more than 10% failures.	CO6	7 Marks
	b)	Explain in detail about the causes and remedies of rolling contact bearings.	CO1	7 Marks

UNIT-III

5 A 15 kW and 1200 r.p.m. motor drives a compressor at 300 r.p.m. through a pair of spur gears having 20° stub teeth. The centre to centre distance between the shafts is 400mm. The motor pinion is made of forged steel having an allowable static stress as 210MPa, while the gear is made of cast steel having allowable static stress as 140MPa. Assuming that the drive operates 8 to 10 hours per day under light shock conditions, find from the standpoint of strength, CO6 14 Marks

i) Module. ii) Face width.

iii) Number of teeth and pitch circle diameter of each gear.

Check the gears thus designed from the consideration of wear. The surface endurance limit may be taken as 700MPa.

(OR)

6 Design a pair of helical gears for transmitting 22kW. The speed of the driver gear is 1800 r.p.m. and that of driven gear is 600 r.p.m. The helix angle is 30° and profile is corresponding to 20° full depth system. The driver gear has 24 teeth. Both the gears are made of cast steel with allowable static stress as 50MPa. Assume the face width parallel to axis as 4 times the circular pitch and the overhang for each gear as 150mm. The allowable shear stress for the shaft material may be taken as 50MPa. CO3 14 Marks

UNIT-IV

7 A vertical spring loaded valve is required for a compressed air receiver. The valve is to start opening at a pressure of 1 N/mm² gauge and must be fully open with a lift of 4mm at a pressure of 1.2 N/mm² gauge. The diameter of the port is 25mm. assume the allowable shear stress in steel as 480MPa and shear modulus as 80 kN/mm². Design a suitable close coiled round section helical spring having squared ground ends. Also specify initial compression and free length of the spring. CO3 14 Marks

(OR)

8 A composite spring has two closed coil helical springs. The outer spring is 15mm larger than the inner spring. The outer spring has 10 coils of mean diameter 40mm and wire diameter 5mm. The inner spring has 8 coils of mean diameter 30mm and wire diameter 4mm. When the spring is subjected to an axial load of 400 N, find CO4 14 Marks

i) compression of each spring.

ii) load shared by each spring.

iii) shear stress induced in each spring.

The modulus of rigidity may be taken as 84 kN/mm².

UNIT-V

9 Design a cast iron piston for a 4-stroke I.C Engine with the following specifications: CO3 14 Marks

Cylinder bore = 100 mm,
Stroke length = 120 mm,
Maximum gas pressure = 4 N/mm²,
Indicated mean effective pressure=0.7 N/mm²,
Mechanical efficiency = 80%,
Fuel consumption=0.15 kg per BHP hour,
Higher calorific value of the fuel=42 x 10^3 KJ/Kg,
Speed = 2000 r.p.m.

Assume any another relevant data required.

(OR)

10	An open belt connects two flat pulleys. The pulley diameters are 300mm and 450mm and the corresponding angles of lap are 160° and 210°. The smaller pulley runs at 200 r.p.m. The coefficient of friction between the belt and pulley is 0.25. It is found that the belt is on the point of slipping when 3kW is transmitted. To increase the power transmitted two alternatives are suggested, namely i) increasing the initial tension by 10%. ii) increasing the coefficient of friction by 10% by the application of a suitable dressing to the belt. Which of these two methods would be more effective? Find the percentage increase in power possible in each case.	CO5	14 Marks

CODE No.:16BT50302 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

INDUSTRIAL ENGINEERING AND MANAGEMENT
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain various principles of Management.	CO1	7 Marks
	b)	Discuss the Scientific Management Approach of Frank B. Gilbreth.	CO1	7 Marks
		(OR)		
2		Explain in detail about Engineering System and its objectives.	CO1	14 Marks

UNIT-II

3		Explain in detail the objectives and importance of Plant Maintenance.	CO2	14 Marks
		(OR)		
4		Discuss Reliability and explain M.T.T.R, M.T.B.F, Availability, Failure Rate, Probability of Failures and Reliability Improvement Factor.	CO2	14 Marks

UNIT-III

5	a)	Discuss the scope and purpose of Work Study.	CO3	4 Marks
	b)	Describe the procedure for Time Study and its uses in industries.	CO3	10 Marks
		(OR)		
6	a)	Explain work sampling procedure.	CO4	4 Marks
	b)	Calculate the limit of error for 95% confidence, when we estimate the activity use 20% of the time and we have 125 samples.	CO4	10 Marks

UNIT-IV

7	a)	Explain the objectives of Inventory Management.	CO5	7 Marks
	b)	Discuss the flow of Materials in Inventory Management.	CO5	7 Marks
		(OR)		
8		A company makes and sells a seasonal product. Based on a sales forecast of 2000, 3000, 6000 and 5000 per quarter, calculate a level production plan, quarterly ending inventory and average quarterly inventory. If inventory carrying costs are 10 per unit, what is the annual cost of carrying inventory? Opening and ending inventories are zero.	CO5	14 Marks

UNIT-V

9	a)	Construct an operating characteristic curve for N=1000, n=89 and C=2.	CO5	7 Marks
	b)	Discuss about multiple sampling and sequential sampling plans.	CO5	7 Marks
		(OR)		
10		Briefly explain the 7 tools of Quality Control.	CO5	14 Marks

CODE No.: 16BT50303 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

METROLOGY AND MEASUREMENTS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks

UNIT-I

1	a)	Explain the following terms. i) Accuracy. ii) Precision. iii) Calibration. iv) Reproducibility.	CO1	8 Marks
	b)	Describe wavelength standard with its advantages.	CO1	6 Marks
		(OR)		
2	a)	Differentiate between 'Hole basis System' and 'Shaft basis System' of fits.	CO1	6 Marks
	b)	Determine the tolerances on the hole and shaft for a precision running fit designated by 50H7g6. 50mm lies between the range 30-50mm. $i = 0.45\ D^{1/3} + 0.001D$ Fundamental deviation of '**g**' shaft = $-2.5\ D^{0.34}$. State the following. i) Actual maximum and minimum sizes of both hole and shaft. ii) Maximum and minimum clearances.	CO3	8 Marks

UNIT-II

3	a)	Sketch and explain the use of Limit gauges in mass production.	CO5	8 Marks
	b)	State and explain the Taylor's principle of Gauge Design.	CO1	6 Marks
		(OR)		
4	a)	Explain the principle of LVDT with neat sketch.	CO4	7 Marks
	b)	Explain the use of sine bar for measuring angle of a taper plug gauge with the help of a neat sketch.	CO2	7 Marks

UNIT-III

5	a)	Describe the Straight edge method for checking straightness of a surface.	CO2	7 Marks
	b)	What are interferometers? What are their advantages over optical flats?	CO1	7 Marks
		(OR)		
6	a)	Define the following in connection with surface texture assessment. i) Roughness. ii) Waviness. iii) Lay. iv) Sampling length. v) Primary texture. vi) Secondary texture.	CO1	6 Marks
	b)	Describe the principle and operation of Talysurf surface roughness instrument.	CO5	8 Marks

UNIT-IV

7	a)	Enumerate the effect of flank angle error on the effective diameter of a screw thread.	CO2	6 Marks
	b)	Describe the procedure for measuring the effective diameter of screw thread by using two wire method with neat sketch.	CO5	8 Marks
		(OR)		
8	a)	Describe in brief the various elements of the spur gear which are checked for accuracy of the gear.	CO1	6 Marks
	b)	Explain the method used for finding the pressure angle of the gear.	CO3	8 Marks

UNIT-V

9	a)	Explain the usage of strain gauge for measuring torque.	CO4	7 Marks
	b)	Describe the importance of strain gauge Rosettes.	CO2	7 Marks
		(OR)		
10	a)	Explain the following. i) Digital Thermometers. ii) Radiation method for measuring temperature.	CO4	8 Marks
	b)	Discuss the calibration method for pressure measuring instrument.	CO3	6 Marks

CODE No.: 16BT50304 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

REFIRGERATION AND AIR CONDITIONING

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What is meant by refrigeration? State the important applications of refrigeration.	CO1	6 Marks
	b)	The capacity of refrigerator is 150 TR when working between the temperature limits of -10^{0}C and 30^{0}C. Determine the mass of ice produced per day from water at 40^{0}C. Also find the power required to drive the unit. Assume that the cycle operates on reversed Carnot cycle. Take the specific heat of ice as 2.1 kJ/kgK and latent heat of ice as 33 kJ/kg.	CO3	8 Marks

(OR)

2	a)	Explain the working of simple evaporative air cooling system with the help of neat sketch.	CO1	6 Marks
	b)	In a refrigerator working on a Bell Coleman cycle, the air drawn into the compressor from the cold chamber at a pressure of 1 bar and 12^{0}C. After isentropic compression to 4.5 bar, the air is cooled at constant pressure to a temperature of 20^{0}C. The air is then expanded to 1 bar with polytropic expansion index is 1.25 and passed to the cold chamber. Determine: i) Work done per kg of air flow. ii) Refrigerating effect per kg of air flow. iii) Theoretical COP.	CO3	8 Marks

UNIT-II

3	a)	Explain the working of Vapour compression refrigeration system with the help of T-s and P-h diagrams.	CO1	6 Marks
	b)	A vapour compression refrigeration system is operating in between the pressure limits of 60 bar and 25 bar. The working fluid is dry and saturated at end of compression and there is no under cooling before expansion valve. Determine the COP and Capacity of the refrigerator for the fluid flow rate of 5 kg/hr. Data:	CO3	8 Marks

Pressure (bar)	Sat Temp (K)	Enthalpy(kJ/kg)		Entropy (kJ/kgK)	
		Liquid	Vapour	Liquid	Vapour
60	295	151.96	293.29	0.554	1.0332
25	261	56.32	322.58	0.226	1.2464

(OR)

4	a)	Briefly classify the refrigerants and discuss the salient features of four most commonly used refrigerants.	CO1	6 Marks
	b)	A R-12 refrigerator working between the temperatures limits of -10^{0}C and 30^{0}C. The compressor employed is of 20cm x 15cm twin cylinder single acting compressor having a volumetric efficiency of 85%. The compressor runs at 500 r.p.m. The refrigerant is sub cooled and enters at 22^{0}C in the expansion valve. The vapour is superheated and enters the compressor at -2^{0}C. Work out the following: (i) Show the process on T-s and p-h diagrams. (ii) The amount of refrigerant circulated per minute. (iii) The ton of refrigeration and the COP of the system.	CO4	8 Marks

UNIT-III

5	a)	Make a comparison between VCR and VAR systems.	CO1	6 Marks
	b)	Explain the working of Practical Vapour Absorption Refrigeration system with the help of a neat sketch.	CO3	8 Marks

(OR)

6	a)	What is the basic principle of Steam jet refrigeration system? Define: (i) Nozzle efficiency. ii) Entrainment efficiency. iii) Compression efficiency as applied to Steam jet refrigeration system.	CO3	8 Marks
	b)	What is the basic principle in Thermo electric refrigeration system and discuss it's relative advantages and disadvantages.	CO3	6 Marks

UNIT-IV

7	a)	Define the following psychrometric terms. i) DBT. ii) DPT. iii) Absolute humidity. iv) Degree of Saturation. v) Relative humidity. vi) Enthalpy of moist air.	CO5	6 Marks
	b)	A sample of air has DBT and WBT of 35^0C and 25^0C respectively as recorded by a sling psychrometer. The barometric pressure is 1.0132 bar. Make calculations for: i) the vapour pressure. ii) the relative humidity. iii) the specific humidity. iv) the degree of saturation. v) the vapour density of air. vi) the dew point temperature. vii) the enthalpy of the mixture.	CO5	8 Marks

(OR)

8	a)	Explain the following psychrometric processes. i) Sensible cooking. ii) Sensible heating. iii) Cooling and dehumidification. iv) Heating and humidification.	CO5	8 Marks
	b)	$90m^3$ of air per minute at 20^0C and 75% RH is heated until its temperature becomes 30^0C. Calculate: i) RH of the heated air. (ii) heat added to air per minute.	CO5	6 Marks

UNIT-V

9	a)	Explain the working of summer air conditioning system for hot and humid air with the help of neat sketch and showing important calculation that can be made.	CO6	6 Marks
	b)	A restaurant with a capacity of 100 persons is to be air conditioned with the following conditions: Outside conditions: 30^0C DBT and 70% RH, Desires inside conditions: 23^0C DBT and 55% RH, Quantity of air supplied: $0.5m^3$/min/person. The desired conditions are achieved by cooling, dehumidifying and then heating. Determine: i) Capacity of the cooling coil in tonnes of refrigeration. ii) Capacity of heating coil. iii) Amount of water removed by dehumidifier. iv) By-pass factor of the heating coil of its surface temperature is 35^0C.	CO6	8 Marks

(OR)

10	a)	Briefly discuss the factors affecting human comfort and discuss the concept of effective temperature.	CO6	4 Marks
	b)	The following data refer to summer air conditioning of a building: Outside design conditions: 43^0C DBT, 27^0C WBT; Inside design conditions: 25^0C DBT, 50% RH; Room sensible heat gain: 84,000 kJ/h; Room latent heat gain: 21,000 kJ/h; Bypass factor of the cooling coil used is 0.2; The return air from the room is mixed with the outside air before entry to cooling coil in the ratio of 4:1 by mass. Determine: i) Apparatus dew point of the cooling coil. ii) Entry and exit conditions of air for cooling coil. iii) Fresh air mass flow rate. iv) Refrigeration load on the cooling coil.	CO6	10 Marks

NOTE: ***Refrigerants and Refrigerant properties data book must be supplied in the examination hall***

CODE No.: 16BT50305 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

THERMAL ENGINEERING-II

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Compare the Rankine efficiency of a high pressure plant operating from 80 bar and 400^{0}C with a low pressure plant operating from 40 bar and 400^{0}C, if the condenser pressure in both the cases is 0.07 bar.	CO1	7 Marks
	b)	Consider a steam power plant operating on the simple ideal Rankine cycle. Dry saturated steam enters the turbine at 15Mpa and leaves at 100kPa pressure. The exhaust steam enters the condenser and leaves it as saturated liquid. Draw the cycle on T-s and h-s diagrams and also determine the work produced by the turbine, work consumed by the pump and the thermal efficiency of the plant.	CO1	7 Marks

(OR)

2	a)	Describe the functioning the Benson boiler with the help of a diagram.	CO1	7 Marks
	b)	Explain the function of following mountings. i) Fusible plug. ii) Feed check valve. iii) Safety valve.	CO2	7 Marks

UNIT-II

3	a)	Define the following terms. i) Factor of evaporation. ii) Chimney efficiency. iii) Boiler draught	CO1	7 Marks
	b)	Discuss the classification of boiler draught.	CO3	7 Marks

(OR)

4	a)	A Lancashire boiler generates 2500 kg of dry steam/hr at a pressure of 11 bae. The grate area is 3.6m^2 and 75 kg of coal is burnt/m^2 of grate are/hr. The calorific value of the coal is 33,200 kj/kg and temperature of feed wated is 17.5^{0}C. Determine: i) Actual Evaporation/kg of coal. ii) Equivalent evaporation from and at 100^{0}C. iii) Efficiency of the boiler	CO1	7 Marks
	b)	Discuss briefly about preparation of heat balance sheet applied to boilers.	CO4	7 Marks

UNIT-III

5	a)	The inlet conditions of steam to a C-D nozzle is 20bar and 260^{0}C. The exit pressure is 4 bar. Assuming frictionless flow up to the throat and nozzle efficiency of 85%, determine: i) the flow rate for a throat area of 32.2cm^2 ii) the exit area	CO1	7 Marks
	b)	Classify the nozzles. What is theoretical pressure ratio for dry saturated steam and super heated steam?	CO2	7 Marks

(OR)

6	a)	Steam enters the blade row of an impulse turbine with a velocity of 600 m/s at angle of 25^0 to the plane of rotation of the blades. The mean blade speed is 255 m/s. The blade angle on the exit side is 30^0. The blade friction coefficient is 10%. Determine: i) Work done per kg of steam. ii) Diagram efficiency. iii) Axial thrust per kg of steam.	CO1	7 Marks
	b)	What is the classification of steam turbines?	CO5	7 Marks

UNIT-IV

7	a)	In a reaction stage of a steam turbine, the nozzle angle is 20^0 and the absolute velocity of steam at inlet to the moving blades is 240m/s. The blade velocity is 210m/s. If the blades are designed for 50% reaction, determine: i) The blade angle at inlet and exit. ii) The enthalpy drop per unit mass of steam in the moving blades and in the complete stage . iii) The diagram power for a steam flow of 1kg/s. iv) The diagram efficiency.	CO2	7 Marks
	b)	What is degree of reaction? Discuss the working of parson's reaction turbine.	CO1	7 Marks
		(OR)		
8	a)	Differentiate surface and jet condensers.	CO1	7 Marks
	b)	Explain the working of a Counter flow jet condenser with neat diagram.	CO2	7 Marks

UNIT-V

9	a)	In a gas turbine plant working on brayton cycle, the air at inlet is 27°c, 0.1MPa.The pressure ratio is 6.25 and the maximum temperature is 800°C. The turbine and compressor efficiencies are each 80%. Find the compressor work, turbine work, heat supplied, cycle efficiency and turbine exhaust temperature. Mass of air may be considered as 1Kg. Draw T-S diagram.	CO1	7 Marks
	b)	An ideal air standard Brayton cycle operates with air. At the compressor inlet, the air is at 500K and at the turbine outlet the gas is at 1400K. The pressure ratio of the cycle is. Determine: i) Net work done. ii) Thermal efficiency.	CO2	7 Marks
		(OR)		
10	a)	Distinguish between rocket propulsion and turbojet propulsion Engines.	CO2	7 Marks
	b)	Discuss the working principle of turbojet Engine with neat diagram.	CO2	7 Marks

CODE No.: 16BT50306 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

HUMAN RESOURCE MANAGEMENT
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Define Human Resource Management (HRM). Explain the functions of HRM.	CO1	14 Marks
		(OR)		
2	a)	Elucidate the factors that effecting Human Resource Planning (HRP).	CO3	7 Marks
	b)	Explain the barriers to HRP.	CO3	7 Marks

UNIT-II

3	a)	Briefly explain the methods of collecting data for job analysis.	CO1	7 Marks
	b)	What barriers are implicated for effective selection?	CO2	7 Marks
		(OR)		
4		Write a detailed note on the modern practices of Recruitment.	CO2	14 Marks

UNIT-III

5	a)	Describe the nature and process of Training.	CO3	7 Marks
	b)	List out the Impediments to effective Training.	CO3	7 Marks
		(OR)		
6		How is the compensation plan of an employee derived? What are the factors that play a vital role in determining pay?	CO2	14 Marks

UNIT-IV

7	a)	List out the approaches to Industrial relations.	CO4	7 Marks
	b)	Write a short note on: i) Industrial Disputes Act. ii) Employee Compensation Act. iii) Indian Factories act.	CO1	7 Marks
		(OR)		
8		Define Trade Unions. Explain Trade Unions movement in India.	CO1	14 Marks

UNIT-V

9	a)	Define the term Ethics. What are the sources of business ethics?	CO6	7 Marks
	b)	As a HR Manager, how do you manage ethical issues in HRM?	CO6	7 Marks
		(OR)		
10	a)	Outline the ISO safety standards.	CO5	7 Marks
	b)	Describe ethical dilemmas.	CO6	7 Marks

CODE No.: 16BT50308 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

MECHATRONICS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define Mechatronics. What are the objectives of Mechatronics?	CO1	5 Marks
	b)	Explain various elements of Mechatronics systems with an example.	CO1	9 Marks
		(OR)		
2	a)	Define the role of Automation. Explain how a Mechatronics system fits into it.	CO1	5 Marks
	b)	Compare Traditional Design approach with Mechatronics Design approach.	CO1	5 Marks
	c)	Differentiate Closed and Open loop feedback system.	CO1	4 Marks

UNIT-II

3		Write about:		
		i) Hall effect sensor.	CO2	5 Marks
		ii) Proximity Sensor.	CO2	5 Marks
		iii) Any light sensor used in Camera.	CO2	4 Marks
		(OR)		
4	a)	Explain various elements of Hydraulic system with neat sketches.	CO2	10 Marks
	b)	Write the working principle of Stepper motor.	CO2	4 Marks

UNIT-III

5	a)	What is signal conditioning? What is the necessity of signal conditioning and list the functions?	CO3	8 Marks
	b)	Write about: i) Noise filter. ii) Voltage to frequency converter.	CO3	6 Marks
		(OR)		
6	a)	Write the differences between Analogue and Digital signals.	CO3	4 Marks
	b)	Write about Digital to Analogue converter.	CO3	10 Marks

UNIT-IV

7	a)	What are various process controllers and write controller principles.	CO4	6 Marks
	b)	Explain PID controller by Oscillation method.	CO4	8 Marks
		(OR)		
8	a)	Write about PI controller.	CO4	6 Marks
	b)	Explain Adaptive controller.	CO4	8 Marks

UNIT-V

9		Explain Washing machine mechanism with Mechatronics system.	CO5	14 Marks
		(OR)		
10		Write about automatic car park barrier system.	CO5	14 Marks

CODE No.: 16BT50401 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

DIGITAL COMMUNICTIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Sketch the electrical representation of binary data 101000111 using different formats.	CO1	7 Marks
	b)	Discuss the advantages of DM over PCM.	CO2	7 Marks
		(OR)		
2	a)	What is the necessity of non-uniform quantization and explain companding.	CO1	7 Marks
	b)	If mp = 20V and 256 quantizing levels are employed, what is the voltage between levels when there is no compression? For $\mu = 255$, what is the smallest and what is the largest effective separation between levels.	CO2	7 Marks

UNIT-II

3	a)	Analyze the effect of thermal noise in PCM.	CO2	7 Marks
	b)	Derive the expression for Signal to Quantization noise ratio in Delta modulation.	CO2	7 Marks
		(OR)		
4		Justify that the output SNR in a PCM system is superior to that of a DM system.	CO3	14 Marks

UNIT-III

5	a)	Compare probability of error of different modulation techniques.	CO2	7 Marks
	b)	Implement a digital system for generation and reception of BFSK.	CO6	7 Marks
		(OR)		
6	a)	Explain the generation and reception of DPSK signal with example.	CO6	7 Marks
	b)	Explain the principle of QPSK system. Compare binary PSK and QPSK schemes.	CO2	7 Marks

UNIT-IV

7	a)	Define the following terms: i) Channel Capacity. ii) Rate of information.	CO1	4 Marks
	b)	Consider five symbols given by the probabilities 1/2, 1/4, 1/8, 1/16, 1/16. (i) Calculate Entropy (ii) Use Huffman algorithm to develop an efficient code and calculate the average number of bits/symbol. Compare with Entropy.	CO5	10 Marks
		(OR)		
8	a)	Differentiate the terms: i) Data and Information. ii) Define entropy.	CO5	8 Marks
	b)	Find the Channel capacity of Binary symmetric channel.	CO5	6 Marks

UNIT-V

9	a)	Compare linear block codes and cyclic codes with an example.	CO4	6 Marks
	b)	What is the use of syndrome? Draw the (n-k) syndrome calculation circuit for (n, k) cyclic code and explain its operation.	CO3	8 Marks

(OR)

10	a)	The generation matrix for a (6,3) clock code is given below. Construct all code vectors of this code. $G = \begin{bmatrix} 1 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 0 & 1 \end{bmatrix}$.	CO3	8 Marks
	b)	What are cyclic codes? List their advantages and disadvantages.	CO4	6 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

MICROPROCESSORS AND MICROCONTROLLERS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What is an Assembler directive and explain any three Assembler directives.	CO2	7 Marks
	b)	Develop an Assembly Language program to move a string from one memory location to another memory location using string instructions.	CO4	7 Marks
		(OR)		
2	a)	Discuss the fields of flag register in detail.	CO1	7 Marks
	b)	Compose an Assembly Language program to arrange given bytes in ascending order residing in memory at an offset of 6000H from segment base.	CO4	7 Marks

UNIT-II

3	a)	Describe in detail bus activities of 8086 microprocessor during memory read operation in minimum mode.	CO1	8 Marks
	b)	Explain interrupt vector table of 8086 microprocessor.	CO1	6 Marks
		(OR)		
4		Explain pin-diagram of 8086 microprocessor.	CO1	14 Marks

UNIT-III

5		Explain the internal architecture of 8255 PPI.	CO1	14 Marks
		(OR)		
6	a)	Illustrate the purpose of DMA controller in microprocessor based system designs and point out the need for DMA control in a microprocessor based system.	CO1	7 Marks
	b)	Write an Assembly Language program to initialize 8251 and receive 100 bytes of data.	CO3	7 Marks

UNIT-IV

7	a)	Differentiate microcontroller and microprocessor.	CO1	4 Marks
	b)	Explain the pin diagram of 8051 microcontroller.	CO1	10 Marks
		(OR)		
8	a)	Describe in detail addressing modes of 8051 with suitable examples.	CO1	7 Marks
	b)	Develop an Assembly Language program to move 16 bytes of data from ROM starting at location 9000H to RAM starting at 9000H.	CO4	7 Marks

UNIT-V

9	a)	Calculate the value to be loaded in to the timer registers if we want to have a time delay of 4ms show the program for timer 1 to create a pulse width of 4ms on pin P2.2. Assume X TAL=11.0592MHz.	CO4	7 Marks
	b)	Illustrate the serial communication in 8051 with its special function registers.	CO2	7 Marks
		(OR)		

10	a)	Design instructions to: i) Disable the serial interrupt, timer 1 interrupt and external hardware interrupts. ii) Enable timer 0 interrupt then. iii) Enable all interrupts with a single instruction.	CO3	7 Marks
	b)	Draw and explain the bit for mats of IE and IP registers in 8051.	CO1	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

VLSI DESIGN

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks

UNIT-I

1	a)	Identify where the diffusion and deposition process are used in NMOS/CMOS fabrication process.	CO1	7 Marks
	b)	Compare the relative merits of three different forms of pull-up for an inverter circuit. What is the best choice for realization in: i) NMOS technology. ii) CMOS technology.	CO2	7 Marks

(OR)

2	a)	Why CMOS inverter is called as ratioless logic? Explain in detail.	CO2	7 Marks
	b)	Consider an NMOS transistor in a 0.6μm process with *W/L* = 4/2 λ (i.e., 1.2/0.6 μm). In this process, the gate oxide thickness is 100 ºA and the mobility of electrons is 350cm^2/V·s. The threshold voltage is 0.7V. Plot *Ids* ***vs.*** *Vds* for *Vgs* = 0, 1, 2, 3, 4 and 5V. ε_{si} = 3.9 x 8.85 x 10^{-14} F/cm.	CO1	7 Marks

UNIT-II

3	a)	A particular layer of MOS circuit has a resistivity p = 1Ω cm. A section of this layer is 55 μm long and 5 μm wide and has a thickness of 1 μm. Calculate the resistance from one end of this section to the other (along the length). Use the concept of sheet resistance *Rs*. What is the value of *Rs*?	CO4	7 Marks
	b)	Explain how delay estimation can be performed for a standard MOS delay unit.	CO3	7 Marks

(OR)

4	a)	Represent the stick diagram of inverter for ratioed and ratioless logic. Illustrate with examples.	CO4	7 Marks
	b)	Construct NMOS inverter layout with the help of λ-based rules. Clearly mention the design rules used in the layout.	CO1	7 Marks

UNIT-III

5	a)	Discuss the use of pass transistor logic for functional unit design. Identify the limitations of pass transistor logic.	CO5	7 Marks
	b)	Estimate CMOS inverter delay using rise-time and fall-time estimation.	CO5	7 Marks

(OR)

6	a)	Explain the construction of transmission gate based adder in detail.	CO4	7 Marks
	b)	Draw the static CMOS logic circuit for the following expression. i) Y= (ABCD)′. ii) Y= [D(A+BC)]′.	CO4	7 Marks

UNIT-IV

7	a)	Differentiate the channeled gate array and channeless gate array.	CO1	7 Marks
	b)	Explain the FPGA design flow and bring out the differences with ASIC design flow.	CO5	7 Marks

(OR)

8	a)	Discuss in detail, different architectures of programmable interconnects in FPGA.	CO1	7 Marks
	b)	Discuss any two types of programming technology used in FPGA design.	CO1	7 Marks

UNIT-V

9	a)	Discuss various fault models used for testing process.	CO6	7 Marks
	b)	Differentiate the process of test vector generation for combinational and sequential circuits.	CO6	7 Marks

(OR)

10	a)	Discuss the use of power management techniques for low power designs.	CO3	7 Marks
	b)	Discuss various approaches available in design for testability.	CO1	7 Marks

CODE No.: 16BT50442 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

MICROPROCESSORS & INTERFACING

[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Describe the functional block diagram of 8086 microprocessor.	CO1	10 Marks
	b)	What are the advantages of pipelining in 8086?	CO1	4 Marks
		(OR)		
2		Describe the process of 20-bit physical address calculation in 8086. Explain the concept with the help of an example.	CO1	14 Marks

UNIT-II

3		Explain the functionality of 8086 in both minimum and maximum modes with sketches.	CO5	14 Marks
		(OR)		
4	a)	Explain the sequence of events that occur when 8086 encounters an interrupt.	CO1	4 Marks
	b)	Explain the following Assembler Directives of 8086 Microprocessor. i) ASSUME. ii) LABEL. iii) START. iv) GLOBAL. v) EQU.	CO2	10 Marks

UNIT-III

5	a)	Explain the CWR of I/O modes of operation of 8255 with neat sketches.	CO1	8 Marks
	b)	Draw and explain the Handshake mode of 8086 in detail with sketches.	CO1	6 Marks
		(OR)		
6		Describe the different registers of 8289 PIC with neat sketches.	CO2	14 Marks

UNIT-IV

7	a)	Describe the internal architecture of 8257 DMA.	CO2	9 Marks
	b)	What is Cycle Stealing Mode of transfer in 8257?	CO2	5 Marks
		(OR)		
8	a)	How is the TC Stop bit used in 8257?	CO2	5 Marks
	b)	What do you understand by Auto Load Bit (7) in 8257?	CO2	5 Marks
	c)	What is the functionality of AEN pin available in 8257?	CO2	4 Marks

UNIT-V

9	a)	Explain the alternate functions of any two pins of port3 in an 8051 microcontroller.	CO5	7 Marks
	b)	Mention the priority order of interrupts in an 8051 microcontroller.	CO3	7 Marks
		(OR)		
10	a)	Explain any two bit addressable registers in 8051 microcontroller with formats.	CO3	7 Marks
	b)	Explain the steps that happen when an interrupt occurs in an 8051 microcontroller specifying one example.	CO5	7 Marks

CODE No.: 16BT50501 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

COMPUTER NETWORKS

[Electronics and Communication Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Differentiate OSI reference model with the TCP/IP reference model.	CO1	10 Marks
	b)	What are the two reasons for using layered protocols? Mention its advantages and disadvantages.	CO2	4 Marks
		(OR)		
2	a)	Explain in detail about Guided Transmission Media.	CO2	7 Marks
	b)	Explain the significance of switching. What are different switching techniques used in computer networks? Discuss.	CO6	7 Marks

UNIT-II

3	a)	Differentiate Fast and Giga Ethernet Technologies.	CO2	7 Marks
	b)	Calculate the efficiency of Slotted ALOHA with derivation.	CO4	7 Marks
		(OR)		
4	a)	Explain the methods used for error correction and error detection.	CO2	10 Marks
	b)	What is meant by virtual LAN's? Explain in detail about CSMA protocols.	CO2	4 Marks

UNIT-III

5	a)	Explain the Link State Routing algorithm. Mention the limitations of the same.	CO3	7 Marks
	b)	What is meant by Anycast Routing? Draw IPv4 header and briefly explain it.	CO3	7 Marks
		(OR)		
6	a)	Describe different design issues of Network Layer.	CO3	7 Marks
	b)	Explain the shortest path algorithm with suitable illustrations.	CO4	7 Marks

UNIT-IV

7	a)	Briefly explain about the UDP segment header.	CO1	7 Marks
	b)	Discuss Timer Management in Transport Layer.	CO2	7 Marks
		(OR)		
8	a)	The maximum payload of a TCP segment is 65,495 bytes. Why was such strange number chosen?	CO4	7 Marks
	b)	How UDP is different from TCP? Discuss.	CO2	7 Marks

UNIT-V

9	a)	With neat sketch, explain about the Domain Name System (DNS).	CO1	7 Marks
	b)	List and elaborate different Message Formats.	CO6	7 Marks
		(OR)		
10	a)	What is meant by cookie? Mention possible attacks in Application Layer.	CO2	7 Marks
	b)	Write short notes on the following: i) E-mail. ii) HTTP.	CO1	7 Marks

CODE No.: 16BT50502 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

LINUX PROGRAMMING

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	List File and Directory maintenance commands.	CO1	9 Marks
	b)	Describe Zombie processes.	CO1	5 Marks
		(OR)		
2	a)	Write a shell script that counts number of lines in an input file using for loop.	CO3	7 Marks
	b)	Write a shell program to find whether a given number is prime or not using command line arguments.	CO5	7 Marks
		UNIT-II		
3	a)	Differentiate between PIPEs and FIFOs.	CO2	7 Marks
	b)	Write a shell script that accepts one or more filenames as arguments and converts all of them to uppercase, provided they exist in the current directory.	CO6	7 Marks
		(OR)		
4	a)	Discuss the necessity of shell programming.	CO1	7 Marks
	b)	Explain the contents of thread structures and their uses.	CO1	7 Marks
		UNIT-III		
5	a)	What is Socket? Explain Socket System calls for connectionless protocols.	CO1	7 Marks
	b)	Discuss Socket attributes.	CO1	7 Marks
		(OR)		
6	a)	Perform client and server program Socket programming for exchanging of data using system calls.	CO4	7 Marks
	b)	Discuss about system calls and device drivers.	CO1	7 Marks
		UNIT-IV		
7	a)	Write a C program to display Environment Variables.	CO3	7 Marks
	b)	Illustrate the working principles of parent process and child process using fork command.	CO5	7 Marks
		(OR)		
8	a)	Analyze shell scripts.	CO2	7 Marks
	b)	Implement the IPC form PIPE.	CO4	7 Marks
		UNIT-V		
9	a)	Discuss File system structure in Linux.	CO1	7 Marks
	b)	Analyze system calls.	CO2	7 Marks
		(OR)		
10	a)	Write a shell program to print a multiplication table of a number given from command line.	CO6	7 Marks
	b)	Describe process scheduling.	CO1	7 Marks

❀ ❀ ❀

CODE No.: 16BT50503 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

COMPUTER VISION
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Describe different sources and their effects for the lambertian with specular model area.	CO1	9 Marks
	b)	Analyze different shadow removal using color with an example.	CO2	5 Marks
		(OR)		
2	a)	Explain about color matching.	CO1	4 Marks
	b)	In the CMY space, the three primary colors are cyan, magenta and yellow. CMY mixing is subtractive, recall we showed that mixing cyan and magenta by over printing resulted in blue. What color is obtained by mixing cyan and yellow?	CO6	10 Marks
		UNIT-II		
3	a)	Discuss synthesizing texture. How they are used for generating different filling holes in images?	CO2	7 Marks
	b)	Investigate about local texture representation using filters of an image.	CO1	7 Marks
		(OR)		
4	a)	Write a note on human stereopsis with an example.	CO2	9 Marks
	b)	List the advantages and disadvantages of epipolar constraint.	CO2	5 Marks
		UNIT-III		
5	a)	Develop Shot Boundary detection algorithm interframe differences.	CO3	7 Marks
	b)	Analyze the important applications of interactive segmentation.	CO3	7 Marks
		(OR)		
6	a)	Explain division clustering with a graph by normalized cuts concept.	CO1	7 Marks
	b)	Give in detail mean shift to find local modes for any sample data.	CO3	7 Marks
		UNIT-IV		
7	a)	Explain classification of receiver operating curves concept in detail.	CO1	7 Marks
	b)	Differentiate between error and loss.	CO3	7 Marks
		(OR)		
8		Discuss the detection objects in images for the sliding window method.	CO3	14 Marks
		UNIT-V		
9	a)	Demonstrate geometric and semantic questions for the concept of object recognition.	CO1	9 Marks
	b)	Describe the purpose of basic technology on semantic object recognition.	CO2	5 Marks
		(OR)		
10		Analyze approximate nearest neighbors and hashing concepts with their examples.	CO1	14 Marks

CODE No.: 16BT50504 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

DATA COMMUNICATIONS

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks

UNIT-I

1	a)	Explain the different transmission models in data communications. Briefly explain about network components.	CO1	6 Marks
	b)	Draw the TCP/IP protocol suite and explain the functionality of the layers.	CO1	8 Marks
		(OR)		
2	a)	Explain the different types of noise that interfere with data communication signals.	CO1	7 Marks
	b)	What are the different types of Network models? Compare analog and digital modulation.	CO2	7 Marks

UNIT-II

3		What is companding? Explain analog and digital companding in detail.	CO1	14 Marks
		(OR)		
4	a)	Compare analog and digital transmission.	CO2	4 Marks
	b)	What is superframe and extended superframe TDM format? Explain briefly.	CO3	10 Marks

UNIT-III

5	a)	What are the three modes of terrestrial propagation of Electromagnetic waves? Explain in detail.	CO1	7 Marks
	b)	Draw functional block diagram of a standard telephone set and explain the components.	CO1	7 Marks
		(OR)		
6	a)	What is satellite multiple accessing arrangement? List and describe in detail the three forms of satellite multiple accessing arrangements with neat diagrams.	CO3	7 Marks
	b)	Explain the working of electronic telephone and subscriber loop.	CO1	7 Marks

UNIT-IV

7	a)	List various data communications character codes and explain.	CO1	10 Marks
	b)	Compare soft handoff and hard handoff.	CO3	4 Marks
		(OR)		
8	a)	With a diagram, explain first generation analog cellular telephone.	CO1	8 Marks
	b)	Describe Universal Product Code (UPC).	CO1	6 Marks

UNIT-V

9		Give a brief note on the seven components that make up a two-point data communication circuit.	CO1	14 Marks
		(OR)		
10	a)	Describe basic functions of DSU and CSU.	CO1	8 Marks
	b)	Compare Cable modems and standard Voice-band modems.	CO1	6 Marks

CODE No.: 16BT51001 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

BIOMEDICAL INSTRUMENTATION
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks

UNIT-I

1	a)	Outline a biomedical instrumentation system and explain about each component.	CO1	7 Marks
	b)	Illustrate the process of propagation of electrical pulses along the axon and neuro muscular junction with relevant diagrams.	CO1	7 Marks
		(OR)		
2		Discuss the biochemical transducers in detail.	CO5	14 Marks

UNIT-II

3	a)	Explain the anatomy and conducting system of heart with neat sketch.	CO1	7 Marks
	b)	Summarize the specifications of an ECG recorder.	CO1	7 Marks
		(OR)		
4	a)	With a neat sketch, discuss various heart sounds generated during a normal cardiac cycle.	CO1	7 Marks
	b)	Describe the process of blood pressure measurement using sphygmomanometer with neat and labeled diagram.	CO5	7 Marks

UNIT-III

5	a)	What is respiration? Describe the mechanism of respiration.	CO1	7 Marks
	b)	Discuss the 10-20 electrode placement system for EEG.	CO4	7 Marks
		(OR)		
6	a)	Illustrate the principle of working of ventilators.	CO5	7 Marks
	b)	Write short note on EEG in diagnostics.	CO2	7 Marks

UNIT-IV

7		Outline the process of Hemodialysis with diagrams. How does this technique play a useful role in medical field? Give a few examples and state the limitations of this technique.	CO5	14 Marks
		(OR)		
8		What is pacemaker? Illustrate the operation of ventricular inhibited pacemaker.	CO5	14 Marks

UNIT-V

9		Explain the principle of MRI and compare its method of visualization with CT method.	CO5	14 Marks
		(OR)		
10		Write short note on:		
		i) Echo Cardiography.	CO1	7 Marks
		ii) Ultrasonic imaging.	CO1	7 Marks

CODE No.: 16BT51002 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

INDUSTRIAL INSTRUMENTATION - II

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Describe the principle of buoyancy type density measuring instrument.	CO1	7 Marks
	b)	Explain the principle of rotating concentric cylinder viscometer with a neat diagram.	CO1	7 Marks
		(OR)		
2	a)	Discuss the principle and working of hygrometer method of humidity measurement in detail.	CO1	7 Marks
	b)	Explain the principle of Saybolt's viscometer with a neat diagram.	CO1	7 Marks

UNIT-II

3	a)	Explain the principle and working of Bubbler type liquid level measuring system.	CO4	7 Marks
	b)	Discuss the design aspects of flat and shaft type level measuring device.	CO4	7 Marks
		(OR)		
4	a)	Explain the scheme of capacitance type level gauging in detail.	CO2	7 Marks
	b)	Discuss the process of ultrasonic level gauging in both liquid and vapor phases.	CO2	7 Marks

UNIT-III

5	a)	Describe the principle and working of venture flow meter.	CO1	7 Marks
	b)	Calculate the flow rate in kg/hr of saturated steam flowing in a 20cm line at a pressure of 34 kg/cm^2 and producing a head of 20cm of mercury across a venture neck with $\beta = 0.5$ and across an orifice with $\beta = 0.5$.	CO1	7 Marks
		(OR)		
6	a)	What are the different types of ultrasonic flow meters? Describe ultrasonic flow measurement system with a neat schematic diagram.	CO5	7 Marks
	b)	Discuss about various sensors that are used in Vortex flow meters and along with their method of detection.	CO5	7 Marks

UNIT-IV

7	a)	Describe the principle of Wheatstone bridge conditioning circuit used with thermistors.	CO3	7 Marks
	b)	Write a detailed note on thermistors.	CO3	7 Marks
		(OR)		
8	a)	Discuss the principle of low drift amplifiers.	CO3	7 Marks
	b)	Describe the principle of electrometer amplifier.	CO3	7 Marks

UNIT-V

9	a)	Describe the working of Hall – Effect proximity switch in the Head-on and Slide-by modes.	CO6	7 Marks
	b)	Discuss about the working of Mechanical Limit switch provided with a fixed lever actuator with a neat diagram.	CO6	7 Marks
		(OR)		
10	a)	What are the essentials of purging, pressurization and ventilation? Discuss about a typical purge assembly.	CO6	7 Marks
	b)	Discuss various approaches of safety in case of Explosion hazards.	CO6	7 Marks

❀ ❀ ❀

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

PRINCIPLES OF COMMUNICATIONS

[Electrical and Electronics Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks

UNIT-I

1	a)	With neat sketches, explain how DSB-SC waves are generated using Balanced modulator and Ring modulator	CO3	10 Marks
	b)	A DSB-SC signal is generated using the carries $\cos(\omega_c t + \theta)$ and modulating signal $x(t)$. Find the envelope of the DSB-SC signal.	CO2	4 Marks
		(OR)		
2	a)	Write a detailed note on block diagram of electrical communication system.	CO1	10 Marks
	b)	Define modulation and explain when modulation is required.	CO5	4 Marks

UNIT-II

3	a)	Explain the generation of FM waves using indirect FM method.	CO3	10 Marks
	b)	A 10MHz carrier is frequency modulated by a sinusoidal signal of 500Hz, the maximum frequency deviation being 50KHz. Using the Carson's rule find the required bandwidth.	CO2	4 Marks
		(OR)		
4	a)	Compare Frequency Modulation and Phase Modulation.	CO5	7 Marks
	b)	With a neat sketch, explain the demodulation of FM waves.	CO1	7 Marks

UNIT-III

5	a)	Explain the methods of getting the pulse amplitude modulated waveform.	CO3	7 Marks
	b)	Write a brief note on digital communication system and its advantages.	CO1	7 Marks
		(OR)		
6	a)	Compare PAM, PWM and PPM.	CO5	7 Marks
	b)	Explain the PAM signal recovery through holding circuit method.	CO3	7 Marks

UNIT-IV

7	a)	Compare the three basic forms of digital pulse modulation.	CO5	10 Marks
	b)	A sinusoidal signal is transmitted using PCM. The output signal to quantizing noise ratio is required to be 55.8 dB. Find the minimum number of representation levels L required to achieve this performance.	CO4	4 Marks
		(OR)		
8	a)	Write a brief note on companding.	CO1	4 Marks
	b)	With a neat sketch, explain the PCM system.	CO3	10 Marks

UNIT-V

9	a)	A continuous signal is band limited to 5KHz. The signal is quantized in 8 levels of a PCM system with probabilities 0.25, 0.2, 0.2, 0.1, 0.1, 0.5, 0.5 and 0.5. Calculate Entropy and the rate of information.	CO4	4 Marks
	b)	Explain how Block codes are used for error control.	CO6	10 Marks
		(OR)		
10	a)	Explain Huffman coding with an example.	CO6	7 Marks
	b)	Write a brief note on methods of error correction.	CO6	7 Marks

❀ ❀ ❀

CODE No.: 16BT51004 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

COMPUTER ORGANISATION AND ARCHITECTURE

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks

UNIT-I

1	a)	Draw the flowchart for adding or subtracting two floating point binary numbers.	CO5	10 Marks
	b)	Explain the different types of computers.	CO1	4 Marks
		(OR)		
2	a)	Explain the multiplication of positive numbers using array multiplier with a neat sketch.	CO1	10 Marks
	b)	Draw the flow chart for division algorithm.	CO5	4 Marks

UNIT-II

3	a)	Design 4-bit adder/subtractor and explain its function.	CO3	7 Marks
	b)	What is register transfer language? Explain the basic symbols used in register transfer.	CO1	7 Marks
		(OR)		
4	a)	Draw the block diagram of arithmetic logic shift unit and explain its operations.	CO1	7 Marks
	b)	List and explain the steps involved in the execution of a complete instruction.	CO1	7 Marks

UNIT-III

5	a)	With a neat diagram, explain the pin diagram of 8085.	CO1	7 Marks
	b)	Discuss about arithmetic and logical instructions in detail.	CO1	7 Marks
		(OR)		
6	a)	Draw and give analysis of the timing diagram for a memory read operation of 8085 microprocessor.	CO2	7 Marks
	b)	Discuss about the following of 8085 in detail: i) LHLD. ii) STAX. iii) OUT.	CO1	7 Marks

UNIT-IV

7	a)	What is an addressing mode? Explain various addressing modes of 8085 with suitable examples.	CO1	7 Marks
	b)	Write a program to arrange first 10 numbers from memory address 3000H in an ascending order.	CO4	7 Marks
		(OR)		
8	a)	What is an Interrupt? Explain about maskable interrupts of 8085.	CO1	7 Marks
	b)	Write a program to exchange the data at 5000M and 6000M memory location in reverse order.	CO4	7 Marks

UNIT-V

9	a)	Give the organization of typical hardwired control unit and explain the functions performed by the various blocks.	CO3	10 Marks
	b)	Highlight the solutions of instruction hazards.	CO1	4 Marks
		(OR)		
10	a)	Explain in detail about instruction execution characteristics.	CO1	7 Marks
	b)	Illustrate the various mapping techniques of Cache memory.	CO2	7 Marks

CODE No.: 16BT51041 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

SENSOR AND SIGNAL CONDITIONING
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Explain the construction and working of the: i) Resistive temperature detectors. ii) Light dependent resistor.	CO1	8 Marks
	b)	Discuss working principle of Hot-wire resistive transducer.	CO2	6 Marks
		(OR)		
2	a)	Explain the various classifications of transducers and list out the factor for selection of transducer.	CO1	8 Marks
	b)	Explain the working principle of resistive hygrometer.	CO2	6 Marks
		UNIT-II		
3	a)	Explain the frequency response of capacitive sensors.	CO1	6 Marks
	b)	Explain the principle of working construction and characteristic of Linear variable differential transformers.	CO3	8 Marks
		(OR)		
4	a)	Analyze the principle of electromagnetic sensors.	CO2	6 Marks
	b)	Explain the principle of working and construction and characteristic of Linear rotary differential capacitance sensor.	CO3	8 Marks
		UNIT-III		
5	a)	What are the properties of Piezolectric materials and mention its application?	CO5	7 Marks
	b)	Explain the operation and construction of photo-voltaic cell and what are the uses.	CO1	7 Marks
		(OR)		
6	a)	Describe the construction and operation of thermocouples.	CO4	8 Marks
	b)	Explain the magneto strictive transducers working principle.	CO3	6 Marks
		UNIT-IV		
7	a)	Distinguish between the shaft and optical encoders.	CO2	6 Marks
	b)	Explain the about the smart sensors.	CO1	8 Marks
		(OR)		
8	a)	Write a note on fiber-optic sensors.	CO1	6 Marks
	b)	Explain the Ultrasonic-based sensors.	CO6	8 Marks
		UNIT-V		
9	a)	Explain the principle of operation of chopper amplifiers.	CO5	7 Marks
	b)	Discuss about the noise present in charge amplifiers.	CO1	7 Marks
		(OR)		
10		Draw circuit diagram of instrumentation amplifier and explain its function. Also derive its gain equation.	CO3	14 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February – 2021

COMPUTER GRAPHICS AND MULTIMEDIA

[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Discuss in detail about the midpoint circle algorithm with the help of an example	CO3	8 Marks
	b)	What is meant by raster scanning? Discuss in detail about raster method for transformation.	CO1	6 Marks
		(OR)		
2	a)	Distinguish between seed filling and scan line filling algorithm.	CO1	8 Marks
	b)	Explain Bresenham's line drawing algorithm.	CO3	6 Marks

UNIT-II

3	a)	Explain the geometric transformation of the scaling rotation and translation.	CO4	8 Marks
	b)	Derive the transformation matrix for reflection about **y = mx + b**.	CO4	6 Marks
		(OR)		
4	a)	Express window-to-viewport mapping in the form of a composite transformation matrix	CO4	8 Marks
	b)	Write about polygon clipping with an example.	CO4	6 Marks

UNIT-III

5	a)	In how many ways splines could be represented? Show illustrations.	CO1	8 Marks
	b)	Demonstrate Bezier Curves with an example.	CO2	6 Marks
		(OR)		
6	a)	Explain the area division and Octree methods.	CO2	8 Marks
	b)	Derive the matrix form for the following basic geometric transformations in 3-D graphics: i) Rotation. ii) Mirror reflection.	CO3	6 Marks

UNIT-IV

7	a)	Differentiate between multimedia and hypermedia.	CO5	8 Marks
	b)	State the advantage of RIFF format.	CO1	6 Marks
		(OR)		
8	a)	Describe the different color spaces / models in detail.	CO1	8 Marks
	b)	Explain about various Graphics and Image Data Types.	CO2	6 Marks

UNIT-V

9	a)	Explain the significance of SNR and SQNR in a multimedia system.	CO2	8 Marks
	b)	Explain the video compression method in detail.	CO2	6 Marks
		(OR)		
10	a)	Compare lossless and lossy compression.	CO6	8 Marks
	b)	Differentiate between directory based and arithmetic coding.	CO5	6 Marks

CODE No.: 16BT51202 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

OBJECT ORIENTED ANALYSIS AND DESIGN

[Computer Science and Engineering, Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks

UNIT-I

1	a)	Explain the software development life cycle of object-oriented approach.	CO1	7 Marks
	b)	Explain the different among Bidirectional, Unidirectional and Reflexive Association.	CO1	7 Marks
		(OR)		
2	a)	Difference between class notation and object notation in UML.	CO1	7 Marks
	b)	What is the Object Modeling Techniques (OMT)?	CO1	7 Marks

UNIT-II

3	a)	What do you mean by class diagram? Where it is used and also discuss the steps to draw the class diagram with any one example.	CO2	7 Marks
	b)	Analyze and explain how to control the visibility of elements present in package.	CO2	7 Marks
		(OR)		
4	a)	Explain in detail the different activities involve in the design of view layer classes with an example of report generation system that shows the performance of student in various courses in his class.	CO1	7 Marks
	b)	Construct and explain the class diagram for library management system.	CO2	7 Marks

UNIT-III

5		Draw the use case model for the following system and explain. A computerized banking network includes both human cashiers and Automatic Teller Machines (ATM) to be shared by a consortium of banks. Each bank provides its own computer to maintain its own accounts and process transactions against them. Cashier stations are owned by individual banks and communicate directly with the bank computers. Human cashiers enter account and transaction data ATM accepts a cash card, interacts with the user, communicates with the central computer to carry out the transaction, dispenses the cash and prints receipts. The system requires appropriate record keeping and security provisions. The system must handle concurrent accesses to the same account correctly.	CO3	14 Marks
		(OR)		
6	a)	Illustrate with an example, the relationship between sequence diagram and use cases.	CO3	7 Marks
	b)	Explain what a domain model is and what function it fulfills.	CO3	7 Marks

UNIT-IV

7		Discuss the following concepts of activity diagrams with suitable examples. i) Transition. ii) Branching. iii) fork and join. iv) swim lanes.	CO4	14 Marks
		(OR)		

8		Write short notes on: i) Tagged values. ii) Concurrent substate. iii) Active objective. iv) Adornments. v) Events and signals.	CO4	14 Marks

UNIT-V

9	a)	Explain about the forward and reverse engineering.	CO5	7 Marks
	b)	Explain about the modeling executable files, libraries and tables and files and documents.	CO5	7 Marks

(OR)

10		Consider the application is assumed to be a web based application which is deployed in a clustered environment using server 1, server 2 and server 3. The user is connecting to the application using internet. The control is flowing from the caching server to the clustered environment. Draw the deployment diagram of order management system.	CO5	14 Marks

CODE No.: 16BT51203 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

WEB TECHNOLOGIES
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Differentiate XHTML and HTML5.	CO1, CO2	7 Marks
	b)	Discuss Form Elements.	CO1	7 Marks
		(OR)		
2	a)	Explain drag and drop features, offline web applications and web communication features.	CO1, CO2	7 Marks
	b)	Discuss the tags: i) font. ii) pre. iii) meta. iv) video.	CO1	7 Marks
		UNIT-II		
3	a)	Compare the features of CSS2 with CSS3.	CO1, CO2	7 Marks
	b)	What is CSS box model? Discuss with suitable example	CO1, CO2	7 Marks
		(OR)		
4	a)	What is the need of scripting? Write a script to check whether the given number is palindrome number or not.	CO4	7 Marks
	b)	What is recursive function? Write a recursive function to find the factorial of a given number.	CO4	7 Marks
		UNIT-III		
5	a)	What are the JQuery Selectors? Explain with suitable example.	CO5	7 Marks
	b)	Discuss the JQuery Events with example.	CO5	7 Marks
		(OR)		
6	a)	What are the advantages of Bootstrap?	CO5	7 Marks
	b)	Explain responsive images in Bootstrapping.	CO5	7 Marks
		UNIT-IV		
7	a)	Compare client side scripting and server side scripting.	CO3	7 Marks
	b)	Write a PHP Script to find the maximum of given n numbers.	CO1, CO4	7 Marks
		(OR)		
8	a)	Discuss PHP control structures.	CO1	7 Marks
	b)	Write a PHP function to compute m powered n (m^n).	CO1, CO4	7 Marks
		UNIT-V		
9	a)	Discuss cookie and session management in PHP.	CO3	7 Marks
	b)	Develop a PHP application which read employee information details from the HTML form and store this information in a database.	CO2, CO3	7 Marks
		(OR)		
10	a)	Discuss MySQL database transactions.	CO1, CO6	7 Marks
	b)	Design a simple PHP application which uses prepare statement.	CO1, CO6	7 Marks

❀ ❀ ❀

CODE No.: 16BT51241 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

OBJECT ORIENTED PROGRAMMING

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks

UNIT-I

1	a)	Describe various features of object oriented programming that are supported by Java language.	CO1	5 Marks
	b)	List out various types of constructors in Java language. Explain each of them with an example	CO1	9 Marks
		(OR)		
2	a)	Illustrate with an example, how methods are overloading in Java.	CO3	9 Marks
	b)	What is recursion? Write a program to find out the factorial of a given number using recursion.	CO1	5 Marks

UNIT-II

3	a)	Discuss about super keyword with an example.	CO3	8 Marks
	b)	What is meant by a package? Write the syntax for creating a package.	CO2	6 Marks
		(OR)		
4	a)	Create an interface with the methods void set( ) and void compute( ). Create a class with the variables length and breadth which implements this interface to find the area of rectangle.	CO3, CO6	9 Marks
	b)	What are the differences between abstract class and an interface?	CO3	5 Marks

UNIT-III

5	a)	Briefly explain the keywords try, catch and finally with their syntax.	CO1	6 Marks
	b)	Distinguish between throw and throws keyword with examples.	CO1, CO2	8 Marks
		(OR)		
6	a)	Discuss about the life cycle of a thread with a neat diagram.	CO1	7 Marks
	b)	Describe the mechanism employed in inter thread communication in Java.	CO1, CO2	7 Marks

UNIT-IV

7	a)	Discuss about Linked List class with an example.	CO2	6 Marks
	b)	Explain Applet Life Cycle and its methods with a neat sketch.	CO4	8 Marks
		(OR)		
8	a)	Create an Applet that reads username and password by passing parameters from HTML documents.	CO4	7 Marks
	b)	Create an applet that looks like a Login page using AWT Controls and print the information in the same Applet when the user submits the button.	CO4	7 Marks

UNIT-V

9	a)	Discuss about various event classes.	CO4	5 Marks
	b)	Illustrate with an example, how mouse events are handled in an Applet.	CO4	9 Marks
		(OR)		
10	a)	Describe the life cycle of a Servlet and the methods used in it	CO5	9 Marks
	b)	Discuss about how Cookies are handled inside a Servlet	CO5, CO6	5 Marks

CODE No.: 16BT51501 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

COMPILER DESIGN

[Information Technology, Computer Science and System Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks

		UNIT-I		
1	a)	How to classify the phases of a compiler? Briefly describe the phases with an illustration.	CO1	8 Marks
	b)	What is interpretation? What are the different kinds of interpreters? Explain.	CO1	6 Marks
		(OR)		
2	a)	What is the need and role of Lexical Analyzer? Describe the simple for the design of Lexical Analyzer.	CO1	7 Marks
	b)	Explain input buffering strategy used in Lexical analysis phase.	CO1	7 Marks
		UNIT-II		
3	a)	Give the rules for constructing FIRST( ) and FOLLOW( ) terms.	CO3	4 Marks
	b)	Check whether the following grammar is LL(1) grammar or not? S → iCtS S → iCtSeS S → a C → b	CO3	10 Marks
		(OR)		
4	a)	Construct the SLR parsing table for the ambiguous grammar E → E+E | E*E | (E) | id	CO3	10 Marks
	b)	How to eliminate Left recursion from the grammar?	CO3	4 Marks
		UNIT-III		
5	a)	Define Syntax directed definition. What are S attributed and L attributed definitions?	CO4	7 Marks
	b)	Define syntax trees. How to construct a syntax tree? Describe.	CO4	7 Marks
		(OR)		
6	a)	Write a note on the specification of a simple type checker using example.	CO4	6 Marks
	b)	What is a type expression? Explain the equivalence of type expressions with an appropriate example.	CO4	8 Marks
		UNIT-IV		
7	a)	Write the Syntax Directed Translation for flow control statements.	CO4	7 Marks
	b)	What are the different kinds of storage allocation strategies? Explain.	CO6	7 Marks
		(OR)		
8	a)	What are the different kinds of data structures used for symbol table? Explain.	CO6	8 Marks
	b)	Explain the usage of Simple Stack Allocation Scheme.	CO6	6 Marks
		UNIT-V		
9	a)	Define Basic Block and Flow Graph.	CO2	6 Marks
	b)	Write a note on Data Flow analysis.	CO2	8 Marks
		(OR)		
10	a)	Write the simple code generation algorithm and explain with an example.	CO1	7 Marks
	b)	Write a brief note on peephole optimization.	CO2	7 Marks

❀ ❀ ❀

CODE No.: 16BT51502 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

SYSTEMS SOFTWARE

[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the architecture of UNIX operating system with a neat diagram.	CO1	7 Marks
	b)	Explain the following commands with all the options: i) wc. ii) rm. iii) ls. v) mv. vii) cat.	CO1	7 Marks
		(OR)		
2	a)	Discuss various features of UNIX operating system.	CO2	7 Marks
	b)	Explain the commands used for mailing system in UNIX.	CO1	7 Marks

UNIT-II

3		Give overview of the UNIX file subsystem.	CO2	14 Marks
		(OR)		
4	a)	Implement 'cp' command in UNIX using system calls.	CO3	7 Marks
	b)	Explain 'DUP' system call and show the entries in data structures after execution of DUP with a neat diagram.	CO4	7 Marks

UNIT-III

5		Explain the process state model for UNIX and state transitions.	CO4	14 Marks
		(OR)		
6	a)	When kernel saves the context of a process? Write an algorithm for handling interrupts.	CO3	7 Marks
	b)	List the entries of a region table and describe the kernel operations to manipulate process address space.	CO3	7 Marks

UNIT-IV

7	a)	Write an algorithm for FORK system call.	CO4	7 Marks
	b)	Explain process termination in UNIX.	CO4	7 Marks
		(OR)		
8	a)	Explain use of Exec system with an example 'C' program.	CO4	7 Marks
	b)	Write a 'C' program to change the size of process.	CO4	7 Marks

UNIT-V

9	a)	What are the features of Transmission Control Protocol/Internet Protocol? Explain.	CO2	7 Marks
	b)	Discuss about MAC and IP addresses that can be used by TCP/IP.	CO2	7 Marks
		(OR)		
10	a)	Briefly explain Domain Name System (DNS).	CO2	7 Marks
	b)	Write short note on partitions in UNIX and explain how to create file system in UNIX.	CO3	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

MODELING AND SIMULATION

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	List and explain the advantages and disadvantages of simulation.	CO1	8 Marks
	b)	Write a short note on list processing.	CO1	6 Marks
		(OR)		
2	a)	Explain queuing simulation in a spread sheet.	CO2	8 Marks
	b)	Illustrate simulation environments.	CO6	6 Marks
		UNIT-II		
3	a)	A bus arrives every 20 minutes at a specific stop beginning at 6.40 A.M. and continuing until 8.40 A.M. A certain passenger does not know the schedule, but arrives randomly (uniform distributed) between 7.00 A.M and 7.30 A.M. every morning. What is the probability that the passenger waits more than 5 minutes for a bus?	CO2	7 Marks
	b)	With suitable example, explain about exponential distribution.	CO4	7 Marks
		(OR)		
4	a)	Explain Poisson Process along with its properties.	CO4	9 Marks
	b)	Write about empirical distributions.	CO4	5 Marks
		UNIT-III		
5	a)	Explain queue behavior and queue discipline and list queuing notation for parallel server systems.	CO3	8 Marks
	b)	List the steady state parameters of M/G/1.	CO4	6 Marks
		(OR)		
6	a)	Name and explain some of the useful statistical models for queuing system.	CO6	8 Marks
	b)	What is network of queue? Mention the general assumption for a stable system with infinite calling population.	CO2	6 Marks
		UNIT-IV		
7	a)	What are pseudo random numbers? What are the problems that occur while generating pseudo random numbers? Also list the important considerations during generation of random numbers.	CO4	8 Marks
	b)	Explain acceptance – rejection technique for Poisson distribution.	CO3	6 Marks
		(OR)		
8	a)	Generate 5 Poisson variates with mean $\alpha = 0.25$. Random numbers are: 0.073, 0.693, 0.945, 0.739, 0.014 and 0.342.	CO4	7 Marks
	b)	Explain with an example, importance of data distribution using histogram.	CO6	7 Marks
		UNIT-V		
9	a)	What is Time Series input model? Explain AR(1) and EAR(1) model.	CO4	7 Marks
	b)	Explain verification of simulation model with a neat diagram.	CO5	7 Marks
		(OR)		
10	a)	What do you understand by 'Goodness of Fit Test'? Write the procedure for the same.	CO3	7 Marks
	b)	Differentiate between terminating and steady state simulation with respect to output analysis with an example.	CO6	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

DIGITAL SIGNAL PROCESSING

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define a signal. Classify them with an example.	CO4	7 Marks
	b)	State and prove linearity, time shifting and symmetry properties of DFS.	CO2	7 Marks
		(OR)		
2	a)	Define stability of a system. Explain about BIBO stability criterion of a discrete system with an example.	CO2	7 Marks
	b)	Check the following systems for time variance causality, linearity and stability. i) $y(n) = x(n)+x(n-1)$. ii) $y(n) = n\,x(n)$.	CO4	7 Marks

UNIT-II

3	a)	Find the circular convolution of the sequences {1,-1,1,1} and {1,2,3,4,5}.	CO2	7 Marks
	b)	With a neat derivation explain the procedure to compute IDFT using Radix - 2 FFT.	CO1	7 Marks
		(OR)		
4	a)	Contrast the transforms DTFT, DFS and DFT.	CO1	7 Marks
	b)	An 8 point sequence is given by x(n) {1,2,3,4,4,3,2,1}. Compute 8 point DFT of x(n) by Radix - 2 DIF FFT	CO2	7 Marks

UNIT-III

5	a)	Convert analog filter into digital filter whose system unction is $H_a(s)=3/(s+3)(s+9)$ using impulse invariant method for T=1sec.	CO5	7 Marks
	b)	Derive an expression for order of the chebyshev analog proto type filter.	CO2	7 Marks
		(OR)		
6	a)	Design a digital low pass Butterworth digital IIR filter which is required to meet the following specifications by using bilinear transformation.. Pass band attenuation $\leq$ 2 dB, Pass band edge frequency = 4KHz. Stop band attenuation $\geq$ 40 dB, stop band edge frequency = 8KHz. Sampling rate = 24 KHz.	CO5	10 Marks
	b)	Obtain the direct form I and II form realization for the system $y(n) = -0.1y(n-1)+0.2y(n-2)+3x(n)+3.6x(n-1)+0.6x(n-2)$	CO2	4 Marks

UNIT-IV

7	a)	Explain designing of FIR filter using frequency sampling technique.	CO2	7 Marks
	b)	Realize the following FIR system described by equation using the direct form and linear phase structure. $H(z) = \frac{1}{4} + \frac{1}{2}z^{-1} + \frac{3}{4}z^{-2} + \frac{1}{2}z^{-3} + \frac{1}{4}z^{-4}$	CO3	7 Marks

(OR)

8	a)	Discus about characteristics of symmetric and anti-symmetric FIR filters.	CO3	7 Marks
	b)	Design a Linear phase band pass FIR filter with a cutoff frequencies in the range 0.4 π to 0.6π rad/sample by taking 7 samples of hamming window. Take N=11.	CO3	7 Marks

UNIT-V

9	a)	Discuss in detail bout pipelining of instruction execution in DSP processors.	CO1	7 Marks
	b)	What is meant by bit reversal address mode? Write the applications for which addressing are proffered.	CO1	7 Marks

(OR)

10	a)	Explain special addressing modes in Programmable DSPs.	CO1	7 Marks
	b)	What is the function of MAC unit used in DSP? Explain any two methods used to avoid over flow and underflow.	CO1	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

IMAGE PROCESSING

[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks

UNIT-I

1	a)	How is Digital Image formed? Write the digital image representation.	CO1	7 Marks
	b)	Differentiate between spatial and gray-level resolution.	CO2	7 Marks
		(OR)		
2	a)	What is an image transform? Discuss in detail about Walsh transform and Haar transform.	CO2	8 Marks
	b)	Determine the kernel coefficients of Hadamard transforms for $N = 8$.	CO4	6 Marks

UNIT-II

3	a)	Develop homomorphic filtering approach for image enhancement and derive necessary equations.	CO3	8 Marks
	b)	What is meant by Histogram of an image? Explain about Histogram specification method.	CO2	6 Marks
		(OR)		
4	a)	Develop the first order and second order derivatives in an image for edge Detection.	CO3	8 Marks
	b)	Explain the concept of Gray-level slicing and bit-plane slicing.	CO2	6 Marks

UNIT-III

5	a)	Explain the following order-statistics filters. i) max and min filters. ii) median filter. iii) alpha-trimmed mean filter.	CO2	8 Marks
	b)	Explain about linear position invariant degradation.	CO1	6 Marks
		(OR)		
6	a)	Derive expression for Wiener filter for image restoration using minimum mean square approach.	CO4	8 Marks
	b)	Discuss about unconstrained, constrained restorations.	CO1	6 Marks

UNIT-IV

7	a)	What is the image compression system model? Draw the block diagram and explain functions of its components.	CO1	8 Marks
	b)	With a neat block diagram, explain the lossy predictive coding technique.	CO2	6 Marks
		(OR)		
8	a)	Draw the block diagram of transform based image compression system and explain about each block.	CO1	8 Marks
	b)	Explain the symbol based coding technique for image compression.	CO2	6 Marks

UNIT-V

9	a)	What is the importance of YIQ color model? Explain.	CO1	6 Marks
	b)	Discuss the procedure for conversion from HSI to RGB color model.	CO1	8 Marks
		(OR)		
10	a)	Discuss about local and global Thresholding techniques for image segmentation.	CO1	8 Marks
	b)	Distinguish between region based segmentation and edge based segmentation.	CO2	6 Marks

CODE No.: 16BT60503 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

WIRELESS NETWORKS
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	With a neat sketch, explain medium access mechanism in GSM and DECT systems.	CO1	8 Marks
	b)	Differentiate PCS and Cellular systems.	CO1	6 Marks
		(OR)		
2	a)	Describe in detail about IP Telephony.	CO1	10 Marks
	b)	What is near-far problem? Explain with an example.	CO1	4 Marks
		UNIT-II		
3	a)	Suppose there are 7 frequency channels namely A, B, C, D, E, F, G available. Draw the hexagonal cellular architecture with a cluster size of N = 7.	CO4	4 Marks
	b)	How are secret-key and public-key algorithms different?	CO2	10 Marks
		(OR)		
4	a)	With a neat sketch, explain the handoff management process in wireless networks.	CO2	7 Marks
	b)	Describe the challenge response scheme in cellular networks.	CO2	7 Marks
		UNIT-III		
5	a)	Write in detail about the wireless solutions for home networking.	CO5	7 Marks
	b)	Give the physical specification summary of the DSSS, FHSS used by the IEEE 802.11.	CO3	7 Marks
		(OR)		
6	a)	Discuss about the IEEE 802.11 MAC management sub layer.	CO1	10 Marks
	b)	Explain the implementation of the CCK for IEEE 802.11b.	CO3	4 Marks
		UNIT-IV		
7	a)	With a neat sketch, explain the reference architecture of GSM system.	CO5	10 Marks
	b)	Write the procedure for registering a MS with the network.	CO5	4 Marks
		(OR)		
8	a)	Discuss in detail about the forward traffic channels of IS-95 system.	CO5	7 Marks
	b)	Analyze the packet transfer on uplink and downlink channels in GPRS network.	CO5	7 Marks
		UNIT-V		
9	a)	Describe the protocol entities in an ATM environment for wireless mobility.	CO6	7 Marks
	b)	Write about the requirements and architecture of HIPERLAN-1.	CO1	7 Marks
		(OR)		
10	a)	Explain the layers in protocol stack of Bluetooth.	CO5	7 Marks
	b)	How physical layer is implemented in HIPERLAN-2 transmission system?	CO1	7 Marks

CODE No.: 16BT3HS02 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August - 2021

MANAGERIAL ECONOMICS AND PRINCIPLES OF ACCOUNTANCY
[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Define "Managerial Economics". Explain its nature and scope. CO1 14 Marks

(OR)

2 What is demand forecasting? How is demand forecasting key for success of an enterprise? CO3, CO4 14 Marks

UNIT-II

3 Elucidate law of diminishing marginal returns. CO1 14 Marks

(OR)

4 Differentiate between: CO1, CO2 14 Marks
i) Opportunity Costs ***Vs*** Outlay Costs.
ii) Seperable Costs ***Vs*** Joint Costs.

UNIT-III

5 Define "Market". Explain features of perfect markets. CO1 14 Marks

(OR)

6 Distinguish between Price Discrimination and Product Differentiation. CO2 14 Marks

UNIT-IV

7 Elucidate various accounting concepts and conventions. CO1 14 Marks

(OR)

8 Journalize the following transactions in the books of Mr. Madhusudan. CO2, CO5, CO6 14 Marks

		Rs.
01.07.2019	Cash brought into business	60,000
	Sold goods to Ashok	8,000
03.07.2019	Bought stock from Siva	3,000
04.07.2019	Purchased Computer by cheque	20,000
06.07.2019	Withdrawn cash for domestic use	1,000
08.07.2019	Furniture purchased	4,000
11.07.2019	Returned goods to Siva	800
14.07.2019	Ashok returned goods	500
21.07.2019	Deposited cash in bank	20,000
28.07.2019	Paid rent	4,500
29.07.2019	Cash withdrawn from bank for office use	7,000
31.07.2019	Paid wages and salaries	4,800 and 12,000 respectively

UNIT-V

9 From the following balances of accounts in the books of M/s Kavitha, Prepare Trading, Profit and loss account for the year ending March 31st, 2018 and also Prepare balance sheet as on that date taking into account the following. CO4, CO5, CO6 — 14 Marks

Particulars	Amount (Rs.)	Particulars	Amount (Rs.)
Capital	450,000	Salaries	75,000
Sales	1,000,000	Commission (Dr)	15,000
Purchases	400,000	Interest (Dr)	10,000
Sales Returns	10,000	Gas, Water and Power	30,000
Purchases returns	15,000	Loan form HARS	50,000
creditors	200,000	Bills Receivable	120,000
Debtors	300,000	Bills Payable	25,000
Opening Stock	90,000	Electricity	16,000
Machinery	600,000	Wages	14,000
Furniture	100,000	Commission (Cr)	40,000

Adjustments:

i) Prepaid salaries Rs.2,000.
ii) Commission yet to be received Rs.4,000.
iii) Closing stock Rs.2,00,000/-
iv) Charge depreciation @ 10% on Machinery @ 15 % on Furniture.

(OR)

10 Compare and contrast between "Manual Accounting ***Vs*** Computerized Accounting". CO1, CO2 — 14 Marks

CODE No.: 16BT5HS02 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August - 2021

COSTING AND FINANCE MANAGEMENT FOR CIVIL ENGINEERS

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Examine the cost prediction with your own examples. CO1 14 Marks

(OR)

2 Differentiate between preliminary estimation and detailed estimation. CO2, CO4 14 Marks

UNIT-II

3 Explain the contract costing and its significance. CO1 14 Marks

(OR)

4 The following was the expenditure on a contract for Rs.6,00,000 commenced in January, 2020: CO1, CO4 14 Marks

Materials	Rs.1,20,000;
Wages	Rs.1,64,400;
Plant	Rs.20,000;
Business Charges	Rs.8,600.

Cash received on account to 31st December, 2020 amounted to Rs.2,40,000 being 80 per cent of work certified; the value of materials in hand as on 31-12-2020 was Rs.10,000. Prepare the Contract Account for 2020 showing the profit to be credited to the year's Profit and Loss Account. Plant is to be depreciated at 10%.

UNIT-III

5 What is budgetary control? State the main objectives of budgetary control, while explaining the main steps in budgetary control. CO1 14 Marks

(OR)

6 What is Cash Budget? Enumerate its advantages and describe its preparation. CO1 14 Marks

UNIT-IV

7 "Capital budgeting decisions are irreversible". Justify CO2, CO3 14 Marks

(OR)

8 A firm has many projects. It wants to earn at least 6% per annum on this project with the following cash flows. Do you recommend under NPV Criteria? CO3, CO4 14 Marks

Year end	0	1	2	3	4	5	6
Cash inflow	--	---	30,000	40,000	40,000	40,000	50,000
Cash outflow	1,00,000	20,000	--	--	--	--	--

UNIT-V

9 Define working capital. Explain its concepts. CO1 14 Marks

(OR)

10 How does trade credit play a major role in determining working capital? CO2, CO3 14 Marks

CODE No.:16BT40406 SVEC16 (RA)

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC16) Supplementary Examinations August – 2021

PULSE AND DIGITAL CIRCUITS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain in detail about attenuators.	CO1	7 Marks
	b)	Describe how a Compensated Attenuator improves the unsatisfactory response of a simple Attenuator.	CO2	7 Marks
		(OR)		
2.	a)	Derive an expression for the percentage tilt of the output of a high-pass RC circuit with large time constant excited by a symmetrical square wave with zero average value.	CO1	10 Marks
	b)	How a High Pass RC circuit acts as a Differentiator?	CO2	4 Marks

UNIT-II

3.	a)	What is synchronized clamping?	CO2	7 Marks
	b)	State and prove clamping circuit theorem.	CO1	7 Marks
		(OR)		
4.	a)	What are the limitations of diode as a shunt element in clipping circuits?	CO3	7 Marks
	b)	Explain the operation of a comparator circuit.	CO2	7 Marks

UNIT-III

5.	a)	Identify and Apply appropriate multi-vibrating technique to convert any signal to square signal, using two transistors.	CO5	7 Marks
	b)	Determine the frequency of oscillations and duty cycle for an Astable multi-vibrator with R_1=15kΩ, R_2=10kΩ, C_1= 0.01μF and C_2= 0.015μF.	CO4	7 Marks
		(OR)		
6.	a)	Draw the neat circuit diagram of a collector - coupled monostable multivibrator and explain its operation with the help of waveforms.	CO1	8 Marks
	b)	Draw and explain about the response of Schmitt circuit for: i) loop gain ≤1. ii) loop gain >1.	CO3	6 Marks

UNIT-IV

7.	a)	How to generate sweep voltage using Bootstrap principle?	CO3	7 Marks
	b)	Explain in detail about the operation of current sweep circuit.	CO5	7 Marks
		(OR)		
8.	a)	Define the terms slope error, displacement error and transmission error. How are they related for an exponential sweep circuit? Define the relation between them.	CO1	8 Marks
	b)	With the help of a neat circuit diagram, explain the working of a transistor current time- base generator.	CO2	6 Marks

UNIT-V

9.	a)	Explain the basic operating principle of sampling gates.	CO1	7 Marks
	b)	Implement NOR gate using CMOS logic.	CO2	7 Marks
		(OR)		
10.	a)	In a four diode sampling gate, obtain larger value of $(V_c)_{min}$ that improves linearity in addition to safety.	CO6	6 Marks
	b)	Implement NAND gate using CMOS logic.	CO2	8 Marks

❀ ❀ ❀

CODE No.: 16BT41204 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August - 2021

THEORY OF COMPUTATION
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

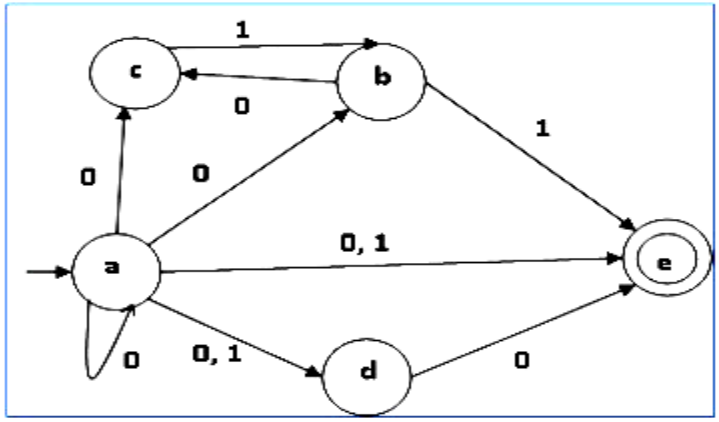
UNIT-I

1 Convert the following Moore machine into Melay machine CO1 14 Marks

Present State	Next Sate		Output
	0	1	
→ q0	q10	q20	0
q10	q10	q21	0
q11	q10	q21	1
q20	q11	q20	0
q21	q11	q20	1

(OR)

2 a) Convert the following NFA to a DFA CO1 10 Marks

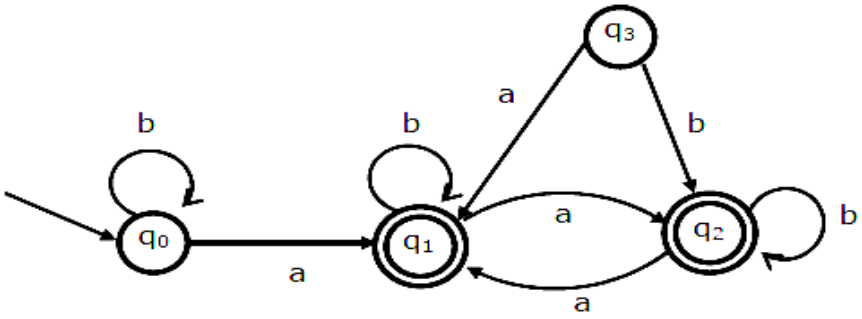


b) Differentiate NFA and DFA. CO2 4 Marks

UNIT-II

3 a) Construct FA equivalence to the following regular expression. CO3 7 Marks
$r = 01[((10)^*+111)^*+0]^*1$.

b) Construct the regular expression accepted by following finite automaton. CO3 7 Marks



(OR)

4 a) Construct a DFA for the regular expression 10 + (0+11) 0*1 and optimize the states. CO3 8 Marks

b) Show that the set $\{a^{i2}\}$ is not regular. State and explain the theorem used. CO3 6 Marks

UNIT-III

5		Construct equivalent grammar in Chomsky Normal Form for the grammar $G=(\{S,A,B\},\{a,b\}, \{S\rightarrow aAbB, A\rightarrow aA\|a, B\rightarrow bB\|b\}, S\}$.	CO3	14 Marks

(OR)

6	a)	Construct parse trees, left most and right most derivations to the input string $w=a*(a+b00)$ for the following grammar. $E\rightarrow I\|E+E\| E*E\| (E)$ $I\rightarrow$a| b| Ia| Ib| I0| I1	CO1	7 Marks
	b)	Explain the following terms. i) CFG. ii) Ambiguous grammar. iii) Sentential form. iv) Parse tree.	CO1	7 Marks

UNIT-IV

7	a)	Define PDA. Give an example for a language accepted by PDA by empty stack.	CO1	10 Marks
	b)	Explain properties of Context Free Languages.	CO1	4 Marks

(OR)

8	a)	Explain in detail about the model of Linear Bounded Automata.	CO1	8 Marks
	b)	Construct a PDA that recognizes the language $\{aibjck\| I, j, k>=i=j$ or $i=k\}$.	CO3	6 Marks

UNIT-V

9		Design a Turing Machine to recognize the language $L=\{1^n2^n3^n\| n \geq 1\}$.	CO4	14 Marks

(OR)

10		Design a Turing Machine which can multiply two positive integers.	CO1	14 Marks

CODE No.: 16BT50101 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August - 2021

IRRIGATION ENGINEERING
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What do you understand by the term irrigation? Discuss the necessity of irrigation in a tropical country like India.	CO1	7 Marks
	b)	Compute the depth and frequency of irrigation required for a certain crop with data given below. Root zone depth = 100cm, wilting point = 12%, field capacity = 22%, consumptive use = 25mm/day, apparent specific gravity of soil=1.5, efficiency of irrigation = 50%. Assume 50% depletion on available moisture before application of water at field capacity.	CO3	7 Marks
		(OR)		
2	a)	List out objectives of irrigation. Discuss the advantages and ill effects of irrigation.	CO1	7 Marks
	b)	A water course has a culturable command area of 1000 hectares. The intensity of irrigation for crop A is 40% and for crop B is 45%, both the crops being rabi crops. Crop A has a kor depth of 150mm and kor period 3 weeks and crop B has a kor depth of 100mm and kor period 2 weeks. Calculate the discharge of the water course.	CO4	7 Marks

UNIT-II

3	a)	Sketch the layout of a typical diversion head works and briefly discuss the functions of the various components of diversion head works.	CO2	7 Marks
	b)	Define diversion head work and mention the functions of diversion head work.	CO2	7 Marks
		(OR)		
4	a)	Define silt excluder and explain the working and design considerations with a neat sketch.	CO3	7 Marks
	b)	Explain the importance of exit gradient and how do you check the exit gradient.	CO2	7 Marks

UNIT-III

5	a)	Define gravity dam and discuss the components of gravity dam with a neat sketch.	CO1	7 Marks
	b)	Classify dams and discuss each in detail.	CO2	7 Marks
		(OR)		
6	a)	Briefly describe an ogee spillway and its components with a neat sketch and discuss its necessity.	CO2	7 Marks
	b)	What is an ogee spillway and how it is designed?	CO3	7 Marks

UNIT-IV

7	a)	What is a canal fall and why is it required to provide in a canal?	CO1	7 Marks
	b)	Classify falls and explain the suitability of location of falls.	CO2	7 Marks
		(OR)		

8	a)	Discuss the requirements of a good outlet.	CO2	7 Marks
	b)	Distinguish between:	CO1	7 Marks
		i) modular. ii) semi modular.		
		iii) non-modular outlets with a neat sketch.		

UNIT-V

9	a)	What are the features to be considered while designing of cross drainage works?	CO3	7 Marks
	b)	Explain the method of fixing the waterway of drain in an aqueduct.	CO5	7 Marks
		(OR)		
10	a)	Classify river training works and discuss any one in detail.	CO2	7 Marks
	b)	Discuss the relative merits and demerits of river training by embankments.	CO1	7 Marks

CODE No.: 16BT50102 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

REINFORCED CEMENT CONCRETE STRUCTURES
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	Design a reinforced beam of rectangular section using the following data: Effective span = 5m, Width of the span = 250mm, Overall depth= 500mm, Service load (D.L+ L.L) = 40 KN/m^2, Effective cover = 50mm Materials: use M20 concrete and Fe415 steel bars.	CO3	14 Marks
	(OR)		
2	Identify the depth of neutral axis and ultimate moment of resistance of T beam section for the following data. Flange width = 800mm, Flange thickness = 150mm, Web width = 300mm. Effective depth = 420mm. Area of tension reinforcement = 14701 mm^2. Assume = M 25 grade concrete and Fe 415 grade steel.	CO2	14 Marks

UNIT-II

3	An RCC beam 300mm wide and 500mm deep is reinforced with 4 bars of 16mm dia of grade Fe415 on tension side. If design shear force is 80 kN, design the shear reinforcement consisting only of vertical stirrups. The grade of concrete used is M20.	CO3	14 Marks
	(OR)		
4	Design a cantilever beam of uniform depth for a span of 2.9m, if the superimposed load is 22 kN/m and it is monolithic with R.C column of 300mm width and 400mm deep. Use M20 grade concrete and Fe415 steel.	CO3	14 Marks

UNIT-III

5	A simply supported slab has a clear span of 2.1m and is supported on walls 400mm thick along edges. If the live load on the slab 4 kN/m^2, and the floor finish weighs 0.6 kN/m^2. Design the slab using M20 grade concrete and Fe 415 HYSD bars.	CO3	14 Marks
	(OR)		
6	Design a simply supported RCC slab for an office floor having clear dimensions of 4m x 10m with 230mm walls all around. Adopt M 20 grade concrete and Fe 415 grade HYSD bars.	CO3	14 Marks

UNIT-IV

7	Determine the ultimate load carrying capacity of rectangular column section 400 x 600mm reinforced with 10nos. of 25mm dia. Use M25 concrete and Fe415 steel.	CO3	14 Marks
	(OR)		
8	A short rectangular column having an effective length of 3m carries a factored axial compressive load of 2000 kN. Architectural requirements dictate the column size as 600 x 450mm. Design the column using M20 concrete and Fe 415 steel.	CO3	14 Marks

UNIT-V

9	a)	Write down the different types of footings and their suitability.	CO1	7 Marks
	b)	Enumerate the procedure for the design of combined rectangular footing for two columns only	CO1	7 Marks

(OR)

10		Design a combined footing for the two columns at a multi-storey building. The columns of size 400mm x 400mm transmit a working load of 300KN each and they are spaced at 5m centers. The safe bearing capacity of soil at site is 200KN/m^2. Adopt M20 grade concrete and Fe415 grade steel. Sketch the details of reinforcements in the combined footing.	CO3	14 Marks

CODE No.: 16BT50103 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC16) Supplementary Examinations August – 2021

SOIL MECHANICS
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Derive the relation between unit weight (γ), degree of saturation (S), void ratio (e) and unit weight of water (γ_w).	CO2	6 Marks
	b)	The mass of a moist sample collected from the field is 645 g, and its oven dry mass is 405.76 g. If G = 2.68 and the void ratio of the soil in the field is 0.83, determine: i) moist density in the field. ii) dry density in the field. iii) amount of water to be added per m^3 of soil in the field for saturation. iv) saturated density.	CO2	8 Marks

(OR)

2	a)	Define and explain: Liquid limit; Plastic limit; Shrinkage limit; and Plasticity index. Briefly describe the procedure to determine the liquid limit of a soil by Casagrande's method.	CO4	6 Marks
	b)	A soil has a liquid limit of 45%, plastic limit of 20% and flow index of 50%. Determine its toughness index. If the natural water content is 25%, comment on the state of its consistency. Also, classify the soil as per IS Classification if the fraction passing through 75 micron sieve is 60%.	CO7	8 Marks

UNIT-II

3	a)	What is flow net? Explain the properties and uses of flow net.	CO1	6 Marks
	b)	For a homogeneous earth dam 52m high and 2m free board, a flow net was constructed and following results were obtained. No. of potential drops = 25 No. of flow channels = 4 The dam has a horizontal filter of 40m length at its downstream end. Calculate the discharge per metre length of the dam if the coefficient of permeability of the dam material is 3×10^{-3} cm/sec.	CO2	8 Marks

(OR)

4	a)	Illustrate the method of determination of coefficient of permeability for cohesive soils.	CO4	6 Marks
	b)	In a falling head permeability test on a soil of length L1, the head of water in the stand pipe takes 5 seconds to fall from 900 to 135mm above the tail water level. When another soil of length 60mm is placed on the first soil, the time taken for the head to fall between the same limits is 150 seconds. The permeameter has a cross sectional area of $4560mm^2$ and stand pipe area of $130mm^2$. Calculate the permeability of second soil.	CO2	8 Marks

UNIT-III

5	a)	What are the assumptions and limitations made in Boussinesq's theory?	CO1	6 Marks
	b)	A circular ring footing for an overhead water tank carries a load of 1000kN whose outer diameter is 3m and inner diameter is 1.5m. Determine the induced stress at a depth of 3m from surface below the centre of the loaded area.	CO2	8 Marks

(OR)

6 a) What are the field methods for compacting soils? Discuss the suitability of different methods with respect to the soil type. CO1 6 Marks

b) A proposed embankment fill requires 5000m^3 of compacted soil. The void ratio of compacted fill is specified as 0.70. Four borrow area soils are available as described in the following table. CO3 8 Marks

Borrow area	Void ratio	Cost of transportation Rs./m^3
A	0.85	450
B	1.20	300
C	0.95	350
D	0.75	500

Make the necessary calculations to select the borrow area from which the soil should be brought to minimize the cost. Let specific gravity of all four soils equal to 2.70.

UNIT-IV

7 a) Describe a method to determine the pre-consolidation pressure of soil with a neat sketch and explain its significance. CO8 7 Marks

b) A layer of clay 8m thickness is located between two sand layers. The coefficient of consolidation of the clay is $5x10^{-2}$ nm^2/sec. The fill material was placed over a very large area above the top sand layers. After 3 years, what percentage of the additional pressure due to the fill material will be carried by the soil grains at the middle of the clay layer? CO2 7 Marks

(OR)

8 a) Distinguish between normally consolidated and over consolidated soil. CO2 5 Marks

b) A clay soil, tested in a consolidometer showed a decrease in void ratio from 1.20 to 1.10 when the pressure was increased from 25 kN/m^2 to 50 kN/m^2. Calculate the coefficient of compressibility and the coefficient of volume compressibility. If the coefficient of consolidation determined in the test for the given stress increment was 10m^2 / year, calculate the coefficient of permeability in cm/s. If the sample tested at the site was taken from a clay layer 3.0m in thickness, determine the consolidation settlement resulting from the given stress increment. CO2 9 Marks

UNIT-V

9 a) Discuss the relative advantages and disadvantages of the direct shear test over the triaxial compression test. How are triaxial tests classified based on drainage conditions? CO2 6 Marks

b) The results for triaxial tests conducted on three samples of a soil are given below. Obtain the shear strength parameters of the soil. CO2 8 Marks

Cell pressure (kN/m^2)	100	200	450
Deviator stress (kN/m^2)	375	575	973

(OR)

10 A consolidated undrained triaxial test was conducted on saturated clay. When the confining pressure was 200 kN/m^2, the sample failed at a deviator stress of 500kN/m^2. The pore water pressure was 150kN/m^2. The failure plane occurred at an angle of 60^o to the horizontal. CO2 14 Marks

i) Determine the normal and shear stresses on the failure plane at failure. Also calculate the maximum shear stress.

ii) If the same specimen were tested in a drained test with a confining pressure of 200 kN/m^2, what would have been the deviator stress at failure? Take c = 44 kN/m^2.

CODE No.: 16BT50104 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August - 2021

STRUCTURAL ANALYSIS-II
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 As system of 5 loads 80kN, 160kN, 160kN, 60kN and 40kN crosses a beam of 15m span with the 80kN load leading. The distance between the loads are 2.4m, 3m, 2.4m and 1.8m respectively. Find the maximum bending moment at the center of the span. Also find the absolute maximum bending moment of the beam. CO2 14 Marks

(OR)

2 a) Write a short note on Equivalent Uniformly Distributed Load. CO1 4 Marks

b) A uniformly distributed load of 50 kN/m of 6m length crosses a girder of span 40m from left to right. With the help of influence lines, determine the values of shear force and bending moment at a point 12m from the left support, when the head of the load is 16m from the left support. CO2 10 Marks

UNIT-II

3 Analyse the continuous beam ABCD shown in Fig.1 by slope deflection method and draw the bending moment diagram. CO6 14 Marks

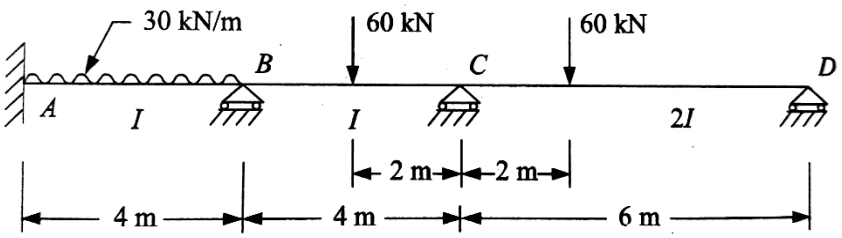


Fig.1

(OR)

4 Analyse the continuous beam shown in Fig.2 by moment distribution method, if support B sinks by 12mm. Given that E = 200 kN/mm^2 and I = 20 x 10^6 mm^4. CO4 14 Marks

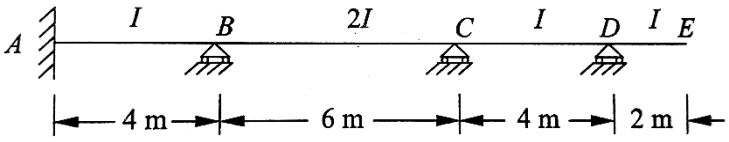


Fig.2

UNIT-III

5 Analyse the continuous beam shown in Fig.3 by Kani's method. CO4 14 Marks

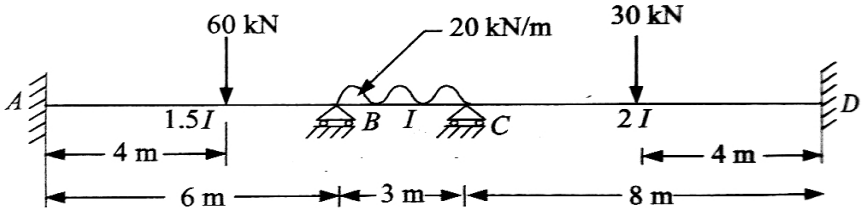


Fig.3

(OR)

6 Find the vertical deflection of joint B in the truss loaded as shown in Fig.4. The cross-sectional area of the members in mm^2 are shown in brackets. Take E = 200kN/mm^2. CO2 14 Marks

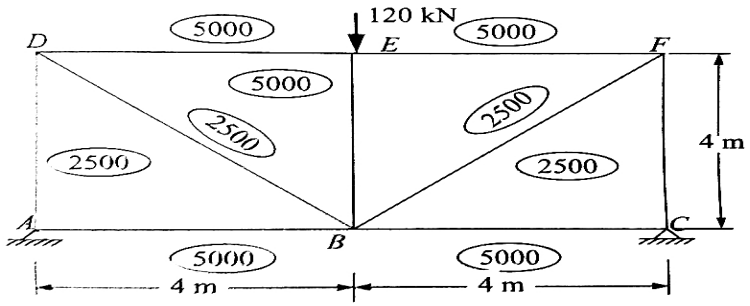


Fig.4

UNIT-IV

7 Find the stresses in all the members of the given frame as shown Fig.5, in which the cross sectional areas of vertical members are 3000mm^2 each and those of all other members are 2200mm^2. E=2x10^5 N/mm^2. CO4 14 Marks

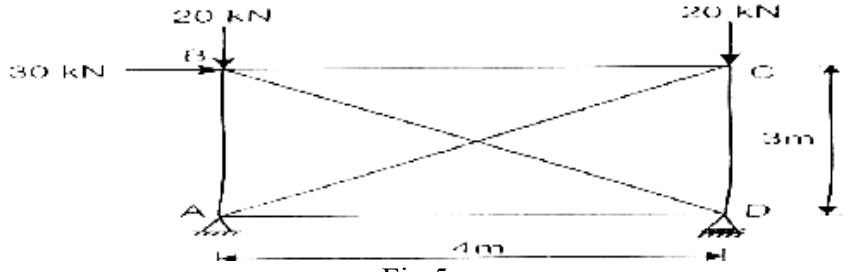


Fig.5

(OR)

8 Determine the forces in the members of the truss shown in Fig.6; AE is constant for all the Members. The member BC is 3.6m. CO4 14 Marks

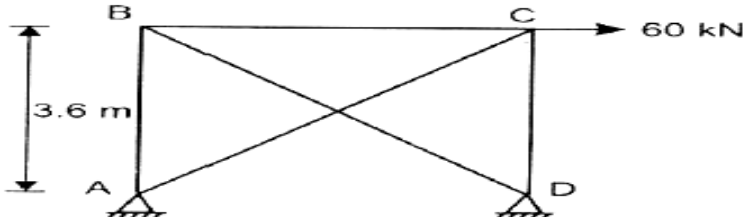


Fig.6

UNIT-V

9 a) Write the assumptions for evaluating fully plastic moment. And also derive fully plastic moment M_P and shape factor S in general. CO1 8 Marks

b) A T-section consists of a flange 150x10mm and a web of 140x10mm. The section modulus of the T-section is 54600mm^3. This section is used as a simply supported beam of 4m span and carries a UDL of 25kN/m on the whole span. Determine the shape factor of the beam and also calculate the collapse load for the beam. Assume yield stress as 250 Mpa. CO3 6 Marks

(OR)

10 Calculate the plastic moment capacity required for the continuous beam with working loads shown in Fig.7. CO3 14 Marks

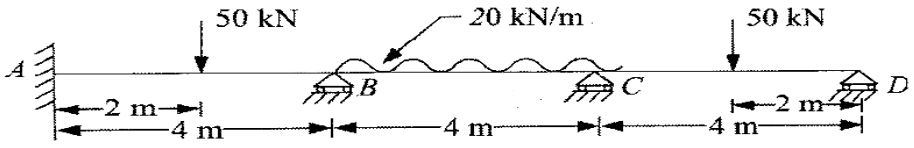


Fig.7

❀ ❀ ❀

CODE No.: 16BT50105 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August - 2021

WASTE WATER TECHNOLOGY
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain briefly effects of improper disposal of sewage	CO6	7 Marks
	b)	Calculate the combined flow discharge of sewage for the given data. Area to be served is 150 hectares. Population is 50,000. Time of entry and time of flow is 5 and 20 minutes respectively. Rate of water supply is 135 LPCD. Impermeability factor, C = 0.45. Assume 80% of water supplied turns into sewer and peak factor as 1.5.	CO3	7 Marks
		(OR)		
2	a)	Discuss briefly the necessity of replacing the conservancy system by the water carriage system.	CO1	7 Marks
	b)	What are the systems of plumbing? With help of a neat sketch, discuss various systems of plumbing used for drainage.	CO9	7 Marks

UNIT-II

3	a)	Design a primary sedimentation tank for a proposed sewage treatment plant of 120 MLD capacity.	CO3	7 Marks
	b)	Explain the Conventional treatment process of municipal wastewater treatment plant with flow diagram.	CO7	7 Marks
		(OR)		
4	a)	Design a screen channel for a peak sewage flow of 45MLD by using following data i) Size of bars is 15 x 50mm ii) Clear spacing between bars is 30mm. iii) Angle of inclination of screen with horizontal is 45º. iv) Dia of incoming sewer is 0.65m.	CO3	7 Marks
	b)	List out chemical characteristics of sewage and explain any three how importance in maintaining the standards for disposal.	CO8	7 Marks

UNIT-III

5	a)	Write the procedure for design of standard trickling filter.	CO1	7 Marks
	b)	Differentiate attached growth process and suspended growth process.	CO2	7 Marks
		(OR)		
6	a)	Describe in detail about an oxidation pond and oxidation ditch.	CO1	9 Marks
	b)	Design a standard trickling filter plant to treat 6 million liters of sewage per day having 5 day BOD of 160 mg/l. Assume suitable data where ever required.	CO3	5 Marks

UNIT-IV

7	a)	What is sludge conditioning and dewatering? Explain any one of the methods of sludge dewatering.	CO1	7 Marks
	b)	Sludge disposal to an onsite create lot of problems to the community. What are steps you suggest for the disposal and what is the mechanism involved in the process of removal of pathogenic bacteria from sludge.	CO5	7 Marks

(OR)

8	a)	Mention the various physical chemical processes used for the removal of nitrogen from sewage. Describe briefly each method.	CO1	5 Marks
	b)	Explain the process of removal of phosphorous and refractory organic materials.	CO2	9 Marks

UNIT-V

9	a)	Classify the various methods of sewage disposal.	CO1	7 Marks
	b)	Draw a typical oxygen sag curve and explain its meaning and state its importance in benefits of maintaining the DO in the river water for society.	CO9	7 Marks

(OR)

10	a)	Discuss various methods of disposal of septic tank effluent with neat sketches and recommendations in the design.	CO4	7 Marks
	b)	Design a septic tank with dispersion trench for 175 users. The rate of water supply is 70 LPCD. Assume suitable criteria as applicable. Draw a neat sketch of the unit.	CO3	7 Marks

CODE No.: 16BT50201 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC16) Supplementary Examinations August – 2021

CONTROL SYSTEMS

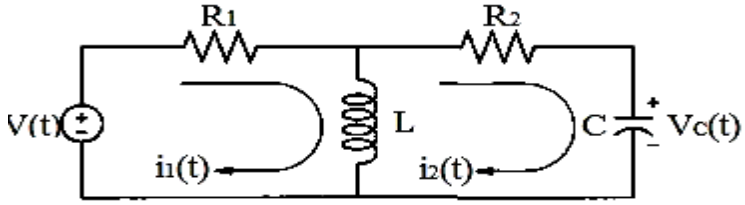
[Electrical and Electronics Engineering, Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Discuss the rules implemented for the reduction of a given block diagram	CO1	7 Marks
	b)	Compare open loop and closed loop control system performance.	CO2	7 Marks
		(OR)		
2	a)	State Mason's gain formula for deriving transfer function of a system.	CO1	6 Marks
	b)	Determine the transfer function, $\frac{I_2(s)}{V(s)}$ for the electrical system shown in figure below.	CO2	8 Marks



UNIT-II

3	a)	Derive the expression for the time response of an under damped second order system when subjected to unit step input.	CO2	7 Marks
	b)	A unity feedback system is characterized by the open-loop transfer function $G(s) = \frac{1}{s(0.3s+1)(0.1s+1)}$. Determine the steady-state errors for unit-step, unit-ramp and unit-acceleration inputs.	CO4	7 Marks
		(OR)		
4	a)	Sketch the root locus plot for a unity feedback system with an open loop transfer function $G(s) = \frac{K}{s(s+2)(s+4)}$.	CO5	7 Marks
	b)	Explain the Routh-Hurwitz criteria with an example.	CO2	7 Marks

UNIT-III

5		Sketch the Bode plot showing the gain magnitude in dB and phase angle in degrees as a function of log frequency for the transfer function $G(s)H(s) = \frac{2000}{s(s+2)(s+100)}$. Determine the gain crossover frequency, phase crossover frequency, gain margin and phase margin. Also, determine the gain and the corresponding phase margin for a gain crossover frequency of 50 rad/sec.	CO5	14 Marks
		(OR)		
6		Sketch the Nyquist plot and there from determine the stability of the closed-loop system whose open-loop transfer function is given by $G(s)H(s) = \frac{K(s+4)}{s^2(s+1)}$.	CO5	14 Marks

UNIT-IV

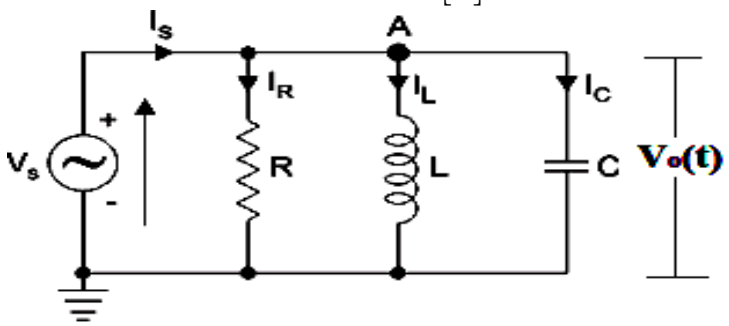
7	a)	Explain the effect of PI controller on time response characteristics of a second order system.	CO6	7 Marks
	b)	Briefly explain the types of compensators in design aspects of a control system in frequency response analysis.	CO1	7 Marks

(OR)

8		Consider the unity feedback system whose open loop transfer function is $G(s) = \frac{K}{S(S+1)(0.1S+1)}$. Design phase-lead compensator to meet the following specifications i) Velocity error constant, $K_v = 10\ S^{-1}$, ii) Phase Margin = 35^0.	CO3	14 Marks

UNIT-V

9		Obtain the state model for the electrical system shown in figure below. Also, find the solution for the state equation with R=5Ω, L=10mH and C=2μF. Assume initial state vector $X(0) = \begin{bmatrix} 0 \\ 1 \end{bmatrix}$.	CO4	14 Marks



(OR)

10	a)	Explain the Kalman's test for determining controllability and observability of a system.	CO1	7 Marks
	b)	Explain the concept of conversion of state model in to transfer function of a control system and vice versa.	CO1	7 Marks

CODE No.: 16BT50202 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

POWER ELECTRONICS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Develop a schematic diagram for connecting and disconnecting a DC voltage source to a Resistive load, using IGBT as a power switch. With the help of a neat sketch, explain its switching characteristics.	CO5	10 Marks
	b)	With the help of a neat sketch, explain switching characteristics of a power MOSFET.	CO1	4 Marks
		(OR)		
2	a)	Design a firing circuit for triggering an SCR subjected to 1-phase, 50Hz AC Voltage and can control its conduction over a period of 5ms, configured for multipurpose automatic illumination control applications.	CO6	10 Marks
	b)	Twenty SCRs each of 500V, 500A are used in Five columns and Four rows in a circuit of 2kV and 1.8 kA. Calculate Voltage and Current de-rating factors.	CO4	4 Marks

UNIT-II

3	a)	Define extinction angle. List and explain the factors affecting extinction angle.	CO1	4 Marks
	b)	With the help of neat circuit diagram and necessary waveforms, analyze the operation of single phase fully controlled bridge rectifier with RL Load for firing angle delays $\alpha=30^o$ and 120^o by incorporating the variation of extinction angle.	CO2	10 Marks
		(OR)		
4	a)	List the advantages of freewheeling diode and explain how power factor can be improved by connecting it in anti- parallel across the RL-Load fed by a fully controlled rectifier.	CO1	6 Marks
	b)	Discuss the effect of source inductance on the performance of a three-phase fully controlled rectifier with RL load and sketch relevant waveforms.	CO1	8 Marks

UNIT-III

5	a)	Discuss the operational differences between circulating and non-circulating current modes of a single phase dual converter with R-load.	CO1	7 Marks
	b)	Derive the expressions for RMS values of output voltage and load current of a single phase AC voltage controller (employing SCRs) feeding R-load.	CO4	7 Marks
		(OR)		
6		Design a single phase, 230V, 50Hz bridge type cycloconverter scheme with RL-load to produce an output frequency of 250 Hz. Identify the method of commutation employed and sequence of firing pulses to be produced. With the help of a neat circuit diagram and relevant waveforms, explain its operation.	CO3	14 Marks

UNIT-IV

7	a)	Explain the principle of complimentary commutation technique with the help of neat circuit diagram and relevant waveforms.	CO1	7 Marks
	b)	Compare natural and forced commutation techniques and recommend suitable commutation type preferred for turning off a thyristor if used in a chopper circuit.	CO1, CO5	7 Marks
		(OR)		
8	a)	Explain the working of a step-down chopper with R-load and derive an expression for average value of output voltage.	CO1	7 Marks
	b)	Discuss current limit control strategy for a DC chopper.	CO1	7 Marks

UNIT-V

9		Explain the operation of a basic parallel inverter and draw relevant waveforms.	CO1, CO2	14 Marks
		(OR)		
10	a)	Compare sinusoidal pulse width modulation technique over multiple pulse width modulation technique and discuss.	CO1	8 Marks
	b)	A single phase half bridge inverter has a resistive load of 10Ω and input voltage of 100V. Determine: i) RMS output voltage at fundamental frequency. ii) average and peak currents of each thyristor. iii) the peak reverse blocking voltage of each thyristor.	CO4	6 Marks

CODE No.: 16BT50203 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August - 2021

SYNCHRONOUS MACHINES
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Discuss the importance of distributed armature winding in an alternator.	CO1	6 Marks
	b)	How the winding factors affect the waveform of generated **emf** of alternator? What steps are taken to eliminate third and fifth harmonic components of generated **emf**?	CO2	8 Marks
		(OR)		
2		Explain the following characteristics of an alternator: i) Open Circuit Characteristics. ii) Short Circuit Characteristics. iii) Zero Power Factor Characteristics.	CO1	14 Marks

UNIT-II

3	a)	Explain the two reaction theory of salient pole machine. Draw the phasor diagram and obtain regulation of an alternator using this theory.	CO1	8 Marks
	b)	A 70 MVA, 13.8 kV, 3-phase star connected salient pole alternator having X_d = 1.83Ω and X_q = 1.2Ω delivers at 0.8 p.f lagging. Neglecting the armature resistance, calculate: i) The excitation voltage (E_f). ii) The voltage regulation.	CO4	6 Marks
		(OR)		
4	a)	Describe the slip test method for measurement of X_d and X_q of synchronous machine.	CO1	6 Marks
	b)	An alternator has a direct-axis synchronous reactance of 0.8 per unit and quadrature-axis synchronous reactance of 0.5 per unit. Determine the per unit open-circuit voltage for full-load at a power factor of 0.8. Neglect saturation.	CO4	8 Marks

UNIT-III

5	a)	Discuss the load sharing between two alternators which are connected in parallel.	CO1	6 Marks
	b)	A shopping complex consists of a lighting load of 3000 kW and a motor load of 5000 kW at a pf of 0.72. Two alternators are connected in parallel to feed this load. One machine is loaded up to 5000kW at 0.8 pf lagging. Suggest the specifications required for other machine to share the remaining load.	CO3	8 Marks
		(OR)		
6	a)	Obtain an expression fort the natural frequency of undamped oscillation of the rotor of synchronous motor.	CO1	6 Marks
	b)	Show that the short circuit ratio of a synchronous generator is the reciprocal of per-unit value of synchronous reactance adjusted to saturation at rated voltage.	CO2	8 Marks

UNIT-IV

7	a)	Derive an expression for power developed in a 3-phase synchronous motor.	CO2	8 Marks
	b)	A 20kW, 400V, 3-phase, star-connected synchronous motor has per phase impedance of (0.15+j0.9) Ω. Determine the induced **emf**, torque angle and mechanical power developed for full load at 0.8 pf lagging. Assume 92% efficiency of the motor. Draw the phasor diagram.	CO4	6 Marks

(OR)

8	a)	Mention the role of a synchronous condenser in power transmission lines.	CO5	6 Marks
	b)	A 400V, 3-phase installation takes a current of 36A at 0.8 pf lagging. A synchronous motor improves the overall p.f. to 0.92 lagging. Simultaneously the synchronous motor drives a 15 HP load at an efficiency of 85%. Determine i) the power factor of the synchronous motor. ii) the leading kVAr supplied by the motor. iii) the kVA rating of the motor.	CO4	8 Marks

UNIT-V

9	a)	Explain why a single-phase single winding induction motor produces no starting torque.	CO1	6 Marks
	b)	What design features are incorporated in a split-phase motor to make it self-starting?	CO3	8 Marks

(OR)

10		Write a short notes on: i) Resistance split-phase motors. ii) Capacitor split phase motors. iii) Capacitor start and run split phase motors.	CO1	14 Marks

CODE No.: 16BT50204 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August - 2021

TRANSMISSION AND DISTRIBUTION
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Derive the expression for flux linkages due to internal flux and external flux for a single wire current carrying conductor.	CO2	6 Marks
	b)	Derive an expression for the inductance of a 3 phase overhead line.	CO2	8 Marks
		(OR)		
2	a)	List out the various properties of dielectric compounds to be used for insulation of cables. And explain the inter-sheath grading of cables.	CO6	7 Marks
	b)	A single core 11kV, 50Hz, 5km long cable has a core diameter of 1.5cm and diameter of under sheath 3.0cm. The relative permittivity of the insulating material is 2.5. The power factor on open circuit is 0.04. Determine: i) The capacitance of the cable. ii) Charging conductor. iii) Maximum dielectric stress. iv) Minimum dielectric stress.	CO4	7 Marks

UNIT-II

3	a)	Discuss the classification of overhead transmission lines. Define A, B, C and D constants of a transmission line.	CO3	7 Marks
	b)	Derive the reflection and refraction coefficients of a line terminated with resistance.	CO2	7 Marks
		(OR)		
4	a)	Define regulation of a short 3-phase transmission system and develop an expression for approximate voltage regulation.	CO1	7 Marks
	b)	A balanced 3-phase load of 30MW is supplied at 132kV, 50Hz and 0.85 p.f lagging by means of a transmission line. The series impedance of a single conductor is (20 + j52) ohms and the total phase-neutral admittance is 315×10^{-6} mho. Using nominal-T method, determine: i) The A, B, C and D constants of the line. ii) Sending end voltage. iii) Regulation of the line.	CO4	7 Marks

UNIT-III

5	a)	A transmission line has a span of 275m between level supports. The conductor has an effective diameter of 1·96 cm and weighs 0·865 kg/m. Its ultimate strength is 8060 kg. If the conductor has ice coating of radial thickness 1·27cm and is subjected to a wind pressure of 3·9 gm/ cm^2 of projected area, calculate sag for a safety factor of 2. Weight of 1 c.c. of ice is 0·91 gm.	CO4	7 Marks
	b)	A 3-phase, 220kV, 50Hz transmission line consists of 1·5 cm radius conductor spaced 2 metres apart in equilateral triangular formation. If the temperature is 40ºC and atmospheric pressure is 76cm, calculate the corona loss per km of the line. Take mo = 0·85.	CO3	7 Marks

(OR)

6	a)	Each line of a 3-phase system is suspended by a string of 3 identical insulators of self-capacitance C farad. The shunt capacitance of connecting metal work of each insulator is 0·2 C to earth and 0·1 C to line. Calculate the string efficiency of the system if a guard ring increases the capacitance to the line of metal work of the lowest insulator to 0·3 C	CO2	10 Marks
	b)	Explain briefly various line supports used for overhead transmission system.	CO1	4 Marks

UNIT-IV

7	a)	Explain load modeling and its characteristics.	CO1	7 Marks
	b)	A two-wire DC distributor cable 1000metres long is loaded with 0·5 A/metre. Resistance of each conductor is 0·05 Ω/km. Calculate the maximum voltage drop if the distributor is fed from both ends with equal voltages of 220 V. What is the minimum voltage and where it occurs?	CO4	7 Marks

(OR)

8	a)	Explain various factors that influence voltage levels in design and operation of the distribution system.	CO3	7 Marks
	b)	Discuss the difference between radial and loop types of primary distribution feeders.	CO5	7 Marks

UNIT-V

9	a)	How do you analyze a substation service area with ‘n’ primary feeders?	CO2	8 Marks
	b)	List the procedure to select the location of substation.	CO7	6 Marks

(OR)

10	a)	Give the comparison of outdoor and indoor sub-stations.	CO5	7 Marks
	b)	What are the advantages of GIS over conventional air substations? Give the limitations of GIS.	CO6	7 Marks

CODE No.: 16BT50301 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August - 2021

DESIGN OF MACHINE ELEMENTS-II
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		A journal bearing is proposed for a steam engine. The load on the journal is 2 kN, diameter 45mm, length 60mm, speed 1500 r.p.m., diametral clearance 0.001 mm, ambient temperature 15.5°C. Oil SAE 10 is used and the film temperature is 60°C. Determine the heat generated and heat dissipated. Take absolute viscosity of SAE10 at 60°C = 0.014 kg/m-s.	CO3	14 Marks
		(OR)		
2		A 70mm long journal bearing supports a load of 2700N on a 40mm diameter shaft. The bearing has a radial clearance of 0.05mm and the viscosity of the oil is 0.021 kg/m-s at the operating temperature. If the bearing is capable of dissipating 80J/s, determine the maximum safe speed.	CO2	14 Marks

UNIT-II

3		The ball bearings are to be selected for an application in which the radial load is 2000N during 90% of the time and 8000N during the remaining 10%. The shaft is to rotate at 150 r.p.m. Determine the minimum value of the basic dynamic load rating for 5000 hours of operation with not more than 10% failures.	CO4	14 Marks
		(OR)		
4		A ball bearing subjected to a radial load of 5 kN is expected to have a life of 8000 hours at 1450 r.p.m. with a reliability of 99%. Calculate the dynamic load capacity of the bearing so that it can be selected from the manufacturer's catalogue based on a reliability of 90%.	CO4	14 Marks

UNIT-III

5	a)	Explain briefly about Lewis equation for tangential tooth load (capacity) for both spur and helical gears.	CO1	7 Marks
	b)	Explain about double helical and herring bone gears with neat sketch.	CO1	7 Marks
		(OR)		
6		Design a pair of spur gears to transmit 25kW at 1200 r.p.m to a parallel shaft to be rotated at 600 r.p.m. The center distance between shafts is 175mm.	CO3	14 Marks

UNIT-IV

7	a)	Write the classification of springs	CO1	4 Marks
	b)	Design a helical compression spring to sustain an axial load of 3kN. The deflection is 60mm. spring index is '6'. The shear stress is not to exceed 300MPa. Rigidity modulus for spring material is 81GPa.	CO3	10 Marks
		(OR)		
8		Design a helical spring to support a tensile load of 6 kN and to have a stiffness of 100N/mm. the spring index is 6. The spring is made of steel having allowable stress of 300MPa. Take G=80GPa.	CO3	14 Marks

UNIT-V

9	An open-belt drive connects two pulleys 120cm and 50cm diameters, on parallel shafts 4m apart. The maximum tension in the belt is 1855.3 N. The co-efficient of friction is 0.3. The driver pulley of diameter 120cm runs at 200 r.p.m. Calculate: i) The power transmitted. ii) Torque on each of the two shafts.	CO6	14 Marks
	(OR)		
10	Design a cast iron piston for a single acting four stroke engine for the following data: Cylinder bore = 100 mm; Stroke = 125 mm; Maximum gas pressure = 5 N/mm^2; Indicated mean effective pressure = 0.75 N/mm^2; Mechanical efficiency = 80%; Fuel consumption = 0.15 kgper brake power per hour; Higher calorific value of fuel = 42 x 103 kJ/kg; Speed = 2000 r.p.m. Any other data required for the design may be assumed.	CO5	14 Marks

CODE No.: 16BT50302 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

INDUSTRIAL ENGINEERING AND MANAGEMENT
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Explain the contributions of F.W. Taylor's to management.	CO1	14 Marks
		(OR)		
2		What is SWOT analysis? Illustrate it with business example.	CO2	14 Marks

UNIT-II

3		Discuss in detail various factors affecting plant location.	CO2	14 Marks
		(OR)		
4	a)	Discuss bath tub curve in conjunction with reliability.	CO2	7 Marks
	b)	Discuss the following hazard models with neat sketches. i) Constant hazard model. ii) Linearly increasing model.	CO1	7 Marks

UNIT-III

5		Define Work study. List and explain the steps involved in method study.	CO1	14 Marks
		(OR)		
6		Explain in detail the work sampling procedure.	CO1	14 Marks

UNIT-IV

7		The demand for an item in a company is 18000 units per year, and the company can produce the item at a rate of 3000 per month. The cost of one setup is Rs.500 and the holding cost of one unit is Rs.0.15 per month. The cost of shortage is Rs 20 per year. Determine the optimum manufacturing quantity and the number of shortages. Also determine the manufacturing time and time between setups	CO3	14 Marks
		(OR)		
8		Find the optimal quantity for a product where the annual demand for a product is 500 units. The cost of storage per unit per year is 10% of the unit cost and the ordering cost per order is Rs.180. The unit costs are given below.	CO4	14 Marks

Quantity	Purchasing Cost
$0 \leq Q1 < 500$	Rs.25 per unit
$500 \leq Q2 < 1500$	Rs.24.80 per unit
$1500 \leq Q3 < 3000$	Rs.24.60 per unit
$3000 \leq Q4$	Rs. 24.40

UNIT-V

9		What is the significance of control chart in industry? List the basic steps involved for drawing variable control charts.	CO5	14 Marks
		(OR)		
10	a)	Define TQM. Illustrate with examples the significance of TQM in organizational growth.	CO1	7 Marks
	b)	Discuss the significance of duties of plant safety inspector in the industries.	CO6	7 Marks

CODE No.: 16BT50303 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC16) Supplementary Examinations August – 2021

METROLOGY AND MEASUREMENTS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Define error. Explain types of errors in measuring system. CO1 6 Marks

b) A slip gauge set with 87 pieces, as under is available. CO2 8 Marks

Range (mm)	Steps (mm)	No. of blocks
1.001 to 1.009	0.001	9
1.01 to 1.49	0.01	49
0.5 to 9.5	0.5	19
10 to 90	10	9
100	-	1

Build up the following dimensions with minimum number of slip gauges.
i) 29.578 mm. ii) 46.635 mm.

(OR)

2 a) With neat sketches, differentiate between hole basis system and shaft basis system. CO1 7 Marks

b) Determine the dimensions and tolerances of shaft and hole having size of $30H_7h_8$ fit. Also, determine the allowance and maximum clearance. CO3 7 Marks

UNIT-II

3 a) List various types of limit gauges and explain any three gauges. CO1 7 Marks

b) Describe mechanical comparator with a neat sketch and explain clearly the method of magnification adopted to it. CO5 7 Marks

(OR)

4 a) Why is sine bar not suitable for measuring angles above 45^0? CO2 6 Marks

b) Explicate the working principle of: CO1 8 Marks
i) Optical comparator.
ii) Pneumatic comparator.

UNIT-III

5 a) Illustrate with suitable sketches the measurement of straightness using autocollimator. CO1 8 Marks

b) Explain flatness measurement using straight edges. CO1 6 Marks

(OR)

6 a) Describe various methods of measuring surface texture giving their relative advantages. CO5 8 Marks

b) Mention various BIS symbols for indication of surface finish. CO1 6 Marks

UNIT-IV

7 Name the important elements of thread which are required to be measured in order to determine the accuracy of screw threads. Describe in brief how the errors in these elements affect the working of the threaded elements. CO1 14 Marks

(OR)

8 a) Demonstrate the method used for checking pitch of the gear. CO5 6 Marks

b) Describe a gear tooth vernier caliper and show how this is used for checking gears. CO4 8 Marks

UNIT-V

9	a)	Explain the following: i) Electrical strain gauge. ii) Stain gauge rosettes.	CO1	8 Marks
	b)	Differentiate between compressive strains and tensile strains.	CO1	6 Marks
		(OR)		
10	a)	Write short notes on Electrical resistance sensors and Junction semiconductor sensors.	CO1	7 Marks
	b)	Explain the method used for pressure measurement.	CO5	7 Marks

CODE No.: 16BT50304 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August - 2021

REFRIGERATION AND AIR CONDITIONING
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	The COP of an air refrigeration cycle is very low, but still a refrigeration system is most common in the Air craft, discuss the statement.	CO1	6 Marks
	b)	A Bell-Coleman refrigeration cycle works between 1 bar and 6 bar. The adiabatic efficiency of compression is 90% and expansion is 95%. Find the COP of the system and its tonnage when the air flow rate is 2 kg/sec. The ambient temperature is 25^0C and refrigerator temperature is -5^0C.	CO3	8 Marks
		(OR)		
2	a)	Derive an expression for the COP of Bell-Coleman cycle.	CO1	6 Marks
	b)	The capacity of a refrigerator is 200 TR when working between - 8^0 C and 26^0 C. Determine the mass of ice produced per day from water at 26^0C. Also find the power required to drive the unit. Assume that the cycle operates on reversed carnot cycle and latent heat of ice is 335 kJ/kg	CO2	8 Marks

UNIT-II

3	a)	How does the increase in condenser temperature affect COP? Also explain the influence of evaporator temperature on COP. Which of the two temperatures have more influence on COP?	CO1	6 Marks
	b)	A vapour compression machine is used to maintain a temperature of -23^0 C in a refrigerated space. The ambient temperature is 37^0 C. The compressor takes in dry saturated vapour of F-12. A minimum 10^0C temperature difference is required at the evaporator as well as at condenser. There is no sub cooling of the liquid. If the refrigerant flow rate is 1 kg/min, find: i) Tonnage of refrigeration. ii) Power requirement. iii) Ratio of COP of this cycle to COP of carnot cycle.	CO4	8 Marks
		(OR)		
4	a)	What are essential properties of a good refrigerant?	CO1	4 Marks
	b)	A four cylinder, single acting R-12 compressor 30cm x 40cm runs at 960 r.p.m. The compressor clearance factor is 0.03 and the law of compression $PV^{1.1}$=C. the operating pressures for the vapour compression refrigeration system are: 8.47 bar (35^0C) and 1.004 bar (-30^0C). The refrigerant temperatures are: entering the compressor -20^0C, leaving the compressor 50^0C; entering the condenser 45^0C, leaving the condenser 25^0C, entering the expansion valve 30^0C and leaving the evaporator dry saturated. Assuming that heat removed in the compressor is 25 kJ/sec. calculate: i) The refrigerating capacity. ii) The compressor power. iii) C.O.P. iv) Mass of condensing cooling water assuming the rise in temperature to be 10^0C. v) Also tabulate energy balance for 1 kg of refrigerant.	CO4	10 Marks

UNIT-III

5	a)	Discuss the advantages of vapour absorption refrigeration system over vapour compression refrigeration system.	CO1	7 Marks
	b)	In a vapour absorption refrigeration system, heating, cooling and refrigeration takes place at the temperatures of 100^0C, 20^0C and -5^0C respectively. Find the maximum C.O.P of the system.	CO3	7 Marks

(OR)

6	a)	What is thermo electric refrigeration system? List out the merits and demerits of thermo-electric refrigeration system over other refrigeration system. What are the fields of its applications?	CO2	6 Marks
	b)	Determine the COP of a vapour absorption refrigeration system when the temperature of generator is 120^0C, the temperature of the condenser is 30^0C and the temperature of the evaporator is -20^0C. What would be its C.O.P, if it were a Carnot?	CO2	8 Marks

UNIT-IV

7		The following data apply to an air conditioning system: Room sensible heat =41868kJ/hr ; room latent heat=41868 kJ/hr; inside design condition= 25^0C, 50% RH, outside design condition=35^0C, DBT, 27.8 WBT. Return air from the room is mixed with the outside air before entering the cooling coil in the ratio of 4:1. Return air from the room is mixed with the cooling air, i.e. after the cooling coil in the ratio of 1:4. Cooling coil by pass factor is 0.1. The air may be reheated if necessary before supplying to the conditioned space. Assume ADP as 10^0C and determine, i) Supply air conditions into the room. ii) Refrigeration load due to the reheat. iii) Total refrigeration capacity. iv) The quantity of fresh air supplied.	CO5	14 Marks

(OR)

8	a)	Explain in brief, an adiabatic saturation process. Represent the same on a psychrometric chart.	CO5	6 Marks
	b)	Ten grams of moisture per kg of dry air is removed from atmospheric air when it is passed through an air conditioning system and its temperature becomes 20^0C. The atmospheric conditions are 40^0C DBT and 60% RH. Find the following for the conditioned air. i) Relative humidity. ii) Wet-bulb temperature. iii) Dew point temperature. iv) Enthalpy change for the air. Assume standard atmospheric pressure.	CO6	8 Marks

UNIT-V

9	a)	Explain in detail, the filters used in air conditioning systems.	CO1	7 Marks
	b)	Explain the use of heat pump for heating and cooling cycle with a neat diagram.	CO1	7 Marks

(OR)

10	a)	Define human comfort and explain the factors which affect human comfort.	CO1	7 Marks
	b)	Discuss various types of duct systems and their applications.	CO1	7 Marks

CODE No.: 16BT50305 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August - 2021

THERMAL ENGINEERING-II
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Differentiate between water tube and fire tube boilers.	CO1	7 Marks
	b)	Discuss the working of Babcock and Wilcox boiler with a neat sketch.	CO1	7 Marks
		(OR)		
2	a)	Describe Locomotive boiler with a neat sketch.	CO1	7 Marks
	b)	In a Rankine cycle the steam at inlet to the turbine is saturated at a pressure of 20 bar and exhaust pressure is 0.04 bar. Determine: i) Pump work. ii) Turbine Power. iii) Rankine efficiency. Assume the flow rate of steam as 10 kg/sec.	CO2	7 Marks

UNIT-II

3	a)	Write a short note on equivalent evaporation, factor of evaporation and boiler efficiency.	CO1	7 Marks
	b)	A Lancashire boiler generates 2500 kg of dry steam / hr at a pressure of 11 bar. The grate area is 3.6 m^2 and 75 kg of coal is burnt / m^2 of grate area /hr. The calorific value of the coal is 33,200 kJ/kg and temperature of feed water is 17.5^{0}C. Determine: i) Actual evaporation / kg of coal. ii) Equivalent evaporation from and at 100^{0}C. iii) Efficiency of the boiler.	CO3	7 Marks
		(OR)		
4	a)	Explain induced draught and forced draught.	CO1	7 Marks
	b)	How much air used per kg of coal burnt in a boiler having chimney of 32.3m height to create a draught of 19mm of water column when the temperature of flue gases in the chimney is 370^{0}C and the temperature of boiler house is 30^{0}C?	CO4	7 Marks

UNIT-III

5	a)	Explain the types of steam nozzles.	CO1	5 Marks
	b)	Dry saturated steam at a pressure of 5 bar enters in a nozzle and is discharged at a pressure of 1.5 bar. Find the final velocity of steam, when the initial velocity of the steam is neglected. If 10% of heat drop is lost in friction, find the % reduction In the final velocity.	CO2	9 Marks
		(OR)		
6	a)	Give the classification of steam turbines.	CO1	5 Marks
	b)	The velocity of steam leaving the nozzles of impulse turbine is 1200 m/s and the nozzle angle is 20°. The blade velocity is 375 m/s and the blade velocity coefficient is 0.75. Assuming no loss due to shock at inlet, calculate for a mass flow of 0.5 kg/s and symmetrical blading. i) Blade inlet angle. ii) Driving force on the wheel. iii) Axial thrust on the wheel. iv) Power developed by Turbine.	CO5	9 Marks

UNIT-IV

7	a)	What are various sources of air leakage in to steam condenser? How does it affect the performance of condensing plant?	CO2	7 Marks
	b)	Describe with neat sketch the working of surface condenser.	CO1	7 Marks

(OR)

8	a)	What is 50% Reaction Turbine? What are the characteristics of 50% Reaction Turbine?	CO1	5 Marks
	b)	Reaction Turbine runs at 3000 r.p.m and its steam consumption is 15400kg/hr. the pressure of steam at a certain pair is 1.9 bar its dryness 0.93 and power developed by air is 3.5 kW. The discharging blade tip angle is 200 for both fixed and moving blades and the axial velocity of flow is 0.72 of the blade velocity. Find the drum diameter and blade height. Take the tip leakage steam as 8%, but neglect blade thickness.	CO2	9 Marks

UNIT-V

9	a)	Distinguish between rocket propulsion and turbojet propulsion Engines.	CO1	7 Marks
	b)	The air enters the compressor of an open cycle constant pressure gas turbine at a pressure of 1 bar and temperature of 20^0C. The pressure of air after compression is 4bar. The isentropic efficiency of compressor and turbine are 80% and 85% respectively. The air fuel ratio used is 90:1. If flow rate of air is 3 kg/s, find i) power developed ii) thermal efficiency of the cycle . Assume C_P=1 kJ/kgK, γ =1.41 and Calorific Value fuel = 41800kJ/Kg.	CO2	7 Marks

(OR)

10	a)	In a constant pressure open cycle gas turbine air enters at 1 bar and 20^0C and leaves the compressor at 5 bar. Using the following data: temperature of the gases entering the turbine = 680^0C, pressure loss in the combustion chamber = 0.1 bar, $\eta_{compressor}$ = 85%, $\eta_{turbine}$ = 80%, $\eta_{combustion}$ = 85%, γ =1.4, C_p=1.024kJ/kg K for air and gas. Find: i) The quality of air circulation if the plant develops 1065kW. ii) Heat supplied per kg of circulation. iii) Thermal efficiency of the cycle. Mass of fuel may be neglected.	CO2	7 Marks
	b)	Explain the effect of regeneration, inter cooling, and reheating on the performance of Gas turbine plant.	CO2	7 Marks

CODE No.: 16BT50308 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August - 2021

MECHATRONICS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Define the term feedback and explain the differences between open and closed loop control systems.	CO1	14 Marks
		(OR)		
2	a)	Define Mechatronics. Mention the key elements of Mechatronic systems.	CO1	6 Marks
	b)	Mention the advantages and disadvantages involved in a mechatronic systems.	CO1	8 Marks

UNIT-II

3	a)	Explain the static characteristics of a sensor. A potentiometer which is used to measure the rotational position of a shaft has 850 turns of wire. The input range is from -160° to +160°. The output range is from 0 V to 12 V. Determine the span, sensitivity and average resolution.	CO1	6 Marks
	b)	Explain the working principle and operation of an optical encoder.	CO2	8 Marks
		(OR)		
4	a)	State the factors to be considered for selecting a sensor.	CO2	4 Marks
	b)	What is a pneumatic system? Explain the elements of a pneumatic system.	CO2	10 Marks

UNIT-III

5	a)	What is noise in signals? Explain low pass and band pass filtering circuit.	CO3	8 Marks
	b)	Explain voltage frequency converters with their use in signal conditioning.	CO1	6 Marks
		(OR)		
6	a)	Why is operation amplifiers used in signal conditioning? Explain differential amplifier with neat sketch.	CO3	8 Marks
	b)	Derive an expression for finding the unknown resistance in Wheat stone bridge circuit.	CO3	6 Marks

UNIT-IV

7		Describe and compare the characteristics of Proportional (P) control and Proportional plus integrated (PI) control.	CO4	14 Marks
		(OR)		
8	a)	Explain PID controller tuning using process reaction curve method.	CO4	8 Marks
	b)	A PI controller has an input voltage range of 0.4 – 2 V and the output voltage range 0.10 V, R_2= 160 kΩ, R_1=8 kΩ and C= 10 μF. Determine the values of gain K_p, K_i and proportional band of integration gain in %/(%s).	CO4	6 Marks

UNIT-V

9	a)	Explain the mechatronics design approach.	CO5	8 Marks
	b)	Elaborate the method of automatic car parking system.	CO5	6 Marks
		(OR)		
10	a)	Describe the mechatronics application in an automobile engine management system.	CO5	10 Marks
	b)	Justify the importance of ethics as a design constraint.	CO6	4 Marks

CODE No.: 16BT50401 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August - 2021

DIGITAL COMMUNICATIONS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Sketch the electrical representation of binary data 01101001 using different formats.	CO1	4 Marks
	b)	Compare Delta Modulation (DM) and Pulse Code Modulation (PCM) Systems.	CO2	10 Marks
		(OR)		
2	a)	What is Companding and explain different types of Companding techniques?	CO1	9 Marks
	b)	Examine the need for non uniform quantization in PCM System.	CO2	5 Marks
		UNIT-II		
3	a)	Derive an expression for Quantization noise in a PCM System.	CO2	7 Marks
	b)	Compare the performance of PCM coded transmission systems using BPSK and FSK modulation.	CO2	7 Marks
		(OR)		
4		Justify that the Output SNR in a PCM system is superior to that of a DM System.	CO3	14 Marks
		UNIT-III		
5	a)	Compare different types of digital modulation schemes.	CO2	6 Marks
	b)	Implement a Digital system for generation and reception of BFSK.	CO6	8 Marks
		(OR)		
6	a)	Implement an Optimum filter and derive the Probability of error of an Optimum Filter.	CO6	10 Marks
	b)	Identify the advantages of Differential Phase Shift Keying (DPSK) over Phase Shift Keying (PSK).	CO2	4 Marks
		UNIT-IV		
7	a)	A discrete message source is generating the message sequence [X] = [A, B, C, D, E, F, G, H] with probabilities [P]=[0.50, 0.15, 0.15, 0.08, 0.08, 0.02, 0.01, 0.01]. Find the Codewords using Huffman coding.	CO5	10 Marks
	b)	Define the following terms. i) Channel Capacity. ii) Rate of information.	CO1	2+2 Marks
		(OR)		
8	a)	A discrete memory less source emits messages from the set of size M=4 at the rate of r = 2000 symbols/sec. The symbol probabilities are 1/2, 1/4, 1/8, 1/8. Estimate i) the information contained in each message. ii) average information per symbol. iii) information rate.	CO5	8 Marks
	b)	i) Differentiate the terms Data and Information ii) Define entropy.	CO1	3+3 Marks

UNIT-V

9	a)	Assess error detection and error correction capabilities of linear block codes.	CO4	6 Marks
	b)	Design an encoder for generating (7,4) systematic cyclic code generated by $\mathbf{g(x)=1+x+X^3}$.	CO3	8 Marks

(OR)

10	a)	The generator matrix for a (6, 3) block code is given below. Construct all code vectors of this code. $G = \begin{matrix} 1 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 0 & 1 \end{matrix}$.	CO3	6 Marks
	b)	State and explain with examples about the Convolution Coding.	CO4	8 Marks

CODE No.: 16BT50402 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August - 2021

MICROPROCESSORS AND MICROCONTROLLERS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Illustrate role of Assembler Directives in ALP using a model program.	CO2	7 Marks
	b)	Contrast Procedures to MACROs with suitable examples.	CO2	7 Marks
		(OR)		
2	a)	Illustrate Intel 8086 memory organization as even and odd banks and point out how both byte and word access were supported.	CO5	7 Marks
	b)	Interpret the following Assembler directives. i) ENDS. ii) EVEN. iii) DUP. iv) Assume.	CO2	7 Marks

UNIT-II

3	a)	Describe Intel 8086 Pin Diagram.	CO1	7 Marks
	b)	Write 8086 assembly language program to SORT an array of 10 bytes in descending order.	CO4	7 Marks
		(OR)		
4	a)	Design the Timing Diagram of Read and write cycle in maximum mode configuration.	CO3	8 Marks
	b)	Distinguish NMI and INTR.	CO2	6 Marks

UNIT-III

5	a)	Interpret about control words of 8255. i) Mode Set Control Word. ii) BSR Mode.	CO1	7 Marks
	b)	Differentiate between automatic rotation and automatic EOI mode.	CO2	7 Marks
		(OR)		
6	a)	Draw and explain ICW and OCW formats.	CO1	10 Marks
	b)	Compare pole command mode and EOI mode.	CO2	4 Marks

UNIT-IV

7	a)	Design a flowchart and develop an ALP to perform arithmetic operations on two unsigned bytes from: i) Internal RAM. ii) External RAM.	CO3	7 Marks
	b)	Write an ALP to store 10 bytes of data stored in RAM locations starting from 45H to transfer serially. At the end of data transfer the value of R0 is displayed on Port 1.	CO4	7 Marks
		(OR)		
8	a)	Compose a program for bit manipulation operations in 8051.	CO4	7 Marks
	b)	Design a flowchart and write an ALP to transfer a block of 8 bytes from External RAM at 4500H to External RAM at 5400H.	CO3	7 Marks

UNIT-V

9	a)	Show the setup and develop an ALP to interface keyboard with 8051 microcontroller.	CO5	7 Marks
	b)	Model the setup and develop an ALP to interface LCD with 8051 microcontroller. Specify the applications of it.	CO6	7 Marks

(OR)

10	a)	Show the setup to interface seven segment displays with 8051 and write a program for generating a sequence in seven segments depending on your own assumption.	CO5	7 Marks
	b)	Apply 8051 interfacing concept to interface 4 digits of 7 segment LED display to Intel 8051. Mention the applications of it.	CO6	7 Marks

CODE No.: 16BT50403 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August - 2021

VLSI DESIGN

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Why CMOS inverter is called a low power device? Explain.	CO3	6 Marks
	b)	Assess the Metallization and Encapsulation methods related to IC fabrication process.	CO2	8 Marks
		(OR)		
2	a)	Derive an equation for Transconductance of an n channel enhancement MOS- FET operating in active region.	CO2	6 Marks
	b)	A PMOS transistor is operated in triode region with the following parameters. VGS = -4.5V, Vtp = -1V, VDS = -2.2V, (W/L) = 95, μnCox = 95μA/V 2. Find its drain current and drain source resistance.	CO3	8 Marks

UNIT-II

3	a)	Sketch the stick diagram for NAND gate and give its procedural steps.	CO4	8 Marks
	b)	Discuss the limitations of scaling of MOS circuits.	CO1	6 Marks
		(OR)		
4	a)	Design a layout diagram for N-MOS inverter.	CO4	7 Marks
	b)	Illustrate the lambda-based design rules.	CO1	7 Marks

UNIT-III

5	a)	Explain the construction of transmission gate based adder in detail.	CO1	7 Marks
	b)	Assess the operation of Manchester carry chain adder and find the worst case delay of carry chain.	CO4	7 Marks
		(OR)		
6	a)	Outline the features of 4-by-4 barrel shifter using complementary transmission gates. Sketch its circuit diagram and explain its shifting operation.	CO4	8 Marks
	b)	Write short note on: i) Carry skip adder. ii) Carry select adder.	CO1	6 Marks

UNIT-IV

7	a)	Outline the different programmable blocks used in the general architecture of FPGA.	CO6	7 Marks
	b)	Differentiate the channeled gate array and channel less gate array.	CO2	7 Marks
		(OR)		
8	a)	Differentiate the array-based programmable wiring and switch box based programmable wiring.	CO2	7 Marks
	b)	Sketch and explain the typical standard-cell structure showing low-power cell.	CO6	7 Marks

UNIT-V

9	a)	Mention how many test vectors are required to exhaustively test a combinational circuit with n-inputs and a sequential circuit with n-inputs and m-storage devices respectively.	CO5	7 Marks
	b)	Write short notes on Design strategies for test.	CO1	7 Marks
		(OR)		
10	a)	Write short notes on CMOS testing.	CO1	7 Marks
	b)	Examine Power minimization techniques in design and sleep mode.	CO5	7 Marks

CODE No.: 16BT50442 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August - 2021

MICROPROCESSORS AND INTERFACING
[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Explain the initialization sequence of 8259A.	CO3	7 Marks
	b)	Write about the command words of 8259A.	CO2	7 Marks
		(OR)		
2	a)	Explain about Internal architecture of 8279 Keyboard/Display interface.	CO2	10 Marks
	b)	What is the purpose of priority resolver in 8259A?	CO2	4 Marks
		UNIT-II		
3	a)	What is the importance of cascade buffer/comparator? Explain briefly.	CO2	7 Marks
	b)	Draw and Explain ICW and OCW?	CO2	7 Marks
		(OR)		
4	a)	What is pole command mode and EOI mode?	CO2	7 Marks
	b)	Differentiate cascade mode and buffered mode.	CO1	7 Marks
		UNIT-III		
5	a)	Draw and explain the internal architecture of 8259.	CO1	10 Marks
	b)	Explain importance of ISR and IRR?	CO2	4 Marks
		(OR)		
6	a)	Discuss in detail DMA.	CO3	7 Marks
	b)	What is 8251? How can it be programmed to operate in serial communication mode?	CO5	7 Marks
		UNIT-IV		
7	a)	Show the setup to and write an ALP to interface a hexadecimal key pad to Intel 8086. Specify the applications of it.	CO6	7 Marks
	b)	Briefly describe the importance of modem control in 8251.	CO2	7 Marks
		(OR)		
8	a)	Draw the Pinouts of 8251A and discuss them in detail.	CO2	10 Marks
	b)	What is the function of mode set register available in 8257?	CO1	4 Marks
		UNIT-V		
9	a)	Draw and explain the internal architecture of 8257.	CO1	10 Marks
	b)	Draw the formats of ICW3 in master and slave mode.	CO1	4 Marks
		(OR)		
10	a)	Draw and explain mode instruction control word format in Asynchronous and synchronous mode.	CO3	10 Marks
	b)	Explain briefly automatic rotation and automatic EOI mode.	CO1	4 Marks

CODE No.: 16BT50501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

COMPUTER NETWORKS

[Electronics and Communication Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Write short notes on the following guided and unguided transmission medium. i) Twisted-Pairs. ii) Coaxial Cable. iii) Fiber Optics. iv) Radio Transmission.	CO1	14 Marks
		(OR)		
2	a)	Sketch the electromagnetic spectrum for Wireless Transmission.	CO1	7 Marks
	b)	Distinguish between Radio Wave Transmission and Microwave Transmission.	CO2	7 Marks

UNIT-II

3	a)	Sketch the Ethernet frame format.	CO1	7 Marks
	b)	List and explain the fields of Ethernet frame.	CO1	7 Marks
		(OR)		
4	a)	Write the properties of Data Link - Layer Switching. Compare Switch and Router.	CO2	7 Marks
	b)	Illustrate Collision-Free Protocols with examples.	CO1	7 Marks

UNIT-III

5		Illustrate the following congestion control algorithms with an example: i) Leaky bucket Algorithm. ii) Random Early Detection.	CO2	14 Marks
		(OR)		
6	a)	Distinguish between ARP and RARP Protocols.	CO2	7 Marks
	b)	Explain Various Internet Control Message Protocol Message Types.	CO1	7 Marks

UNIT-IV

7		A TCP connection is established over a 1.2 Gb/s link with a round-trip time of 3.3ms. To transmit a file of size 2 MB, we start sending it, using 1 KB packets. i) How long does the transmission take if an Additive Increase, Multiplicative Decrease Control with a window size of w_g = 500 KB is used? ii) Repeat part (i), using Slow-Start Control.	CO4	14 Marks
		(OR)		
8	a)	Draw the TCP segment header format and explain the use of each field in detail	CO1	7 Marks
	b)	Summarize congestion control mechanisms in TCP.	CO2	7 Marks

UNIT-V

9	a)	List and explain the built-in HTTP request methods.	CO1	7 Marks
	b)	How is Hypertext Transfer Protocol related to World Wide Web?	CO2	7 Marks
		(OR)		
10	a)	Explain in detail about messages headers in Hypertext Transfer Protocol.	CO1	7 Marks
	b)	Illustrate Hypertext Transfer Protocol caching.	CO2	7 Marks

CODE No.: 16BT50502 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC16) Supplementary Examinations August – 2021

LINUX PROGRAMMING
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Explain in detail about gethostname and uname function.	CO1	7 Marks
	b)	Write a linux program which extracts some user information from password database.	CO3	7 Marks
		(OR)		
2	a)	Design a linux program which extracts host information using getuid function	CO4	10 Marks
	b)	Compare internal and external commands.	CO2	4 Marks
		UNIT-II		
3	a)	Define shell and its responsibilities.	CO1	4 Marks
	b)	Write shell script on prime number and Fibonacci series by using control structures.	CO3	10 Marks
		(OR)		
4	a)	Write a shell script that takes a login name and reports when that person logs in.	CO3	7 Marks
	b)	Write a shell script that receives any number of file names as arguments checks if every argument supplied is a file or a directory and reports accordingly. Whenever the argument is a file, the number of lines on it is also reported.	CO6	7 Marks
		UNIT-III		
5	a)	Analyze the working of formatted Input and Output.	CO2	7 Marks
	b)	Illustrate briefly with example file and directory maintenance.	CO5	7 Marks
		(OR)		
6	a)	Define a file descriptor and explain it briefly with a simple program.	CO1	6 Marks
	b)	What is file permission? What are different ways of setting file permission? Explain.	CO1	8 Marks
		UNIT-IV		
7	a)	Analyze the need for zombie process with example.	CO2	6 Marks
	b)	Write a filter program that reads from its standard input and writes to its standard output converting into uppercase by using shell redirection.	CO4	8 Marks
		(OR)		
8	a)	Write a program that illustrates the working of signal.	CO4	7 Marks
	b)	Discuss the following commands with example: i) kill. ii) killall.	CO1	7 Marks
		UNIT-V		
9	a)	Illustrate how unrelated process can communicate using named pipes.	CO5	7 Marks
	b)	Explain O-RDONLY and O-WRONLY command.	CO1	7 Marks
		(OR)		
10	a)	Discuss the Client/Server application creation using FIFO.	CO1	10 Marks
	b)	Illustrate the sequence after a call to pipe and fork.	CO1	4 Marks

CODE No.: 16BT50503 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August - 2021

COMPUTER VISION
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Give a brief overview of the anatomical structure of the Eye.	CO2	9 Marks
	b)	Give a brief explanation about Surface reflection.	CO2	5 Marks
		(OR)		
2	a)	Why do artificial light sources tend to produce colored light?	CO2	8 Marks
	b)	Explain about Color of surfaces.	CO1	6 Marks
		UNIT-II		
3	a)	Write about Image De-noising in detail.	CO3	10 Marks
	b)	Develop an algorithm for Texture representation using Vector quantization.	CO4	4 Marks
		(OR)		
4	a)	Develop Essential matrix and Fundamental matrix for Binocular camera geometry and the epipolar constraint.	CO4	7 Marks
	b)	Show that a circle appears as an ellipse in an orthographic view, that the minor axis of this ellipse is the tilt direction, and that the aspect ratio is the cosine of the slant angle.	CO1	7 Marks
		UNIT-III		
5	a)	Discuss about Human vision: Grouping and Gestalt with examples.	CO2	10 Marks
	b)	List out the important applications of Segmentation by Clustering.	CO1	4 Marks
		(OR)		
6	a)	Illustrate Agglomerative clustering with a graph and Develop an algorithm.	CO4	7 Marks
	b)	Explain Divisive clustering with a graph and Develop an algorithm.	CO1, CO4	7 Marks
		UNIT-IV		
7	a)	Explain Receiver Operating Curves (ROC) in detail.	CO2	10 Marks
	b)	Define the following. i) Error-rate. ii) Cross-validation.	CO1	4 Marks
		(OR)		
8	a)	Explain Detecting humans using Sliding window method.	CO1	7 Marks
	b)	Explain Detecting boundaries using Sliding window method.	CO1	7 Marks
		UNIT-V		
9	a)	Explain in detail about how to improve Current Image Features.	CO1	8 Marks
	b)	Describe the kinds of Image features.	CO1	6 Marks
		(OR)		
10	a)	Explain approximate Nearest neighbors by local sensitive hashing.	CO1	8 Marks
	b)	Describe about Ranking documents.	CO1	6 Marks

CODE No.: 16BT51001 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August - 2021

BIOMEDICAL INSTRUMENTATION
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Sketch the structure of living cell and explain its components.	CO1	7 Marks
	b)	List the problems encountered in measuring a living system.	CO4	7 Marks
		(OR)		
2		Identify the suitable electrode for measurement of cardiac signals and explain each in detail.	CO5	14 Marks

UNIT-II

3		Discuss different lead configurations used in ECG with relevant sketches.	CO2	14 Marks
		(OR)		
4		Describe the various methods available for measurement of Blood Pressure and explain any one.	CO2	14 Marks

UNIT-III

5	a)	Explain the standard norms of electrode configuration for measurement of EEG with neat diagram.	CO6	7 Marks
	b)	Describe the analysis of brain waves.	CO3	7 Marks
		(OR)		
6		Explain the principle, working of spirometer with suitable schematic diagram.	CO1	14 Marks

UNIT-IV

7		Illustrate circuit diagram of fixed rate pace makers and explain its working.	CO1	14 Marks
		(OR)		
8		Define diathermy and also explain microwave diathermy with a neat sketch.	CO1	14 Marks

UNIT-V

9		Distinguish ultrasonic imaging systems (A, B and M mode) with suitable diagrams.	CO5	14 Marks
		(OR)		
10		Identify the suitable instrument to analyze EGG and also explain principle and working of required instrument with neat sketch.	CO5	14 Marks

CODE No.: 16BT51003 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

PRINCIPLES OF COMMUNICATIONS

[Electrical and Electronics Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Draw the block diagram of communication system and explain each block.	CO1	7 Marks
	b)	Determine the percentage saving when the carrier wave and one of the sidebands are suppressed in an AM wave modulated to a depth of: i) 100% and ii) 50%.	CO2	7 Marks
		(OR)		
2	a)	Discuss about SSB-SC signal generation using phase shift method with suitable diagrams.	CO5	8 Marks
	b)	Differentiate: i) Line communication and radio communication. ii) Analog and digital signals.	CO2	6 Marks

UNIT-II

3	a)	Derive the mathematical expression for FM wave and its modulation index.	CO1	7 Marks
	b)	Derive the expression for narrow band FM.	CO1	7 Marks
		(OR)		
4		Define frequency modulation. Derive the expression for single tone FM wave and specify the bandwidth requirements.	CO4	14 Marks

UNIT-III

5		With a neat block diagram, explain a Digital Communication system and its advantages.	CO1	14 Marks
		(OR)		
6	a)	Draw and explain PAM modulator.	CO2	7 Marks
	b)	Explain the PAM signal recovery through holding circuit method.	CO5	7 Marks

UNIT-IV

7	a)	With suitable block diagram, explain the principle of operation of a PCM system	CO1	8 Marks
	b)	Explain different types of digital modulation techniques.	CO3	6 Marks
		(OR)		
8	a)	Explain the need for quantization and its effects in digital transmission.	CO5	8 Marks
	b)	Briefly explain ASK, FSK and PSK with relevant waveforms.	CO1	6 Marks

UNIT-V

9	a)	Define information, entropy and rate of information.	CO1	6 Marks
	b)	A discrete source emits one of five symbols once every milli seconds with probabilities 1/2, 1/4, 1/8, 1/16 and 1/16 respectively. Determine and information rate.	CO4	8 Marks
		(OR)		
10	a)	What is the importance of error detection and correction codes for error control?	CO6	4 Marks
	b)	State and explain convolutional codes with suitable examples.	CO1	10 Marks

CODE No.: 16BT51004 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August - 2021

COMPUTER ORGANIZATION AND ARCHITECTURE
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	With an example, show how user program and OS routine share the processor time effectively.	CO2	7 Marks
	b)	List the different types of buses present in a computer. Sketch the interconnections of the functional units of a computer to a single bus structure.	CO1	7 Marks
		(OR)		
2	a)	Select suitable algorithm for adding and subtracting numbers in signed 2's complement representation.	CO5	7 Marks
	b)	Pipelining increases speed of execution. Justify.	CO6	7 Marks

UNIT-II

3	a)	Design a 4 bit combinational circuit shifter.	CO3	7 Marks
	b)	Draw the flow chart to decode an instruction cycle.	CO5	7 Marks
		(OR)		
4	a)	Show how computer registers are connected to a common bus using multiplexers.	CO5	7 Marks
	b)	List and briefly explain the registers of a basic computer.	CO1	7 Marks

UNIT-III

5	a)	Describe the control and status signals of8085.	CO1	7 Marks
	b)	Discuss about the logical instructions of 8085 and their real time applications.	CO3	7 Marks
		(OR)		
6	a)	Draw the pin diagram of 8085 and justify the need to multiplex address and data pins.	CO1	7 Marks
	b)	Differentiate between JMP and CALL instructions.	CO2	7 Marks

UNIT-IV

7	a)	Draw and explain the 8085 interrupts and vector locations.	CO1	7 Marks
	b)	Interface two 2KB of EPROM to the 8085 processor by selecting suitable addresses.	CO4	7 Marks
		(OR)		
8	a)	Explain the addressing modes of 8085 with example.	CO1	7 Marks
	b)	Explain how a RAM chip (1K x 8) can be interfaced to 8085 microprocessor with the help of a diagram.	CO2	7 Marks

UNIT-V

9	a)	Design the organization of a 1K x 1 Memory with a neat sketch.	CO3	7 Marks
	b)	Analyze the working of static RAM cell.	CO2	7 Marks
		(OR)		
10	a)	Cache memory increases the speed of operation. Justify.	CO6	7 Marks
	b)	Discuss Out-of-order execution of a program.	CO1	7 Marks

CODE No.: 16BT51041 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August - 2021

SENSORS AND SIGNAL CONDITIONING
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Explain the loading effect on the accuracy of a resistance potentiometer transducer when used for measurement of displacement.	CO1	7 Marks
	b)	Apply the conceptual knowledge for the measurement of Relative humidity present in surrounding environment.	CO6	7 Marks
		(OR)		
2		Explain with the aid of a circuit diagram the principle of operation of a strain measurement system with temperature compensation technique.	CO5	14 Marks
		UNIT-II		
3		How angular displacement is measured using capacitive transducer?	CO1	14 Marks
		(OR)		
4		How is the rotational displacement measured by using capacitive transducer?	CO1	14 Marks
		UNIT-III		
5	a)	Compare a total radiation pyrometer with an optical pyrometer in terms of operation and construction details.	CO1	7 Marks
	b)	Provide a feasible solution for the conversion of mechanical energy into electrical energy.	CO4	7 Marks
		(OR)		
6		Explain the principle of working and construction details of a photo-voltaic cell. Explain why it is very useful for space applications.	CO1	14 Marks
		UNIT-IV		
7		Define digital sensor and explain the operation of position encoder with neat sketch.	CO1	14 Marks
		(OR)		
8		Analyze in detail the fiber –optic sensors and explain its applications.	CO2	14 Marks
		UNIT-V		
9		Sketch the block diagram of signal conditioning circuit and explain each block in detail	CO3	14 Marks
		(OR)		
10		Choose an appropriate technique to measure Reactance and also explain the operation in detail.	CO5	14 Marks

CODE No.: 16BT51202 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August - 2021

OBJECT ORIENTED ANALYSIS AND DESIGN
[Computer Science and Engineering, Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Write the importance of modeling.	CO1	4 Marks
	b)	List and explain principles of modeling.	CO1	10 Marks
		(OR)		
2	a)	Categorize the basic building blocks of UML with examples.	CO1	7 Marks
	b)	Describe structural and behavioral diagrams of UML in detail.	CO1	7 Marks

UNIT-II

3	a)	Distinguish class diagram and object diagram.	CO2	7 Marks
	b)	Analyze and explain how to control the visibility of elements present in package.	CO2	7 Marks
		(OR)		
4	a)	Categorize the owned elements in packages.	CO1	7 Marks
	b)	Compare and contrast various adornments in dependency relationship.	CO2	7 Marks

UNIT-III

5	a)	Design and apply modeling techniques of use case diagram for ATM application.	CO3	7 Marks
	b)	Design a model for home automation system with class diagram.	CO3	7 Marks
		(OR)		
6	a)	Design and apply modeling techniques of sequence diagram for School monitoring system.	CO3	7 Marks
	b)	Design a model for communication setup in mobile with sequence diagram.	CO3	7 Marks

UNIT-IV

7		Discuss in detail about State machines along with simple state, nested states, concurrent states, different events and action within each state for Point of Sale system.	CO4	14 Marks
		(OR)		
8		Describe the communication problems between thread states and thread lifecycle in state chart diagram.	CO4	14 Marks

UNIT-V

9	a)	Design a model for online shopping through component diagram.	CO5	7 Marks
	b)	Design a model for client server communication through deployment diagram.	CO5	7 Marks
		(OR)		
10	a)	Design and apply modeling techniques of component diagram for home automation system.	CO5	7 Marks
	b)	Design and apply modeling techniques of deployment diagram for library information system.	CO5	7 Marks

CODE No.: 16BT51203 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August - 2021

WEB TECHNOLOGIES
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Name different types of lists supported by HTML. Distinguish between HTML and HTML5.	CO1, CO2	7 Marks
	b)	Explain the following HTML tags with suitable example. i) <pre>. ii) <canvas>. iii) <img>. iv) .	CO1	7 Marks
		(OR)		
2	a)	Explain the frames and table tags of HTML with suitable example.	CO1	7 Marks
	b)	Explain the following HTML tags with suitable example. i) <font>. ii) <meta>. iii) <p>. iv) <video>.	CO1	7 Marks
		UNIT-II		
3	a)	Classify CSS selectors and explain.	CO2	7 Marks
	b)	Design a web page that display credit card type and then validate the entered card number according to the card type.	CO6	7 Marks
		(OR)		
4	a)	Explain the following pre-defined objects of JavaScript. i) Window. ii) Document.	CO1	7 Marks
	b)	Develop a web page to convert Indian rupees to Foreign currency. Read the Indian rupees through input dialog and select foreign currency to which Indian rupees are converted using drop down menu.	CO6	7 Marks
		UNIT-III		
5		Develop a mobile optimized website for displaying the images using responsive classes.	CO5	14 Marks
		(OR)		
6		Develop Contact Us Web Page using the grid system in bootstrap.	CO5	14 Marks
		UNIT-IV		
7	a)	Build a PHP Page that reads User Name and Favorite Color from the html form and then display user name in green color and sets user favorite color as a background color to the web page	CO4	8 Marks
	b)	Demonstrate the implementation of Object Cloning in PHP.	CO1	6 Marks
		(OR)		
8	a)	Develop a PHP code to implement multi-level inheritance.	CO3	8 Marks
	b)	Demonstrate OOP principles with suitable example using PHP	CO1	6 Marks
		UNIT-V		
9	a)	Define a prepared statement. Explain in detail with the suitable program.	CO3	7 Marks
	b)	Create a web page to perform form data validation in PHP.	CO4	7 Marks
		(OR)		
10	a)	List the different authentication methodologies used in PHP.	CO1	7 Marks
	b)	Design a web page to store the contact us form data in the database using PHP. (Note: contact us page contains the following fields Name, Email, subject, message and submit button).	CO3	7 Marks

CODE No.: 16BT51501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC16) Supplementary Examinations August – 2021

COMPILER DESIGN

[Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the different phases of a compiler, showing the output of each phase using the example of the following statement: position : = initial + rate x 60	CO1	8 Marks
	b)	Compare compiler and interpreter with suitable diagrams.	CO1	6 Marks
		(OR)		
2	a)	What is the role of the lexical analyzer? Explain Compiler construction tools.	CO5	7 Marks

	b)	Identify the token and lexemes in the following function:
		intgcd (int m, int n)
		{
		if n == 0 then return (m);
		else return (gcd (n, m mod n));
		}
			CO1	7 Marks

UNIT-II

3	a)	Construct the predictive parsing table for the following grammar. ***S →iEtSS/ a, S→iEtSSeS/ e, E→b***	CO3	6 Marks
	b)	Explain about Left Recursion.	CO1	8 Marks
		(OR)		
4	a)	Explain the basic operations of Shift Reduce Parser and perform Shift Reduce Parsing of the input string "id_1 - id_2 * id_3" by conserving the grammar E→E- E E→E*E E→id	CO3	7 Marks
	b)	Explain a method how ambiguous grammar's can be parsed with an example.	CO1	7 Marks

UNIT-III

5	a)	Write a note on the specification of a simple type checker using example.	CO4	7 Marks
	b)	What is a type expression? Explain the equivalence of type expressions with an appropriate example.	CO1	7 Marks
		(OR)		
6	a)	Write notes on type conversion.	CO1	7 Marks
	b)	Describe about type expressions.	CO1	7 Marks

UNIT-IV

7		Explain the usage of different storage allocation strategies.	CO6	14 Marks
		(OR)		
8	a)	Explain about Runtime storage administration.	CO6	7 Marks
	b)	Write about different data structures suitable for Symbol Table.	CO1	7 Marks

UNIT-V

9	a)	Describe about principal sources of optimization.	CO1	7 Marks
	b)	Explain the different issues in the design of a code generator.	CO1	7 Marks
		(OR)		
10		Generate and Analyze the code for the following C statements: i) $x = f(a) + f(a) + f(a)$. ii) $x = f(a)/g(b,c)$. iii) $x = f(f(a))$.	CO2	14 Marks

CODE No.: 16BT51541 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August - 2021

MODELING AND SIMULATION
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Name several entities, attributes, activities, events and state variables for the following systems. CO1 9 Marks
   i) A cafeteria.
   ii) A grocery store.
   iii) A hospital emergency room.

   b) What are the events and activities associated with the use of your check book? CO1 5 Marks

(OR)

2 Consider the following continuously operating job shop. Inter-arrival times of jobs are distributed as follows: CO2 14 Marks

Time Between Arrivals (Hours)	Probability
0	0.23
1	0.37
2	0.28
3	0.12

Processing times for jobs are normally distributed, with mean 50 minutes and standard deviation 8 minutes. Construct a simulation table and perform a simulation for 10 new customers. Assume that, when the simulation begins, there is one job being processed (scheduled to be completed in 25 minutes) and there is one job with a 50-minute processing time in the queue.

i) What was the average time in the queue for the 10 new jobs?
ii) What was the average processing time of the 10 new jobs?
iii) What was the maximum time in the system for the 10 new jobs?

UNIT-II

3 a) List and explain terminology and concepts of statistical models in simulation. CO1 9 Marks

   b) A production process manufactures alternators for outboard engines used in recreational boating. On the average, 1% of the alternators will not perform up to the required standards when tested at the engine assembly plant. When a large shipment of alternators is received at the plant, 100 are tested, and, if more than two are nonconforming, the shipment is returned to the alternator manufacturer. What is the probability of returning a shipment? CO3 5 Marks

(OR)

4	a)	Describe useful statistical models and its situations that arise to conduct simulation.	CO1	9 Marks
	b)	An industrial chemical that will retard the spread of fire in paint has been developed. The local sales representative has estimated, from past experience that 48% of the sales calls will result in an order. i) What is the probability that the first order will come on the fourth sales call of the day? ii) If eight sales calls are made in a day, what is the probability of receiving exactly six orders? iii) If four sales calls are made before lunch, what is the probability that one or fewer results in an order?	CO4	5 Marks

UNIT-III

5		Explain the characteristics of queueing systems.	CO1	14 Marks

(OR)

6	a)	Describe the long-run measures of performance of queueing systems.	CO1	7 Marks
	b)	With an example, explain the queueing notation.	CO1	7 Marks

UNIT-IV

7		With example, explain combined linear congruential generators for generating random numbers.	CO4	14 Marks

(OR)

8	a)	Describe important considerations of generating random numbers.	CO1	10 Marks
	b)	Generate random numbers on the interval [0, 1] with 2-digit accuracy.	CO4	4 Marks

UNIT-V

9		Synthesize a suitable method for collecting data from stale data and time varying data.	CO5	14 Marks

(OR)

10	a)	Explain the methods for selecting families of input distributions when data available is independent and identically distributed.	CO1	11 Marks
	b)	Design probability density functions of the Erlang distribution where $\theta = 2$ and $k = 1, 2, 4$, and 8.	CO6	3 Marks

CODE No.: 16BT60402 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August - 2021

DIGITAL SIGNAL PROCESSING
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Given the sequence $x(n) = (6 - n)[u(n) - u(n - 6)]$, make a sketch of: i) $y(n) = x(4 - n)$. ii) $y(n) = x(n^2 - 2n + 1)$.	CO4	8 Marks
	b)	State and prove any two properties of DTFT.	CO2	6 Marks
		(OR)		
2	a)	State and prove the necessary and sufficient condition for causality of an LTI discrete time system.	CO2	7 Marks
	b)	The system is represented by the difference equation: $y(n) = x(n+1) + 3x(n) + 5x(n - 1)$ Is the system causal, stable, and time invariant? Justify your answer.	CO4	7 Marks

UNIT-II

3	a)	Determine the circular convolution of the sequences. $X_1(n) = \{1, 1, -1, -1\}$ and $X_2(n) = \{1, 0, -1, 0, -1\}$	CO2	8 Marks
	b)	Sketch the radix 2 DIF FFT structure when N=16.	CO1	6 Marks
		(OR)		
4	a)	Draw the radix 2 DIT FFT structure when N=16.	CO1	7 Marks
	b)	State and prove the circular time shifting property of DFT.	CO2	7 Marks

UNIT-III

5	a)	Convert the analog filter into digital filter whose system function is $H(s) = \frac{(s + 0.2)}{(s + 0.2)^2 + 9}$ using impulse invariant method.	CO5	7 Marks
	b)	Derive an expression for order of the chebhyshev analog prototype filter.	CO2	7 Marks
		(OR)		
6	a)	Using bilinear transformation design a digital bandpass butter worth filter with the following specifications. sampling frequency=8KHz. αp=2dBin passband 800Hz≤f≤1000Hz. αs=20dB in stopband $0 \le f \le 400$Hz and $200\text{Hz} \le f \le \infty$.	CO5	10 Marks
	b)	Discuss transpose form of second order IIR system realizations.	CO2	4 Marks

UNIT-IV

7	a)	Distinguish the window functions used in the design of FIR filters.	CO2	7 Marks
	b)	Design a linear phase FIR Lowpass filter using rectangular window with cut off frequency Wc=0.2π rad/sample and $N = 7$.	CO3	7 Marks
		(OR)		
8	a)	Design Low pass FIR filter for the desired frequency response $H_d(w) = \begin{cases} e^{-j2w} & -\pi/4 \le \omega \le \pi/4 \\ 0 & \pi/4 \le \omega \le \pi \end{cases}$ using Rectangular window when N=5.	CO3	7 Marks
	b)	Design a linear phase FIR bandstop filter to reject frequencies in the range 0.35π to 0.48π rad/sample by taking 75 samples of rectangular window.	CO3	7 Marks

UNIT-V

9	a)	Write the silent features of TMS320C6X family of digital signal processor.	CO1	7 Marks
	b)	Explain various types of general purpose register in TMS320C6X.	CO1	7 Marks
		(OR)		
10	a)	Elaborate any three special purpose addressing mode in DSP processors.	CO1	7 Marks
	b)	Discuss in detailed about pipelining of instruction execution in DSP processor.	CO1	7 Marks

CODE No.: 16BT60404 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August - 2021

IMAGE PROCESSING
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Write the Applications of Image Transforms.	CO6	6 Marks
	b)	Write the Properties of 2-D DFT. i) Scaling. ii) Shifting. iii) Rotation. iv) Convolution.	CO1	8 Marks
		(OR)		
2	a)	Explain about image sampling and quantization and write its applications in communication.	CO6	7 Marks
	b)	Apply Walsh Transform for the given image F = [0 1 3 6] and write the transformed image.	CO5	7 Marks

UNIT-II

3	a)	Compare different enhancement techniques in frequency domain.	CO2	7 Marks
	b)	Distinguish between image smoothening and sharpening and perform the correspondence between filtering in the spatial and frequency domains.	CO2	7 Marks
		(OR)		
4	a)	State and explain any two smoothing linear filter.	CO1	7 Marks
	b)	Distinguish between spatial domain and frequency domain techniques of image enhancement.	CO2	7 Marks

UNIT-III

5	a)	Explain about constrained least squares restoration process for image restoration.	CO1	7 Marks
	b)	Write the algorithm used in adaptive filters whose behavior changes based on stastical characteristics.	CO3	7 Marks
		(OR)		
6	a)	Distinguish between Inverse filtering, wiener filtering and Constrained least squares filtering.	CO3	7 Marks
	b)	Develop algorithm for adaptive median filter for restoration of an image.	CO3	7 Marks

UNIT-IV

7	a)	Calculate the code interval for the source with symbols S1, S2, S3, S4, S5 using arithmetic coding.	CO4	7 Marks
	b)	Explain dictionary based compression technique.	CO1	7 Marks
		(OR)		
8	a)	What is meant by lossy compression? Discuss about transform coding.	CO1	7 Marks
	b)	Write a short notes on: i) Inter pixel redundancy. ii) Psychovisual Redundancy.	CO1	7 Marks

UNIT-V

9	a)	Apply various techniques in Color transformations in image processing.	CO5	7 Marks
	b)	Explain the concept of motion in segmentation. What is its use?	CO1	7 Marks
		(OR)		
10	a)	Define an edge in a digital image. What are the derivative operators useful in image segmentation and explain their role in segmentation?	CO1	7 Marks
	b)	What are the techniques used in image processing to describe point, line and edge detection?	CO5	7 Marks

CODE No.: 16BT60503 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations August - 2021

WIRELESS NETWORKS
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Write about wireless data services.	CO1	7 Marks
	b)	Demonstrate the functionalities of 2G Digital Cellular Standards.	CO2	7 Marks
		(OR)		
2	a)	Differentiate Voice-Oriented and Data-Oriented Access.	CO2	10 Marks
	b)	Solve interference issues using Wireless LAN Standards.	CO4	4 Marks
		UNIT-II		
3	a)	Compare Ad-Hoc and Infrastructure topology.	CO2	10 Marks
	b)	Why band splitting is not used in 2G cellular networks.	CO1	4 Marks
		(OR)		
4	a)	Evaluate five different cell types in the cellular hierarchy and compare them in terms of coverage and antenna site.	CO5	7 Marks
	b)	How to improve the capacity of a cellular network.	CO1	7 Marks
		UNIT-III		
5	a)	Draw and explain the Reference Architecture of IEEE 802.11.	CO1	7 Marks
	b)	Illustrate the concept of Carrier sensing.	CO2	7 Marks
		(OR)		
6	a)	Categorize various Physical specification of DSSS	CO2	8 Marks
	b)	What is the PCF in 802.11, what services does it provide, and how is it implemented?	CO1	6 Marks
		UNIT-IV		
7	a)	With suitable diagram explain the subsystems of GSM Architecture.	CO1	10 Marks
	b)	Apply the framing structure in GSM in mobile Applications.	CO5	4 Marks
		(OR)		
8	a)	Analyze the reasons to perform handoff.	CO2	8 Marks
	b)	Choose the services of GSM suitable for current data networks.	CO6	6 Marks
		UNIT-V		
9	a)	With neat sketch explain the basic architecture of a WATM network.	CO1	8 Marks
	b)	Design solutions for Privacy in SWAN and WATM systems	CO3	6 Marks
		(OR)		
10		Considering that the encoded voice in Bluetooth is at 64Kbps in each direction. Find the following: i) Use packet format for the HV1 channels to show that these packets are sent every six slots. ii) Use packet format for the HV2 channel to find how often these packets are sent.	CO4	14 Marks

CODE No.: 16BT3HS02 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

MANAGERIAL ECONOMICS AND PRINCIPLES OF ACCOUNTANCY
[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks

UNIT-I

1	Define Demand and explain factors that determining demand with examples.	CO1	14 Marks
	(OR)		
2	What is meant by Demand Forecasting? Why it is important for the managers of the business firm?	CO2	14 Marks

UNIT-II

3	Distinguish between Average Cost and Marginal Cost in detail with diagrammatic representation.	CO1, CO2	14 Marks
	(OR)		
4	From the following particulars, find: a) Contribution. b) P/V ratio. i) Variable cost per unit Rs.40 ii) Selling Price per unit Rs.80 iii) Fixed expenses Rs.2,00,000 iv) Output Rs.10,000	CO2	14 Marks

UNIT-III

5	Explain the Objectives and types of pricing with suitable examples.	CO1	14 Marks
	(OR)		
6	Explain the Price and Output determination in short run and long run under Perfect competition.	CO1	14 Marks

UNIT-IV

7	What is Account. Explain its types and principles.	CO1	14 Marks
	(OR)		
8	Define Capital. Explain its types and sources with examples.	CO1	14 Marks

UNIT-V

9	Discuss the items in Profit and Loss account Proforma detailly.	CO1	14 Marks
	(OR)		

10 From the following, prepare a Trading account, Profit and Loss Account and Balance Sheet. CO4, CO5, CO6 14 Marks

Account statement as on 31st December, 2018.

Particulars	Rs.	Particulars	Rs.
Opening Stock	1,53,100	Capital	25,00,000
Purchase	8,24,000	Drawings	4,80,000
Sales	25,60,000	Sundry Debtors	5,70,000
Returns (Dr.)	40,000	Sundry Creditors	1,40,000
Returns (Cr.)	24,000	Depreciation	42,000
Factory Rent	1,80,000	Charity	5,000
Custom Duty	1,15,000	Cash Balance	44,600
Coal, Gas and Power	60,000	Bank Balance	40,000
Wages & Salary	3,66,000	Bank Charges	1,800
Discount (Dr.)	75,000	Establishment Expenses	36,000
Commission (Cr.)	12,000	Plant	4,20,000
Bad-Debts	58,500	Leasehold Building	15,00,000
Bad-Debts Recovered	20,000	Goodwill	2,00,000
Apprentice Premium	48,000	Patents	1,00,000
Productive Expenses	26,000	Trade Marks	50,000
Unproductive Expenses	50,000	Loan Cr.	2,50,000
Carriage	87,000	Interest on Loan	30,000

The value of Closing Stock on 31st December, 2018 was Rs.2,54,000.

CODE No.: 16BT5HS01 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

MANAGEMENT SCIENCE

[Computer Science and Engineering, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Elaborate and list Frederick Winslow Taylor principles of scientific management.	CO1	14 Marks
		(OR)		
2		What skills does a manager need for sustainable development of organizations?	CO5	14 Marks

UNIT-II

3	a)	Write short notes on ABC analysis.	CO1	4 Marks
	b)	Perform ABC analysis on the following sample of eight items from a warehouse.	CO5	10 Marks

Items	1	2	3	4	5	6	7	8
Annual Usage (Unit)	150	350	15	400	25	110	80	400
Unit Cost (Rs.)	8	13	5	13	7	25	18	8

(OR)

4		What are the functions of marketing and what is the role of marketing in an organization?	CO1	14 Marks

UNIT-III

5		Describe Herzberg's two factor theory, how is it important. Give an example.	CO3	14 Marks
		(OR)		
6		What is the difference between psychological and physiological need, give an example and describe Abraham Maslow's hierarchy of needs?	CO1	14 Marks

UNIT-IV

7		What are the character traits that set successful entrepreneurs?	CO1	14 Marks
		(OR)		
8	a)	Discuss the use of PERT/CPM techniques.	CO1	4 Marks
	b)	The schedule of various activities in a computer manufacturing unit.	CO1	10 Marks

Activity No.	0-1	1-2	0-3	2-5	3-4	4-5	5-6
Duration Days	2	4	2	1	2	5	3

i) Draw the network diagram corresponding to this project.
ii) Mark the critical path and total project duration.

UNIT-V

9	a)	Describe business process outsourcing, list risks and benefits of it.	CO3	7 Marks
	b)	Discuss the role of enterprise resource planning in industry.	CO5	7 Marks
		(OR)		
10	a)	Describe value chain analysis.	CO1	7 Marks
	b)	Discuss challenges of globalization for any organization.	CO5	7 Marks

CODE No.: 16BT5HS02 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

COSTING AND FINANCING MANAGEMENT FOR CIVIL ENGINEERS
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

	UNIT-I		
1	Define Cost estimation and write its importance in civil engineering projects?	CO1	14 Marks
	(OR)		
2	Write down the importance of Preliminary Estimates and what are the methods for preliminary estimates.	CO4	14 Marks
	UNIT-II		
3	Define Contract Costing and explain its features of Contract Costing.	CO4	14 Marks
	(OR)		
4	List out the costs attributable to contract account.	CO2	14 Marks
	UNIT-III		
5	What do you meant by Budgetary Control and Write down the benefits of Budgetary Control?	CO4	14 Marks
	(OR)		
6	Explain in detail about concept of Budget and classification of Budget.	CO3	14 Marks
	UNIT-IV		
7	Write a short note on Internal Rate of Return and Profitability Index.	CO2	14 Marks
	(OR)		
8	Write down the process involved in Capital Budgeting.	CO1	14 Marks
	UNIT-V		
9	Discuss in brief about Operating Cycle Concept.	CO2	14 Marks
	(OR)		
10	Define Working Capital and write down the issues involved in Working Capital Management.	CO3	14 Marks

CODE No.: 16BT40502 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

DATABASE MANAGEMENT SYSTEMS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What is Data Abstraction? Explain about different views of data.	CO4	7 Marks
	b)	Discuss about Database users and Administrators.	CO1	7 Marks
		(OR)		
2	a)	Write about logical database design (ER to Relational) with suitable examples.	CO1	7 Marks
	b)	Draw ER diagram for Ternary Relationship set with suitable example.	CO1	7 Marks

UNIT-II

3	a)	Explain in detail about expressive power of algebra and calculus.	CO4	7 Marks
	b)	Discuss about outer joins with examples.	CO2	7 Marks
		(OR)		
4	a)	Write about triggers and active databases.	CO3	7 Marks
	b)	How to list and update row in a table? Explain with syntax and examples.	CO2	7 Marks

UNIT-III

5	a)	What is meant by multivalued dependency? Explain with example.	CO2	7 Marks
	b)	Prove that any relation schema with two attributes is BCNF.	CO2	7 Marks
		(OR)		
6	a)	If R= {A, B, C, G, H, I} and FD's are F= {A◊B, B◊HI, CG◊H}, why R is not in 4NF?	CO2	7 Marks
	b)	What is meant by attribute closure? Explain.	CO3	7 Marks

UNIT-IV

7	a)	Explain transaction management with relevant concept.	CO5	7 Marks
	b)	Explain briefly normal forms with relevant example.	CO2	7 Marks
		(OR)		
8	a)	Explain ACID properties of transaction management.	CO5	7 Marks
	b)	Explain concurrency control with lock based protocols.	CO4	7 Marks

UNIT-V

9	a)	Discuss about file organizations and indexing.	CO1	7 Marks
	b)	Explain about Index structures.	CO5	7 Marks
		(OR)		
10	a)	Explain about linear hashing.	CO6	7 Marks
	b)	Explain about Delete and Duplicated in Tree Structured Indexing.	CO5	7 Marks

CODE No.: 16BT41204 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

THEORY OF COMPUTATION
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Construct a Non-deterministic finite automaton accepting {ab, ba} and use it to find a DFA accepting the same set.	CO3	7 Marks
	b)	State and prove the equivalence of NFA with ε-transitions and NFA without ε-transitions.	CO1	7 Marks

(OR)

2	a)	Construct DFA for the given NFA where q_0 is the initial state and q_3 is a final state	CO3	7 Marks

	a	b	C
q_0	q_1	Φ	Φ
q_1	q_0	q_3	q_2
q_2	Φ	Φ	q_1
q_3	Φ	q_1	Φ

	b)	Design an NFA for the set of all strings over alphabet {0,1,2,3,4,5,6,7,8,9} such that the final digit has never appeared before.	CO4	7 Marks

UNIT-II

3	a)	Prove that (1+00*1) + (1+00*1) (0+10*1)*(1+10*1) = 0*1(0+10*1)*.	CO1	7 Marks
	b)	Construct a minimum state automaton equivalent to the FA given below. Here Q_0 is an initial state and Q_7 is a final state	CO5	7 Marks

State	0	1
Q_0	Q_1	Q_5
Q_1	Q_6	Q_2
Q_2	Q_0	Q_2
Q_3	Q_2	Q_6
Q_4	Q_7	Q_5
Q_5	Q_2	Q_6
Q_6	Q_6	Q_4
Q_7	Q_6	Q_2

(OR)

4	a)	Let r = 1 (1 + 0)*, s= 11*0 and t = 1 * 0 be three regular expressions. Find the relationship between L(r), L(s) and L(t).	CO2	7 Marks
	b)	Construct regular expression for the following languages: i) the set of all strings with exactly 3 consecutive zeros, Σ={0,1}. ii) the set of all strings over {a,b} ending in 'aba'. iii) the set of all strings of {0,1,2} such that any number of 0's followed by any number of 1's followed by any number of 2's	CO2	7 Marks

UNIT-III

5	a)	Construct a CFG for the language L= { $a^n b^n$/ n ≥ 1} and construct a derivation tree for it. Is the grammar ambiguous?	CO3	7 Marks
	b)	Convert the following grammar to equivalent grammar to CNF S→bA/aB, A→bAA/ aS/a, B→aBB/bS/b.	CO5	7 Marks

(OR)

6	a)	Draw Parse tree and also show Left most derivation and Rightmost Derivation for the string (id + id * id) + (id * id * id) + id * id from the following CFG E →E + E / E * E / (E) / id	CO1	7 Marks
	b)	Design a grammar generating the language L={WCW^R / w ε { a,b}$^+$.	CO3	7 Marks

UNIT-IV

7	a)	Construct PDA for the Language L = {$a^m b^2 c^m$/ m ≥ 1}.	CO3	7 Marks
	b)	Construct an equivalent PDA for the following CFG S→bAA/a, A→aSA/b.	CO5	7 Marks

(OR)

8	a)	Construct Non deterministic PDA for Language L = {ww^r/w Є (a, b)*}	CO3	7 Marks
	b)	Give the CFG generating the language accepted by the following PDA. $\delta(q_0, 1, z_0)=\{(q_0, XZ_0)\}$, $\delta(q_0, 1, X)=\{(q_0, XX)\}$, $\delta(q_0, 0, X)=\{(q_1, X)\}\delta(q_0, \varepsilon, z_0)=\{(q_0, \varepsilon)\}$, $\delta(q_1, 1, X)=\{(q_1, \varepsilon)\}\delta(q_1, 0, z_0)=\{(q_0, Z_0)\}$.	CO5	7 Marks

UNIT-V

9	a)	Write the applications of TM and Construct a TM accepting the language L={$a^n b^n$/n ≥ 0}.	CO1	7 Marks
	b)	Design a TM over Σ={a,b} to accept the language L={wCw/wε {a,b}$^+$ }.	CO3	7 Marks

(OR)

10	a)	Define Turing Machine and Construct a TM accepting the language L={$a^n b^{m+n} c^m$/m, n ≥1}.	CO4	7 Marks
	b)	Write the mathematical model of a TM and what are the various programming techniques for constructing a Turing Machine.	CO1	7 Marks

CODE No.: 16BT50101 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

IRRIGATION ENGINEERING
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define Irrigation. List the advantages, disadvantages and purpose of irrigation.	CO1	7 Marks
	b)	Explain duty, delta and base period. Derive their relationship.	CO2	7 Marks
		(OR)		
2	a)	Describe with the help of sketch various forms of soil water. Which of this soil moisture is mainly vaiable for utilization by the plant?	CO1	7 Marks
	b)	An irrigation canal has gross commanded area of 70,000 hectares out of which 80% is culturable irrigable. The intensity of irrigation for Kharif season is 30% and for Rabi season 60%. Find the discharge required at the head of the canal if the duty at its head is 800 hectares/cumecs for Kharif season and 1700 hectares cumec for Rabi season.	CO3	7 Marks

UNIT-II

3	a)	Discuss the brief note on Khosla's theory of design of weirs on permeable foundation.	CO3	7 Marks
	b)	Define Barrage. How does a barrage differ from a weir and dam?	CO1	7 Marks
		(OR)		
4	a)	Discuss briefly the deign consideration of weir on permeable foundation.	CO3	7 Marks
	b)	List the limitation of Bligh's creep theory.	CO4	7 Marks

UNIT-III

5	a)	Classify various types of dams. Distinguish clearly between rigid and non-rigid dams.	CO2	7 Marks
	b)	Explain gravity dam. Disuses the various forces acting on gravity dam with figure.	CO3	7 Marks
		(OR)		
6	a)	Explain the criteria of the safe design of earthen dam.	CO4	7 Marks
	b)	A masonry dam 6m high is 1.5m wide at top and 4.5m wide at the bottom, with vertical water face. Determine the normal stresses at the toe and heel for reservoir empty. Take ρ=2.4 and c=1.	CO3	7 Marks

UNIT-IV

7	a)	Define canal and explain the different types of canal.	CO2	7 Marks
	b)	Explain lined and unlined canal and list the different materials used for lining of the canal.	CO1	7 Marks
		(OR)		
8	a)	Define canal outlet. Explain different types of canal outlets with figure.	CO2	7 Marks

	b)	Explain the procedure of designing a channel with Kennedy's theory.	CO3	7 Marks

UNIT-V

9	a)	Classify river training works and discuss any one of the in details.	CO4	7 Marks
	b)	Explain the terms meandering type, aggrading type and degrading type.	CO2	7 Marks

(OR)

10	a)	List the causes for failure of cross drainage work.	CO4	7 Marks
	b)	Design waterway and head loss through a syphon aqueduct if the following data at the crossing of a canal and a drainage are given: i) discharge of canal is 40 cumecs, ii) bed width of canal is 30 m, iii) full supply depth of canal is 1.6 m, iv) bed level of canal is 206.4 m, v) side slope of canal is 3/2H:1 V, vi) high flood discharge of drainage is 450 cumecs, vii) high flood level of drainage is 207.0 m, viii) bed level of drainage is 204.5 m, ix) general ground level is 206.5 m.	CO4	7 Marks

CODE No.: 16BT50102 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January – 2022

REINFOCED CEMENT CONCRETE STRUCTURES
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What are the advantages of limit state method over working stress and ultimate load methods?	CO1	5 Marks
	b)	What are the assumptions in working stress method?	CO1	5 Marks
	c)	Explain mode of failures of sections.	CO1	4 Marks
		(OR)		
2	a)	Determine the ultimate flexural strength of the T-beam having the following section parameters. Width of the flange – 800 mm, depth of the flange-150 mm, width of the rib-300 mm, effective depth- 420 mm, area of the steel-1250mm^2 use M-20 grade of concrete and Fe-415 HYSD bar.	CO3	7 Marks
	b)	A reinforced concrete beam having breadth 230 mm and factored moment 100 kN-m. Use M25 concrete and Fe 500 steel. Calculate the area of steel in the section and cross section of beam.	CO3	7 Marks

UNIT-II

3	a)	How will you calculate the effective width of T and L-beam? Define each parameter.	CO1	5 Marks
	b)	What is shear reinforcement? Write the provisions to calculate shear reinforcement.	CO1	5 Marks
	c)	Explain the objectives of design. Also explain the advantages of RCC.	CO1	4 Marks
		(OR)		
4		A T-beam slab floor of reinforced concrete has a slab of 150 mm thick spanning between the T–beam which is spaced 3 m apart. The beam has a clear span of 10 m and the end bearings are 450 mm thick walls. The live load on the floor is 4kN/m^2. M-20 grade of concrete and Fe-415 HYSD bars. Design one the intermediate T-beams	CO3	14 Marks

UNIT-III

5	a)	Enumerate the code provisions for minimum reinforcement to be provided as primary and secondary reinforcement in R.C. slab.	CO5	5 Marks
	b)	Differentiate one-way slab and two-way slab.	CO1	5 Marks
	c)	With a neat sketch, write the values of moment and shear coefficients of continuous slab.	CO1	4 Marks
		(OR)		
6		Design a simply supported R.C.C slab for an office floor having clear dimensions of 4 m by 10 m with 230 mm wall around. Adopt M-20 grade concrete and Fe-425 grade HYSD bears.	CO3	14 Marks

UNIT-IV

7	a)	Classify the columns based on loadings and slenderness ratios.	CO1	5 Marks
	b)	What is meant by unsupported length of a column?	CO1	5 Marks
	c)	What is meant by Effective length of a column?	CO5	4 Marks
		(OR)		

8		Design the reinforcement in a rectangular column of size 300 x 450 mm to support a design ultimate load of 400 kN, together with a factored moment of 200 KN-m. Adopt M-20 grade concrete and Fe-415 grade HYSD bears. Sketch the details of reinforcement. Use SP-16 chart.	CO3	14 Marks

UNIT-V

9	a)	What are the types of stair case according to spanning? Explain with neat sketches.	CO1	5 Marks
	b)	What are the critical sections of determining the bending moment in isolated footing?	CO1	5 Marks
	c)	How would you determine the minimum depth of foundation?	CO7	4 Marks

(OR)

10		Design an isolated square sloped footing for a square column of size 450 mm x 450 mm. for an axial factored load of 1600 KN. Use M20 concrete and Fe415 steel. The S.B.C of soil is 200 kN/m^2.	CO3	14 Marks

CODE No.: 16BT50103 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC16) Supplementary Examinations January – 2022

SOIL MECHANICS
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

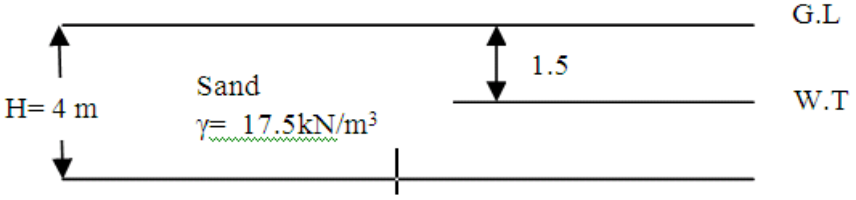
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Derive the relation $\gamma d = \frac{(G + Se)\gamma_w}{1+e}$. Where γ_d = dry unit weight, G = specific gravity of solids, γ_w = unit weight of water.	CO2	7 Marks
	b)	A sample of clay having mass of 675 g coated with paraffin wax. The combined mass of clay and the wax was found to be 682 g. The volume was found by immersion in water as 345 ml. The sample was having water content of 15% and specific gravity of 2.67. Calculate the bulk density of soil, its void ratio and degree of saturation. Take specific gravity of wax as 0.89.	CO2	7 Marks
		(OR)		
2	a)	Define the following terms. i) Plasticity index. ii) Consistency Index. iii) Toughness Index. iv) Activity of soil.	CO2	6 Marks
	b)	An earthen embankment of 1,00,000 m^3 volume is to be constructed with a soil having void ratio of 0.75 after compaction. There are three borrowing pits marked A, B and C having soils with void ratio of 0.90, 1.50 and 1.80 respectively. The cost of excavation and transporting the soil for borrow pits are Rs. 0.25, Rs. 0.23 and Rs. 0.21 per m^3 respectively. Which borrow pit is the most economical. (Take G = 2.65).	CO4	8 Marks

UNIT-II

3	a)	Explain the following factors that affect the permeability of soil. i) Void ratio. ii) Particle size. ii) Properties of fluid. iii) Clay structure.	CO2	6 Marks
	b)	Calculate the coefficient of permeability of a sand sample having height and diameter of 10cm and 8cm respectively. A discharge of 900 ml was collected in 15 minutes under an effective head of 70cm. If the weight of the oven dried sample was 800g, then calculate the seepage velocity. Take G= 2.70.	CO2	8 Marks
		(OR)		
4	a)	Define quick sand condition. Derive the formula for critical hydraulic gradient.	CO2	7 Marks
	b)	Draw total stress, effective stress and pore water pressure diagrams for the following case. If the water is lowered by 0.5 m, what is the change in effective stress at 4 m from ground level?	CO2	7 Marks



UNIT-III

5	a)	Explain in brief about the effect of compaction on soil properties.	CO2	7 Marks
	b)	Derive an expression for vertical stresses under a circular load using Boussinesq's theory.	CO2	7 Marks

(OR)

6	a)	Discuss about the following approximate methods with neat sketch. i) Equivalent point method. ii) Two-to-one load distributed method.	CO2	6 Marks
	b)	Determine the vertical stress increase at a depth of 1.5m beneath the centre of square footing of width 3m and with load intensity of 200 kN/m^2.	CO3	8 Marks

UNIT-IV

7	a)	Discuss about the spring analogy for primary consolidation with a neat sketch.	CO2	7 Marks
	b)	What are the assumptions of Terzaghi's theory of one-dimensional consolidation?	CO2	7 Marks

(OR)

8	a)	Explain about the laboratory consolidation test with a neat sketch.	CO4	7 Marks
	b)	A new building was constructed on 3m thick soft clay. The over burden pressure over centre of the soft clay is 280 kN/m^2. Compute the settlement if there is increase in pressure due to construction is 115 kN/m^2. The water content and compression index of the given soil are found to be 50% and 0.50 respectively. Take G = 2.67.	CO3	7 Marks

UNIT-V

9	a)	Derive an equation for finding out shear strength of soft clays using vane shear test.	CO4	6 Marks
	b)	Explain in brief about unconfined compression test with a neat sketch. What are its merits and demerits?	CO4	8 Marks

(OR)

10	a)	What are the advantages and disadvantages of a triaxial test?	CO4	6 Marks
	b)	Direct shear tests on specimens of fine sand gave the following data	CO3	8 Marks

Normal stress(kN/m^2)	100	175
Shear stress at failure(kN/m^2)	17.7	19.8

Find the shear strength of soil at a depth of 5 m from G. L., if the void ratio = 0.7, specific gravity G = 2.67 and GWL is at a depth of 2 m from ground surface.

Note: Provide normal graph sheet.

CODE No.: 16BT50104 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January – 2022

STRUCTURAL ANALYSIS–II
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	i) What are the conditions for influence line diagram of shear and bending in a simply supported beam? ii) Define the Influence Line Diagram (ILD). Mention the types of loads that are analysed using ILD.	CO1	6 Marks
	b)	Draw the Influence Line Diagrams for Bending Moment and Shear Force at a section 4m from the left support of a simply supported beam of span 10m. If a moving UDL of intensity 18 kN/m and length 8m crosses the beam, what will be the absolute maximum values of S.F and B.M at the section.	CO2	8 Marks

(OR)

2	a)	Two-point loads of 100kN and 200kN spaced 3m apart cross a girder of span 15m from left to right with the 100kN load leading. Draw the ILD for S.F and B.M at 5m from left support. Find: i) Maximum absolute +ve S.F at C. ii) Maximum absolute +ve S.F at C. Maximum absolute B.M at C	CO2	6 Marks
	b)	A system of four loads 80kN, 160kN, 160kN, 120kN crosses a simply supported beam of span 25m with the 120kN load leading. The loads are equally spaced at 1m. Determine the values of the maximum bending moment and shear force at a section 10m from left support and absolute maximum shear force and bending moment in the beam uniform ILD.	CO2	8 Marks

UNIT-II

3		Analyse the two–span continuous beam shown in Figure 1 by slope deflection method and draw the bending moment and shear force diagrams.	CO6	14 Marks

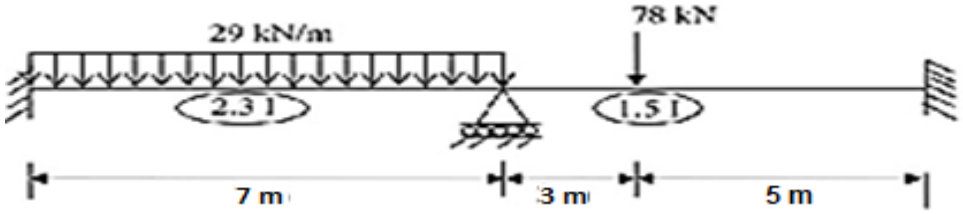


Figure 1

(OR)

4		Analyse the continuous beam shown in Figure 2 by using moment distribution method and draw the bending moment diagram.	CO6	14 Marks

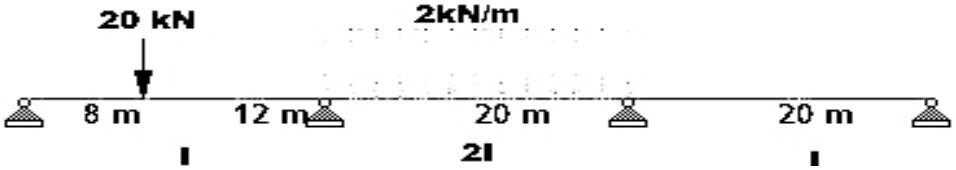


Figure 2

UNIT-III

5 Analyse the continuous beam shown in Figure 3 by Kani's method. CO4 14 Marks

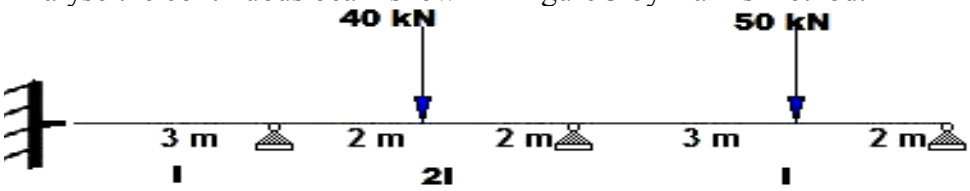


Figure 3

(OR)

6 a) Derive the expression for strain energy due to bending moment. CO1 7 Marks

b) Determine the deflection of the free end of a cantilever of length 'L' subjected to a uniformly distributed load '*w*" on entire span using strain energy method. CO2 7 Marks

UNIT-IV

7 Explain with an example the following: CO5 14 Marks

i) Determinate and indeterminate structures.
ii) Static indeterminacy.
iii) Kinematic indeterminacy.

(OR)

8 Analyze the truss shown in Figure 4 below by Castigliano's theorem. Area of cross section of members in mm^2 is shown in Figure 4. E is constant throughout. CO4 14 Marks

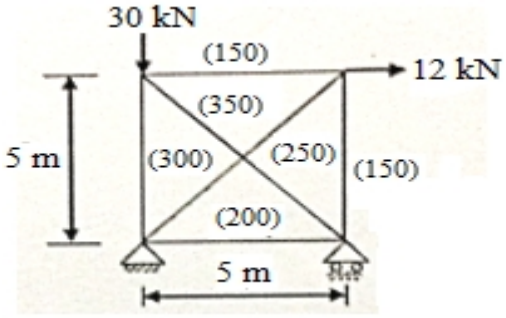


Figure 4

UNIT-V

9 a) Define plastic hinge, plastic moment capacity and shape factor. CO1 7 Marks

b) Determine the collapse load of a propped cantilever beam shown in Figure-5. CO3 7 Marks

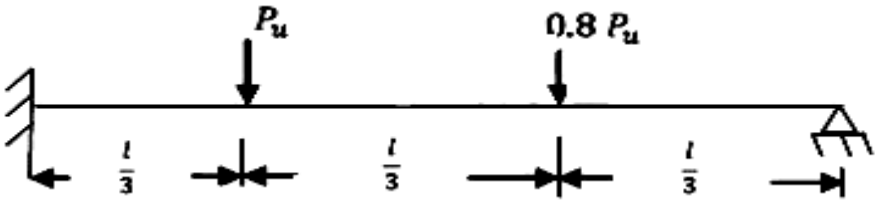


Figure 5

(OR)

10 Calculate the plastic moment capacity required for the continuous beam with working loads shown in Figure 6. CO3 14 Marks

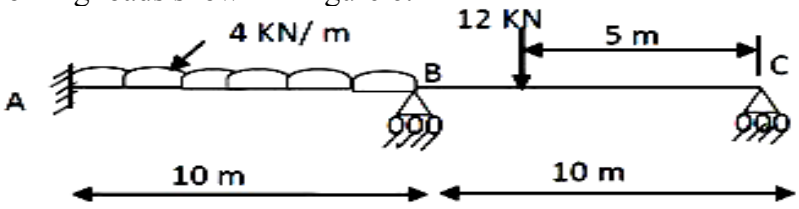


Figure 6

CODE No.: 16BT50105 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

WASTEWATER TECHNOLOGY
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	State the merits and demerits of: i) Separate System of Sewerage. ii) Combined System of Sewage.	CO1	7 Marks
	b)	Describe the conservancy and water carriage system of sanitation. In new developing town which method you will prefer and why?	CO1	7 Marks
		(OR)		
2	a)	Explain briefly effects of improper disposal of sewage. How the dissolved oxygen level is maintained in the stream?	CO1	7 Marks
	b)	Calculate the combined flow discharge of sewage for the given data. Area to be served is 150 hectares. Population is 50000. Time of entry and time of flow is 5 and 20 minutes respectively; rate of water supply is 135 LPCD. Impermeability factor, C = 0.45. Assume 80% of water supplied turns into sewer and peak factor as 1.5.	CO1	7 Marks

UNIT-II

3	a)	Design a primary sedimentation tank for a proposed sewage treatment plant of 120 MLD capacity.	CO2	7 Marks
	b)	Explain the conventional treatment process of municipal wastewater treatment plant with flow diagram.	CO2	7 Marks
		(OR)		
4	a)	What do you understand by self-purification property of streams? Explain the factors affecting this property.	CO2	7 Marks
	b)	Explain the importance of study of reoxygenation and deoxygenation in the problem of stream sanitation.	CO2	7 Marks

UNIT-III

5	a)	Write the procedure for design of standard trickling filter.	CO3	7 Marks
	b)	Differentiate attached growth process and suspended growth process.	CO3	7 Marks
		(OR)		
6	a)	Describe in detail about an oxidation pond.	CO3	7 Marks
	b)	Design activated sludge plant to treat 5 millions liters of sewage per day having 5 days of BOD of 140mg/l. Assume suitable data where ever required.	CO3	7 Marks

UNIT-IV

7	a)	What is sludge conditioning and dewatering? Explain any one of the methods of sludge dewatering.	CO4	7 Marks
	b)	Sludge disposal to an onsite create lot of problems to the community. What are the steps you suggest for the disposal and what is the mechanism involved in the process of removal of pathogenic bacteria from sludge.	CO4	7 Marks
		(OR)		
8	a)	Explain the process of removal of phosphorous and refractory organic materials.	CO4	7 Marks
	b)	Explain briefly the nitrogen removal by biological nitrification and denitrification.	CO4	7 Marks

UNIT-V

9	a)	Classify the various methods of sewage disposal.	CO5	7 Marks
	b)	Draw a typical oxygen sag curve and explain its meaning and state its importance in benefit of maintaining the DO in the river water for society.	CO5	7 Marks

(OR)

10	a)	Discuss various methods of disposal of septic tank effluent with neat sketches.	CO5	7 Marks
	b)	Design a septic tank with dispersion trench for 175 users. The rate of water supply is 70 LPCD. Assume suitable criteria as applicable. Draw a neat sketch of the unit.	CO5	7 Marks

CODE No.: 16BT50201 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC16) Supplementary Examinations January – 2022

CONTROL SYSTEMS

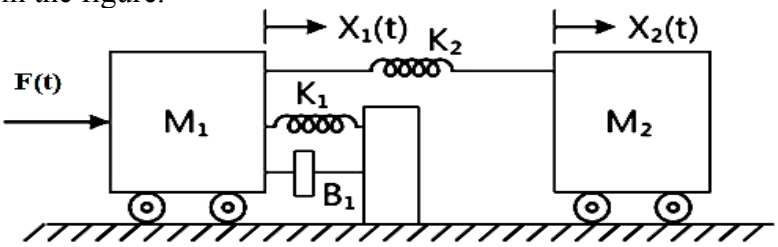
[Electrical and Electronics Engineering, Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

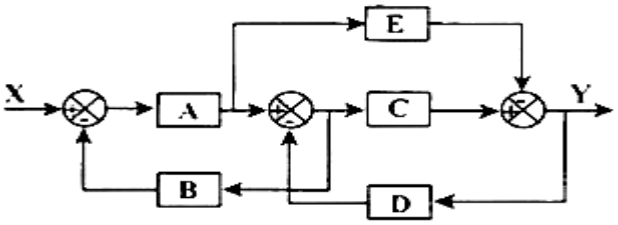
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Determine the Transfer function $\frac{X2(s)}{F(s)}$ for the Mechanical system as shown in the figure. CO4 6 Marks

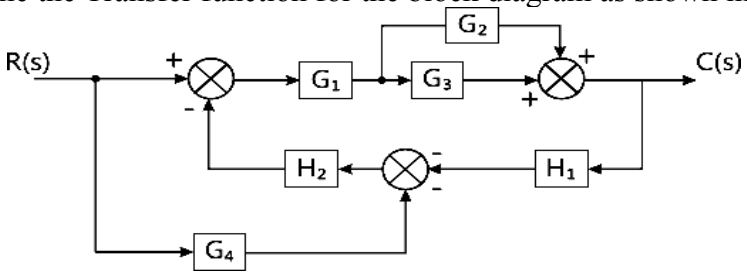


b) Obtain the overall Gain for the block diagram in the figure below using Mason's gain formula. CO4 8 Marks



(OR)

2 a) Determine the Transfer function for the block diagram as shown in figure. CO4 10 Marks

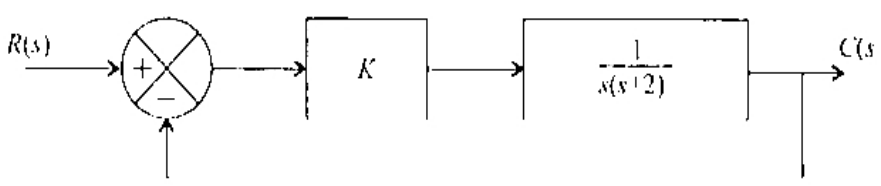


b) Mention any three disadvantages of block diagram reduction technique. CO1 4 Marks

UNIT-II

3 a) For the block diagram shown in figure, calculate the value of K under the following cases. CO2 8 Marks

i) Peak overshoot of 50%.
ii) Steady state error of 0.6 due to ramp input.



b) Calculate the range of gain K for the system to be stable whose characteristic equation is $S^4 + S^3 + 3S^2 + K(S+4) = 0$. CO2 6 Marks

(OR)

4	a)	Sketch the Root locus for the system having open loop transfer function $G(s) = \frac{K}{s(s+4)(s+6)}$.	CO2	10 Marks
	b)	Explain the effects of adding a pole on the Root loci.	CO2	4 Marks

UNIT-III

5	a)	Determine the stability of the system having open loop transfer function $G(s) = \frac{10}{s(s+10)(s+0.1)}$ using Bode plot.	CO2	10 Marks
	b)	Mention the necessary conditions for stability with respect to Bode plot.	CO2	4 Marks

(OR)

6	a)	Sketch the polar plot for the transfer function $G(s) = \frac{4}{(S-4)}$.	CO2	4 Marks
	b)	Analyze the closed loop system stability with Nyquist plot having open loop system transfer function $G(s) = \frac{4}{S(S-4)}$.	CO2	10 Marks

UNIT-IV

7	a)	Explain the importance of controllers in improving the performance of system with an example.	CO1	7 Marks
	b)	Analyze the characteristics of Lead-Lag compensator with magnitude plots.	CO2	7 Marks

(OR)

8	a)	Obtain the state space model for the Transfer function $\frac{Y(s)}{U(s)} = \frac{s+4}{s^3+6s^2+3s+4}$.	CO2	7 Marks
	b)	Elaborate the importance of Diagonalization in state space analysis. Diagonalizable the matrix. A= $\begin{bmatrix} 0 & 1 \\ 0 & -2 \end{bmatrix}$.	CO2	7 Marks

UNIT-V

9	a)	Calculate the Transfer function for the state model $\dot{X} = \begin{bmatrix} 0 & 1 \\ -6 & -2 \end{bmatrix} X + \begin{bmatrix} 1 \\ -2 \end{bmatrix} U \text{ and } Y = 0]X$	CO2	7 Marks
	b)	Compute the State Transition Matrix (STM) for A= $\begin{bmatrix} 1 & 1 \\ -6 & -2 \end{bmatrix}$ and mention the important properties of STM.	CO2	7 Marks

(OR)

10	a)	Obtain the Z.I.R for the state space model $\dot{X} = \begin{bmatrix} -1 & 0 \\ 0 & -4 \end{bmatrix} X + \begin{bmatrix} 1 \\ 2 \end{bmatrix} U \text{ and } Y = [2 \quad 3]X$ having $X(0) = \begin{bmatrix} 0 \\ 0.5 \end{bmatrix}$.	CO2	7 Marks
	b)	Obtain the Z.S.R for the state space model $\dot{X} = \begin{bmatrix} -1 & 0 \\ 0 & -4 \end{bmatrix} X + \begin{bmatrix} 1 \\ 2 \end{bmatrix} U \text{ and } Y = [2 \quad 3]X$ excited with unit impulse.	CO2	7 Marks

CODE No.: 16BT50202 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

POWER ELECTRONICS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Draw the symbol and characteristics of following switches. i) BJT. ii) Power MOSFET. iii) Power Diodes.	CO1	6 Marks
	b)	Derive and explain the two transistor analogy of SCR with neat diagram.	CO2	8 Marks
		(OR)		
2	a)	Explain the turn-on methods of SCR in detail.	CO1	8 Marks
	b)	What is snubber circuit? How a snubber circuit is designed?	CO3	6 Marks

UNIT-II

3		With neat waveforms, explain the configuration and operation of single phase half bridge rectifier with RL load. Derive the equations average voltage and average current.	CO2	14 Marks
		(OR)		
4		Analyze the operation of three phase six-pulse converter with R load with delay angle $\alpha = 60^0$ and plot the necessary waveforms. Determine the average load voltage and current.	CO5	14 Marks

UNIT-III

5	a)	Write short notes on the following single phase converters. i) Circulating current mode operation. ii) Non-Circulating current mode operation. iii) AC-AC voltage regulator. iv) AC-AC cyclo-converter.	CO1	12 Marks
	b)	Write the applications of AC-AC converters.	CO5	2 Marks
		(OR)		
6	a)	Derive the RMS voltage and current expressions for the single phase AC voltage controller.	CO6	7 Marks
	b)	What is the importance power factor? Explain the power factor improvement techniques.	CO4	7 Marks

UNIT-IV

7	a)	Explain the following forced commutation circuits with neat sketch. i) Class – A. ii) Class – D. iii) Class – E.	CO1	9 Marks
	b)	Explain the operation of DC morgan's chopper.	CO1	5 Marks
		(OR)		
8	a)	Explain with neat block diagrams. i) Frequency modulation control. ii) Peak current limit control.	CO4	6 Marks
	b)	A step-down chopper is operating at a frequency of 2kHz supplies a load of 10Ω and an inductance of 3mH from a 48V battery. Assume a freewheeling diode is connected across the load and 50% duty ratio. Calculate load voltage and load current.	CO4	8 Marks

UNIT-V

9	a)	Explain the basic operation of parallel inverter.	CO1	6 Marks
	b)	Write the comparisons between voltage source inverter and current source inverter.	CO1	8 Marks

(OR)

10		Explain the operation of three phase bridge inverter with 120^0 conduction mode with neat sketches. Write the difference between 120^0 and 180^0 conduction modes.	CO4	14 Marks

CODE No.: 16BT50203 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

SYNCHRONOUS MACHINES
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What are the advantages of stationary armature over the rotating armature?	CO1	4 Marks
	b)	What is meant by Distributed winding and Concentrated Winding? Derive the expression for Distribution factor (K_d) , Coil span factor (K_p) and induced **emf** in alternator.	CO4	10 Marks
		(OR)		
2	a)	Why harmonics are produced in generated **emf** and how they are suppressed?	CO1	6 Marks
	b)	A 4 pole, 50 HZ, 3-phase star connected alternator has a single layer winding with 21\slots per pole and 2 conductors per slot. The coil span is equal to 155^0 (Electrical). The fundamental flux is 0.6 Wb. The air gap flux contain a third harmonic of 20 % and fifth harmonic of 10 %. Find the: i) RMS value of induced **emf** per phase. ii) RMS value of induced **emf** when the winding is connected in Δ.	CO4	8 Marks

UNIT-II

3	a)	Explain the potier triangle method of finding Voltage regulation of given Synchronous Generator.	CO1	7 Marks
	b)	A salient pole synchronous generator has the following per unit parameters: X_d = 1.60, X_q= 1.00, R_a= 0.03. If this generator is delivering rated KVA at rated voltage and at 0.8 pf leading, compute the power angle and the excitation EMF. Draw the phasor diagram.	CO4	7 Marks
		(OR)		
4		A 30KVA, 440V, 50Hz, 3-phase star connected alternator has the following test data	CO4	14 Marks

Field Current(A)	2	4	6	7	8	10	12	14
Terminal Voltage (V)	155	287	395	440	475	530	570	592
Short Circuit Current(A)	11	12	34	40	46	57	69	80

Resistance between any two terminals is 0.3Ω. Find the regulation at full load, 0.8 power factor lag and lead by synchronous impedance method and MMF method.

UNIT-III

5	a)	What is short circuit ratio and its significance? Show that SCR is reciprocal of Synchronous impedence in PU.	CO1	7 Marks
	b)	Why it is necessary to run alternators in parallel? Explain clearly the terms: i) Synchronous current. ii) Synchronous Power. iii) Synchronous Torque.	CO1	7 Marks
		(OR)		

6	a)	Explain the method of synchronization of 3-phase alternator by Lamp method.	CO1	7 Marks
	b)	A 750 KVA, 11 KV,4 pole, 3-Φ star connected alternator has % resistance and reactance of 1 and 15Ω respectively. Calculate the synchronizing power per mechanical degree of displacement at: i) no-load. ii) at full load 0.8 pf lag. The terminal voltage in each case is 11 KV.	CO4	7 Marks

UNIT-IV

7	a)	Explain the principle of operation of 3-phase Synchronous motor.	CO1	7 Marks
	b)	A 2000V, 3-phase star connected Synchronous motor has an effective resistance and synchronous reactance of 0.2Ω and 2.2Ω per phase respectively. The input is 800KW at normal voltage and the induced line emf is 2400V. Calculate the line current and power factor.	CO4	7 Marks

(OR)

8	a)	Prove that locus of extremity of current phasor is a circle for a particular excitation and for change in load on shaft.	CO2	7 Marks
	b)	An Industrial plant has a load of 800KW at a power factor of 0.8 lagging. It is desired to propose a synchronous motor of sufficient capacity to deliver a load of 200KW and also to correct the overall power factor 0.92. Assuming that the synchronous motor has an efficiency of 90%, determine its KVA input rating and the power factor at which it will operate.	CO4	7 Marks

UNIT-V

9	a)	Explain about the design modification required by the DC series motor to operate with AC supply.	CO2	7 Marks
	b)	Explain about the construction and principle of operation of reluctance motor with a neat sketch.	CO1	7 Marks

(OR)

10	a)	Explain why a single phase induction motor is not self-starting using 2 revolving field theory.	CO1	7 Marks
	b)	Explain with neat diagrams of shaded pole induction motor and also its applications.	CO1	7 Marks

CODE No.: 16BT50241 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

RENEWABLE ENERGY
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	What are the advantages and limitations of renewable energy resources?	CO1	7 Marks
	b)	What are the reasons for variation in solar radiation reaching the earth than received at outside of the atmosphere?	CO1	7 Marks
		(OR)		
2	a)	Describe in detail in detail about ocean energy sources and their availability and also list its applications.	CO2	7 Marks
	b)	Write a short note on Wind Energy.	CO1	7 Marks
		UNIT-II		
3	a)	What are the main components of a flat-plate solar collector, explain the function of each with the help of a diagram.	CO2	7 Marks
	b)	Classify methods of solar energy storage. Describe thermal energy storage system.	CO1	7 Marks
		(OR)		
4	a)	Describe the layout and working of a continuous solar cooling system.	CO2	7 Marks
	b)	Describe a non-convective solar pond for energy collection and storage.	CO1	7 Marks
		UNIT-III		
5	a)	How wind energy conversion systems are classified? Discuss in brief.	CO1	7 Marks
	b)	What are the environmental aspects of wind energy conversion systems?	CO5	7 Marks
		(OR)		
6	a)	Describe Binary cycle system for liquid dominated system.	CO1	7 Marks
	b)	Classify geothermal sources and explain about each in brief.	CO1	7 Marks
		UNIT-IV		
7	a)	What is the basic principle of Ocean Thermal Energy Conversion? Explain.	CO1	7 Marks
	b)	What are the various methods used to generate power from tides? Explain about any one method in detail.	CO1	7 Marks
		(OR)		
8	a)	Write a short note on small head hydro power plants.	CO1	7 Marks
	b)	What are the advantages and limitations of wave energy conversion?	CO2	7 Marks
		UNIT-V		
9	a)	What is meant by anaerobic digestion? What are the factors that affect bio digestion?	CO3	7 Marks
	b)	What is meant by aerobic digestion? Explain its significance in nature.	CO1	7 Marks
		(OR)		
10	a)	Explain the constructional details and working of a biogas plant.	CO1	10 Marks
	b)	Give a list of the materials used for biogas generation.	CO4	4 Marks

CODE No.: 16BT50301 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

DESIGN OF MACHINE ELEMENTS-II
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What are the commonly used materials for sliding contact bearings? Also, list the important characteristics of good bearing material.	CO1	4 Marks
	b)	The following data is given for a 360° hydrodynamic bearing: Radial load =3.2 kN; Journal speed =1490 r.p.m; Journal diameter = 50mm; Bearing length = 50mm; Radial clearance = 0.05mm and viscosity of the lubricant = 25 cP. Assuming that heat generated in the bearing is carried by the total oil flow in the bearing, calculate: i) coefficient of friction. ii) power lost in friction. iii) minimum oil film thickness. iv) flow requirement in litres/min. v) temperature rise.	CO2	10 Marks

(OR)

2	a)	Differentiate between the following: i) Hydrostatic and hydrodynamic lubrication. ii) Thin film and thick film lubrication. iii) Bearing modulus and bearing characteristic number.	CO1	6 Marks
	b)	The radial load in a 360° hydrodynamic bearing is 10 kN and journal speed is 1440 r.p.m. The unit bearing pressure 1000 kPa and the bearing has L/D ratio of 1. The viscosity of lubricant is 30 cP and radial clearance of 0.025 mm. Calculate: i) the dimensions of bearing. ii) total flow of oil.	CO3	8 Marks

UNIT-II

3	a)	How do you express the life of a bearing? Explain the various factors that influence the life of a roller bearing	CO1	6 Marks
	b)	Determine the dynamic load carrying capacity of a deep-groove ball bearing, with the least bore size, and which is required to resist a radial load of 4 kN and an axial load of 3 kN. The shaft rotates at 1400 r.p.m. The bearing is required to be in operation for 12000 hours, with 90% reliability.	CO6	8 Marks

(OR)

4	a)	Write short notes on different types of antifriction bearings.	CO1	6 Marks
	b)	A single row deep groove ball bearing has a dynamic load capacity of 40500 N and operates on the following work cycle: i) radial load of 5000 N at 500 rpm for 25% of time. ii) radial load of 10000 N at 700 rpm for 50% of time. iii) radial load of 7000 N at 400 rpm for the remaining 25% of the time. Calculate the expected life of the bearing in hours.	CO3	8 Marks

UNIT-III

5	a)	Derive an expression for beam strength of a spur gear tooth (Lewis equation) using standard notations. State the assumptions under which this equation is valid.	CO1	6 Marks
	b)	It is desired to transmit 11 kW from a motor shaft rotating at 1440 r.p.m to a low speed shaft with a speed reduction of 3:1. Single stage spur gear drive is employed for this purpose. The gear teeth are 20° full depth involute. Pinion has 25 teeth. Starting torque is 50% higher than running torque. Both the pinion and gear are made of heat treated steel with a maximum allowable stress of 210 MPa. Design the suitable spur gear drive from the point of view of dynamic and wear strength.	CO3	8 Marks

(OR)

6		A pair of helical gears with 30° helix angle is used to transmit 15 kW at 10000 r.p.m of the pinion. The velocity ratio is 4:1. Both the gears are to be made of hardened steel of static strength 100 N/mm². The gears are 20° stub and pinion is having 20 teeth. The face width may be taken as 14 times the module. Find the module and face width from the standpoint of strength and check the gears for wear.	CO4	14 Marks

UNIT-IV

7	a)	Explain the following terms of the spring: i) Free length. ii) Solid length. iii) Active and inactive coils.	CO1	6 Marks
	b)	A helical spring is made from a wire of 6 mm diameter and has outside diameter of 75 mm. If the permissible shear stress is 350 N/mm² and modulus of rigidity 84 kN/mm², find the axial load which the spring can carry and the deflection per active turn in case of: i) Neglecting the effect of curvature. ii) Considering the effect of curvature.	CO2	8 Marks

(OR)

8	a)	What is nipping in a leaf spring? Discuss its role. List the materials commonly used for the manufacture of leaf springs.	CO1	5 Marks
	b)	A truck spring has 12 number of leaves, two of which are full length leaves. The spring supports are 1.05 m apart and the central band is 85 mm wide. The central load is to be 5.4 kN with a permissible stress of 280 MPa. Determine the thickness and width of the steel spring leaves. The ratio of the total depth to the width of the spring is 3. Also determine the deflection of the spring.	CO3	9 Marks

UNIT-V

9		Design a cast iron piston for a single acting four stroke engine for the following data : Cylinder bore = 100 mm; Stroke = 125 mm; Maximum gas pressure = 5 N/mm²; Indicated mean effective pressure = 0.75 N/mm²; Mechanical efficiency = 80%; Fuel consumption = 0.15 kg per brake power per hour; Higher calorific value of fuel = 42 x 10^3 kJ/kg; Speed=2000 r.p.m; Any other data required for the design may be assumed.	CO5	14 Marks

(OR)

10	a)	Derive the expression for the ratio of driving tensions for flat belt drive.	CO1	7 Marks
	b)	Design a rubber belt to drive a dynamo generating 20 kW at 2250 r.p.m and fitted with a pulley 200mm diameter. Assume dynamo efficiency to be 85%. Take Allowable stress for belt = 2.1 MPa; Density of rubber = 1000 kg/m³; Angle of contact for dynamo pulley = 165° and coefficient of friction between belt and pulley = 0.3	CO3	7 Marks

❀ ❀ ❀

CODE No.: 16BT50302 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

INDUSTRIAL ENGINEERING AND MANAGEMENT
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks

UNIT-I

1		Explain about functions of management.	CO1	14 Marks
		(OR)		
2		What is Corporate Social Responsibility (CSR)? Explain it briefly.	CO2	14 Marks

UNIT-II

3		Describe the different types of plant layout.	CO2	14 Marks
		(OR)		
4		Discuss the parallel and series-parallel device configurations in detail.	CO2	14 Marks

UNIT-III

5		Define productivity. Explain about the objectives of work study.	CO3	14 Marks
		(OR)		
6		Explain about different steps involved in work sampling.	CO1	14 Marks

UNIT-IV

7		The demand for an item is 12,000 units per year and shortage are allowed. If the unit cost is Rs.15 and the holding cost is Rs.20 per year per unit, determine the optimum total yearly cost. The cost of placing one order is Rs.6,000 and the cost of one shortage is Rs.100 per year.	CO3	14 Marks
		(OR)		
8		Discuss about different functions and types of inventory.	CO4	14 Marks

UNIT-V

9		Define Quality Control. Describe the control charts for attributes in detail.	CO5	14 Marks
		(OR)		
10	a)	What is Total Quality Control? Explain it briefly.	CO5	7 Marks
	b)	Define Industrial Safety. Explain about Industrial Disputes Act in detail.	CO6	7 Marks

CODE No.: 16BT50303 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC16) Supplementary Examinations January – 2022

METROLOGY AND MEASUREMENTS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) What are the various possible sources of errors in measurements? What do you understand by systematic errors and random errors? How the random errors are analyzed? CO1 6 Marks

b) The slip gauge set M 38 consists of the following: CO2 8 Marks

Range	Steps	Pieces
1.005	----	1
1.01-1.09	0.01	9
1.1-1.9	0.1	9
1.0-9.0	1.0	9
10.0-100.0	10.0	10

Choose the suitable slip gauges to give the following dimensions:

i) 29.975 mm. ii) 16.07 mm. iii) 101.005 mm.

(OR)

2 a) Explain with neat sketch, the basic hole system and unilateral tolerance. Discuss their suitability in comparison to other systems. CO1 6 Marks

b) In a hole and shaft combination of 25 mm nominal size, CO3 8 Marks

H7 hole limit are + 0.021 mm, + 0.000 mm

e8 shaft limits are - 0.040 mm, - 0.073 mm

State the values of

i) maximum and minimum clearance obtainable.
ii) allowance.
iii) tolerance on the hole and the shaft.
iv) type of fit.

UNIT-II

3 a) What is limit gauging? Sketch different limit gauges used in industry. CO1 6 Marks

b) Describe various salient features of a comparator and how are they achieved in the Sigma Comparator? Explain your answer with sketches. CO5 8 Marks

(OR)

4 a) Select the sizes of angle gauges needed to build the following angles: 22^{0}, $11^{0}20^{I}$, $29^{0}\,54^{I}$, $31^{0}\,49^{I}24^{II}$. CO3 4 Marks

b) Discuss with suitable sketches, the method for testing straightness using spirit level. CO5 4 Marks

c) State the requirements for accuracy in the construction of sine bar. Why the use of a sine bar is not recommended for angles larger than 45^{0} with the reference plane? CO2 6 Marks

UNIT-III

5	a)	Explain with a neat sketch the principle and construction of an auto collimator.	CO1	8 Marks
	b)	What is the difficulty in using the optical flat alone? How do you overcome this difficulty in an interferometer?	CO4	6 Marks

(OR)

6	a)	Describe various methods of numerical assessment of surface finish.	CO1	6 Marks
	b)	The heights of peaks and valleys of 20 successive points on a surface are 35, 25, 40, 22, 37, 19, 41, 21, 42, 18, 42, 24, 44, 25, 40, 18, 40, 18, 39, and 21 microns respectively, measured over a length 20mm. Determine CLA and RMS values of roughness surface.	CO3	8 Marks

UNIT-IV

7	a)	With a neat sketch, explain how the simple effective diameter of a screw thread may be checked using the two wire method.	CO1	6 Marks
	b)	What is 'best size of wire' for effective diameter measurement? Derive a relationship for the best size wire in terms of its effective diameter.	CO3	4 Marks
	c)	Describe a gear tooth Vernier and indicate how the tooth thickness is checked with this instrument.	CO4	4 Marks

(OR)

8	a)	What are the various types of pitch errors on thread components and what is the difference between them? State the causes of each of them. How these errors effect the effective diameter of screw thread?	CO2	8 Marks
	b)	How will you proceed to check the thread angle of a screw thread? Also explain the purpose of profile thread gauge.	CO5	6 Marks

UNIT-V

9	a)	Define gauge factor. Also explain the usage of resistance strain gauge for bending.	CO1	6 Marks
	b)	Explain the following. i) Explain various methods applied for measurement of stresses and strains. ii) Explain various methods applied for measurement of torque.	CO5	8 Marks

(OR)

10	a)	Explain the following. i) Thermo couples. ii) Electrical resistance sensors.	CO1	6 Marks
	b)	What are the methods to be followed for standards and calibration of measurement of pressure in the industry?	CO1	4 Marks
	c)	Describe a method to be applied for measuring pressure with a suitable sketch.	CO1	4 Marks

CODE No.: 16BT50304 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

REFRIGERATION AND AIR-CONDITIONING
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define the following terms. i) COP of Refrigerator. ii) COP of Heat Engine. iii) COP of Heat Pump.	CO1	7 Marks
	b)	Derive an expression for COP of Bell Coleman air refrigeration cycle.	CO1	7 Marks
		(OR)		
2	a)	Discuss the working principle of bootstrap air cooling system.	CO1	7 Marks
	b)	A reversed carnot cycle delivers 60 x 10^3kJ/min to a conditioned space when used as heat pump. If the space is maintained at 25°C when the ambient temperature is 10°C, Determine: i) Amount of heat drawn from the surrounding and power required to run the heat pump. ii) If the required heat is supplied by electric heaters, determine the power consumed.	CO2	7 Marks

UNIT-II

3	a)	Discuss the effect of super heating and sub cooling on performance of VCR.	CO3	7 Marks
	b)	An ammonia refrigerator works between 2.077 bar and 12.37 bar, the vapor being dry at the end of the isentropic compression. There is no under cooling of liquid ammonia, and the liquid is expanded through a throttle valve after leaving the condenser. Calculate power per ton of Refrigeration and COP. Assume c_p for vapor as 0.52 kJ / kg° K.	CO3	7 Marks

Pressure, Bar	Saturation temperature, °C	Enthalpy, kJ/kg		Entropy, kJ/kg K	
		Liquid	Vapour	Liquid	Vapour
2.077	-18	117.3	1440.4	0.6884	5.8739
12.37	32	352.2	1487.1	1.52	5.24

(OR)

4	a)	Which refrigerants require centrifugal compressors? Where these refrigerants are in practice? Give five examples.	CO2	7 Marks
	b)	What are the advantages and disadvantages of using air as refrigerant compared to F_{-12} and NH_3.	CO3	7 Marks

UNIT-III

5	a)	Discuss the advantages of vapour absorption refrigeration system over vapour compression refrigeration system.	CO3	7 Marks
	b)	In a vapour absorption refrigeration system, heating, cooling and refrigeration takes place at the temperatures of 100°C, 20°C and -5°C respectively. Find the maximum C.O.P of the system.	CO4	7 Marks
		(OR)		
6	a)	Discuss the working principle of steam jet refrigeration system	CO3	7 Marks
	b)	What is the principle and operation of thermo electric refrigerator?	CO3	7 Marks

UNIT-IV

7	a)	Define the following psychometric properties. i) Relative humidity. ii) Specific humidity. iii) Dew point Temperature.	CO5	7 Marks
	b)	Describe the winter air conditioning system with neat sketch.	CO6	7 Marks
		(OR)		
8	a)	Define the following terms. i) Room sensible heat factor. ii) Grand sensible heat factor. iii) Effective room sensible heat factor.	CO3	7 Marks
	b)	What are the different factors which must be considered evaluating cooling load? What are the different means by which this load can be reduced?	CO4	7 Marks

UNIT-V

9	a)	Define the human comfort and explain the factors which affect human comfort.	CO6	7 Marks
	b)	Define the term Effective Temperature and explain its importance in air-conditioning system. Describe the factors which affect Effective Temperature.	CO6	7 Marks
		(OR)		
10	a)	Explain in detail, the filters used in air conditioning system.	CO3	7 Marks
	b)	Explain the use of heat pump for heating and cooling cycle with a neat diagram.	CO6	7 Marks

CODE No.: 16BT50305 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

THERMAL ENGINEERING-II
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	A simple ideal Rankine cycle with water as working fluid operates between the pressure limits of 17.5 Mpa in the Boiler and 30 kPa in the condenser. What is the minimum temperature required at the turbine inlet such that the quality of the steam leaving the turbine is not below 80%. When operated at this temperature, determine the cycle efficiency of the cycle?	CO1	7 Marks
	b)	A Rankine cycle operates between pressures of 80 bar and 0.1 bar. The maximum temperature of the cycle is 600^0C. If the steam turbine and pump efficiencies are 90% and 80 % respectively, sketch the cycle on T-s diagram and calculate the net work and efficiency of the cycle.	CO1	7 Marks

(OR)

2	a)	Differentiate between Water tube and Fire tube boilers with proper examples.	CO1	7 Marks
	b)	Briefly explain the working of Babcock and Wilcox boiler with a neat sketch.	CO2	7 Marks

UNIT-II

3	a)	Write a short note on boiler horse power, equivalent evaporation and boiler efficiency.	CO1	7 Marks
	b)	Derive equation for condition of maximum discharge through a chimney.	CO3	7 Marks

(OR)

4	a)	Explain induced draught and forced draught.	CO1	7 Marks
	b)	How much air used per kg of coal burnt in a boiler having chimney of 32.3m height to create a draught of 19mm of water column when the temperature of flue gaeses in the chimney is 370^0C and the temperature of boiler house is 30^0C?	CO4	7 Marks

UNIT-III

5	a)	Write the effect of friction on flow through steam nozzle.	CO1	7 Marks
	b)	Determine the throat area, exit area and exit velocity for a steam nozzle to pass a mass flow of 0.2kg/sec when inlet conditions are 10bar and 250°c and the final pressure is 2bar. Assume expansion is isentropic and that the inlet velocity is negligible use $\mathbf{pv^{1.3}}$=const.	CO2	7 Marks

(OR)

6	a)	A simple impulse turbine, the nozzles are inclined at 22^0 with the direction of motion of the moving blades. The steam leaves the nozzles at 375 m/s. The blade speed is 165 m/s. Find suitable inlet and outlet angles for the blades in order that the axial thrust is zero. The relative velocity of steam as it flows over the blades is reduced by 15 % due to friction. Determine also the power developed for a flow rate of 10 kg/s.	CO1	7 Marks
	b)	What is diagram efficiency and derive the condition for maximum diagram efficiency of impulse turbine?	CO5	7 Marks

UNIT-IV

7	a)	In a reaction stage of a steam turbine, the nozzle angle is 20^0 and the absolute velocity of steam at inlet to the moving blades is 240 m/s. The blade velocity is 210 m/s. If the blades are designed for 50% reaction, determine: i) The blade angle at inlet and exit. ii) The enthalpy drop per unit mass of steam in the moving blades and in the complete stage . iii) The diagram power for a steam flow of 1 kg/s. iv) The diagram efficiency.	CO2	7 Marks
	b)	What is 50% Reaction turbine? What are the Characteristics of 50% reaction turbine?	CO1	7 Marks

(OR)

8	a)	Explain the effects of Air leakage in a condenser.	CO1	7 Marks
	b)	Illustrate the working of a parallel flow jet condenser with the help of a neat sketch.	CO2	7 Marks

UNIT-V

9	a)	The Pressure ratio of an open cycle gas turbine power plant is 5.6 and 1 bar. The compression is carried out in two stages with perfect inter cooling in between. The maximum temperature of the cycle is limited to 700^0C. Assuming the isentropic efficiency of each stage compressor is 85% and Turbine is 95%, Determine the power developed and efficiency of the power plant, if the air flow is 1.2kg/sec. Mass of the fuel may be neglected, and may be assumed that Cp=1.02kJ/kg K and gamma =1.41.	CO1	7 Marks
	b)	Explain the gas turbine power plant with inter cooling with PV and TS diagrams.	CO2	7 Marks

(OR)

10	a)	Discuss the working principle of turbo prop Engine	CO2	7 Marks
	b)	Discuss the working principle of Rocket Engine.	CO2	7 Marks

CODE No.: 16BT50308 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

MECHATRONICS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks

UNIT-I

1	a)	What is a Mechatronics system? List the elements of Mechatronics system.	CO1	6 Marks
	b)	Synthesis about the Control systems with an example.	CO1	8 Marks
		(OR)		
2		Evaluate the Automatic control systems with an example and discuss its advantages and disadvantages.	CO1	14 Marks

UNIT-II

3	a)	Discuss the functional operation of following Electric actuators. i) Stepper motors. ii) Relays.	CO2	8 Marks
	b)	Explain operational performance of LVDT with a neat sketch.	CO2	6 Marks
		(OR)		
4	a)	Discuss the operational performance of following sensors. i) Resistance Temperature Detectors (RTD). ii) Piezoelectric accelerometers.	CO2	8 Marks
	b)	Demonstrate the operation of Rotary actuators with neat sketches.	CO2	6 Marks

UNIT-III

5	a)	Describe about the Analogue-to-Digital converter with a neat sketch.	CO3	7 Marks
	b)	What is Amplification? Explain any one operation amplifier with neat sketch.	CO2	7 Marks
		(OR)		
6	a)	Explain the following. i) Current-Voltage converters. ii) Bridge circuits.	CO3	8 Marks
	b)	Describe the Nyquist sampling theorem.	CO3	6 Marks

UNIT-IV

7	a)	Explain about Proportional-Integral-Derivative (PID) controller with a neat sketch.	CO4	9 Marks
	b)	Discuss the methodology in the process of selection of controllers.	CO4	5 Marks
		(OR)		
8	a)	Explain about Proportional Integral (PI) controller with a neat sketch.	CO4	8 Marks
	b)	What is the controller tuning? Explain.	CO4	6 Marks

UNIT-V

9	a)	Develop a case study on Automobile engine management system.	CO5	9 Marks
	b)	Write a short note on Ethics as design constraint.	CO6	5 Marks
		(OR)		
10		Develop a case study on Pick-and-place robot with a neat sketch.	CO5	14 Marks

CODE No.: 16BT50401 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

DIGITAL COMMUNICATIONS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Illustrate the differential pulse code modulation digital waveform technique with neat sketches.	CO1	7 Marks
	b)	Draw the block diagram of delta modulation scheme and explain. Mention its advantages and disadvantages.	CO1	7 Marks
		(OR)		
2	a)	How non-uniform quantization is done through companding and explains A-law and μ-law companding with characteristic curves.	CO1	7 Marks
	b)	Draw the block diagram of adaptive delta modulation transmitter and receiver and explain.	CO1	7 Marks

UNIT-II

3	a)	Derive the expression for output signal to noise ratio in PCM.	CO1	7 Marks
	b)	What is the quantization noise PCM? Explain the effect of thermal noise in PCM.	CO3	7 Marks
		(OR)		
4	a)	Derive an expression for output signal to noise ratio in DM.	CO1	7 Marks
	b)	What is the quantization noise DM? Explain the effect of thermal noise in PCM.	CO3	7 Marks

UNIT-III

5	a)	Explain about baseband shaping and correlative coding.	CO6	7 Marks
	b)	Derive an expression for probability of error of phase shift keying.	CO2	7 Marks
		(OR)		
6	a)	Derive an expression for probability of error of amplitude shift keying.	CO2	7 Marks
	b)	Explain the generation and detection of DPSK signal with necessary waveforms. Mention its advantages over binary phase shift keying.	CO2	7 Marks

UNIT-IV

7	a)	a) Calculate the entropy in bits for each of the following random variables: i) Pixel values in an image whose possible grey values are all the integers from 0 to 255 with uniform probability. ii) Humans grouped by whether they are, or are not, mammals. iii) Gender in a tri-sexual insect population whose three genders occur with probabilities1/4, 1/4, and 1/2. iv) A population of persons classified by whether they are older, or not older, than the population's median age.	CO1	8 Marks
	b)	A zero-memory source emits six messages with probabilities 0.3, 0.25, 0.15, 0.12, 0.1, 0.08. Find the 4-ary (quaternary) Huffman code. Determine its average word length, the efficiency, and the redundancy.	CO4	6 Marks
		(OR)		

8	a)	A zero-memory source emits messages m_1 and m_2 with probabilities 0.8 and 0.2 respectively. Find the optimum binary code for this source as well as for its second and third order extensions. Determine the code efficiencies in each case.	CO4	10 Marks
	b)	A communication channel with a bandwidth of 4 kHz has a signal power to noise ratio of 7. The bandwidth is reduced by 25 %. How much should the signal power be increased to maintain the same channel capacity?	CO3	4 Marks

UNIT-V

9	a)	Given a generator matrix G = [1 1 1], construct a (3, 1) code. How many errors can this code correct? Find the code word for data vectors d = 0 and d = 1. Comment.	CO5	6 Marks
	b)	Consider the following (k + 1, k) systematic linear block code with parity-check digit $\mathbf{c}_{k+1}$ given by $\mathbf{c}_{k+1} = d_1+d_2+\ldots\ldots\ldots+d_k$ i) Construct the appropriate generator matrix of this code. ii) Construct the code generated by this matrix for k =3. iii) Determine the error detecting or correcting capabilities of this code.	CO5	8 Marks

(OR)

10	a)	Compare the error probability of coded and uncoded systems under constraints of power and information rate.	CO5	7 Marks
	b)	Consider a (6, 2) code generated by the matrix $G = \begin{bmatrix} 1 & 0 & 1 & 1 & 1 & 0 \\ 0 & 1 & 1 & 0 & 1 & 1 \end{bmatrix}$. Construct the code table for this code and determine the minimum distance between code words	CO5	7 Marks

CODE No.: 16BT50402 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

MICROPROCESSORS AND MICROCONTROLLERS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks

		UNIT-I		
1	a)	Describe the architecture and operation 8086.	CO1	8 Marks
	b)	What is NEAR CALL and FAR CALL procedure statement in 8086? Explain how stack is used in these two.	CO5	6 Marks
		(OR)		
2	a)	Write an ALP in 8086 to add 16 digit packed BCD numbers and store the result as BCD number.	CO4	7 Marks
	b)	Illustrate any five Assembler directives.	CO1	7 Marks
		UNIT-II		
3	a)	Compare maximum mode and minimum mode of 8086.	CO2	5 Marks
	b)	Design an interfacing system to connect 8Kb static RAM with the microprocessor 8088 in the minimum mode configuration from address 42000h.	CO3	9 Marks
		(OR)		
4	a)	Explain the interrupt response sequence of 8086 with neat diagram.	CO1	6 Marks
	b)	Draw the timing diagrams for READ and WRITE operations of 8086 microprocessor and explain.	CO2	8 Marks
		UNIT-III		
5	a)	Illustrate the different modes of operation of 8255.	CO1	9 Marks
	b)	Write an ALP for 8086 to generate a square wave of 1 MHz frequency using 8255.	CO4	5 Marks
		(OR)		
6	a)	Differentiate synchronous and asynchronous mode of data transfer.	CO2	6 Marks
	b)	Describe transmitter and receiver section of 8251.	CO1	8 Marks
		UNIT-IV		
7	a)	With neat sketch, explain the architecture of 8051.	CO1	9 Marks
	b)	Explain Program Status Word register functionality of 8051.	CO1	5 Marks
		(OR)		
8	a)	Write an ALP for 8051 to find Least Common Multiple (LCM) and Greatest Common Devisor (GCD) of given two numbers.	CO6	9 Marks
	b)	Describe Read Modify and Write instructions of 8051.	CO1	5 Marks
		UNIT-V		
9	a)	Explain the operation of timer in 8051.	CO2	7 Marks
	b)	Write an ALP for 8051 to generate 1 KHz square wave on Port Pin P3.1.	CO6	7 Marks
		(OR)		
10	a)	Write an ALP Program to transfer data with baud rate of 4800 from 8051 to PC.	CO5	7 Marks
	b)	Write a short note on interrupts of 8051.	CO1	7 Marks

CODE No.: 16BT50403 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

VLSI DESIGN

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Derive the relation between $I_{ds} - V_{ds}$ in saturation region.	CO2	7 Marks
	b)	Explain NMOS Inverter with the help of transfer characteristics.	CO3	7 Marks
		(OR)		
2	a)	Explain about threshold voltage (V_t) and the influence of body effect on threshold voltage.	CO2	7 Marks
	b)	With neat sketches, explain Lithography process in IC fabrication.	CO4	7 Marks

UNIT-II

3	a)	Draw the schematic and stick diagram of NMOS NOR gate.	CO5	7 Marks
	b)	Explain how the problem of driving large capacitive is solves.	CO4	7 Marks
		(OR)		
4	a)	Draw the λ-based design rules for contacts.	CO2	8 Marks
	b)	Calculate Ron resistance of CMOS inverter.	CO3	6 Marks

UNIT-III

5	a)	Explain the construction of 4-bit carry-lookahead adder.	CO6	8 Marks
	b)	How two binary numbers are compared using comparator and explain with its structure?	CO1	6 Marks
		(OR)		
6	a)	Explain construction of carry-select adder.	CO2	7 Marks
	b)	Illustrate the steps involved in booth multiplier with example.	CO3	7 Marks

UNIT-IV

7	a)	Draw the schematic of ripple-carry binary counter and explain its operation.	CO4	8 Marks
	b)	Explain about EPROM and EEPROM based programming technology.	CO1	6 Marks
		(OR)		
8	a)	Draw and explain the anti-fusebased programmable interconnect.	CO3	7 Marks
	b)	Draw and explain the working of dynamic and static memory cell.	CO1	7 Marks

UNIT-V

9	a)	What are the basic principles of low-power design?	CO2	7 Marks
	b)	What is the need for testing?	CO3	7 Marks
		(OR)		
10		Write short notes on: i) CMOS testing. ii) Design strategies of test.	CO4	14 Marks

CODE No.: 16BT50501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

COMPUTER NETWORKS

[Electronics and Communication Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Describe the importance of Layered architecture.	CO1	7 Marks
	b)	Write short notes on guided medium.	CO2	7 Marks
		(OR)		
2	a)	Explain the functionality of OSI layers in detail.	CO1	10 Marks
	b)	Describe the merits of TCP / IP protocol suite over OSI model.	CO1	4 Marks

UNIT-II

3	a)	Explain the design issues of data link layer.	CO2	7 Marks
	b)	Explain about Sliding window protocol.	CO3	7 Marks
		(OR)		
4		A bit stream 110110110 is transmitted using standard CRC method. The $G(x)$ is $x^4 + x^2 + x + 1$. Prove that there are no transmission errors.	CO4	14 Marks

UNIT-III

5	a)	Explain the importance of routing and find the shortest path using distance vector algorithm with an example.	CO4	7 Marks
	b)	Define congestion. Explain different congestion control algorithms.	CO4	7 Marks
		(OR)		
6	a)	How optimality principle achieved in Shortest path routing?	CO4	7 Marks
	b)	Differentiate IP v4 and IP v6.	CO3	7 Marks

UNIT-IV

7	a)	Explain the service primitives of transport layer.	CO1	7 Marks
	b)	Explain the connection establishment in transport layer.	CO2	7 Marks
		(OR)		
8	a)	Describe the transmission policy of transport layer.	CO2	7 Marks
	b)	Describe the format of TCP segment.	CO1	7 Marks

UNIT-V

9		Write short notes on following. i) DNS. ii) SNMP. iii) WWW architecture.	CO1	14 Marks
		(OR)		
10	a)	Define E-mail. Explain about architecture.	CO1	7 Marks
	b)	Explain about Hypertext protocol.	CO1	7 Marks

CODE No.: 16BT50502 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC16) Supplementary Examinations January – 2022

LINUX PROGRAMMING
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks

		UNIT-I		
1	a)	What is GNU? List the various major examples of software from the GNU Project.	CO5	7 Marks
	b)	How to pass arguments to Linux programs? Explain with example.	CO2	7 Marks
		(OR)		
2	a)	What is Environment Variables? Explain the functions getenv() and putenv() with example.	CO1	7 Marks
	b)	Describe difference between localtime and gmtime. Write a program to print raw time and gmtime.	CO2	7 Marks
		UNIT-II		
3	a)	What is Shell? Describe the necessity of shell programming.	CO2	7 Marks
	b)	Write Shell script to find whether an input number is palindrome or not.	CO3	7 Marks
		(OR)		
4	a)	Describe various control structure in shell programming with suitable example.	CO1	10 Marks
	b)	Write the difference between break and continue.	CO1	4 Marks
		UNIT-III		
5	a)	Define file. Describe the structure of File System in Linux.	CO1	7 Marks
	b)	Describe the various formatted input and output commands with example.	CO2	7 Marks
		(OR)		
6	a)	Write a shell script to read source file and copy it to target file.	CO5	7 Marks
	b)	List various low level functions used to access the device drivers and explain.	CO1	7 Marks
		UNIT-IV		
7	a)	How to create new process? Illustrate the working principle of Parent and child process using fork command.	CO5	8 Marks
	b)	What is a process? Describe process structure and process table.	CO1	6 Marks
		(OR)		
8	a)	What is Zombie process? Explain Zombie process with an example.	CO1	6 Marks
	b)	What is signal? Describe the various types of signals names defined in signal.h	CO1	8 Marks
		UNIT-V		
9	a)	What is Inter process communication? Describe implementation of popen call with an example.	CO2	7 Marks
	b)	Define Named pipes and explain difference between pipes and names pipes with an example.	CO2	7 Marks
		(OR)		
10	a)	What is socket? Explain the attributes and various types of sockets.	CO1	7 Marks
	b)	Describe the process of naming socket, creating a socket and accepting connections.	CO4	7 Marks

❀ ❀ ❀

CODE No.: 16BT50503 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

COMPUTER VISION
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Describe image formation with Pin Hole perspective and weak perspective.	CO1	9 Marks
	b)	Analyze different cameras with lenses by an example.	CO2	5 Marks
		(OR)		
2	a)	Explain the reflection at surfaces for modeling pixel brightness.	CO1	10 Marks
	b)	List any 4 applications of human color perception.	CO2	4 Marks

UNIT-II

3	a)	Investigate pooled texture filters. How they are used for generating different discovering textons?	CO2	7 Marks
	b)	Discuss about texture of an image.	CO1	7 Marks
		(OR)		
4	a)	Write a note on Image denoising shape from texture.	CO2	9 Marks
	b)	List the advantages and disadvantages of Binocular reconstruction.	CO2	5 Marks

UNIT-III

5	a)	Analyze the properties of grouping and gestalt theory.	CO3	7 Marks
	b)	Explain the concepts of image segmentation based on clustering pixels.	CO3	7 Marks
		(OR)		
6	a)	Explain agglomerative clustering with a graph by normalized cuts concept.	CO1	7 Marks
	b)	Give in detail mean shift to find local modes for any sample data.	CO3	7 Marks

UNIT-IV

7		Elucidate In how many ways errors and loss can be classified using loss to determine decisions.	CO3	14 Marks
		(OR)		
8		Discuss the composition of regularization and error rate in the classification and detection of objects.	CO3	14 Marks

UNIT-V

9	a)	What is categorization and provide in detail about it?	CO1	9 Marks
	b)	Describe the purpose of basic technology on smoothing word counts.	CO2	5 Marks
		(OR)		
10		Demonstrate different types of information retrieval with their applications	CO1	14 Marks

CODE No.: 16BT50504 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

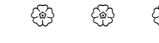
III B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

DATA COMMUNICATIONS
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks

		UNIT-I		
1	a)	A. Mention some standard organizations for Data Communications highlighting their roles and responsibilities.	CO1	6 Marks
	b)	Sketch the binary ASK, FSK, PSK and QPSK waveforms for the sequence 101100111.	CO2	8 Marks
		(OR)		
2	a)	Justify the need for a topology in data communications and Compare the different topologies used.	CO1	8 Marks
	b)	With a sketch, explain the general block diagram of Data Communications circuit. Compare Serial and Parallel data transmission.	CO1	6 Marks
		UNIT-II		
3		Why Multiplexing is required in Communications? List the ways through multiplexing can be carried out. Explain briefly about T Carrier Systems.	CO3	14 Marks
		(OR)		
4	a)	With a block diagram, explain PCM in detail.	CO2	8 Marks
	b)	Explain Digital Companding in detail.	CO1	6 Marks
		UNIT-III		
5	a)	List and explain the optical properties of Radio Waves.	CO1	8 Marks
	b)	Define Crosstalk and explain the three types of crosstalk that impacts communication.	CO1	6 Marks
		(OR)		
6	a)	What are the steps involved in completing a local telephone call.	CO1	7 Marks
	b)	Explain about the three modes of propagation of Electromagnetic waves within the Earth's atmosphere.	CO2	7 Marks
		UNIT-IV		
7	a)	Explain about Digital Cellular Telephone in detail.	CO3	8 Marks
	b)	Describe about POSTNET Code.	CO1	6 Marks
		(OR)		
8	a)	Explain the concepts of Dualization and Splitting with respect to Cellular Systems.	CO3	4 Marks
	b)	What is a bar code and when is it commonly used? Describe what is meant by discrete barcode, continuous barcode and 2D barcode.	CO1	10 Marks
		UNIT-V		
9	a)	List and describe the blocks of a voice band modem.	CO1	7 Marks
	b)	Define Modem Synchronization and explain about its functions.	CO1	7 Marks
		(OR)		
10	a)	Explain the terms bits per second (bps), baud, probability of error, bit error rate with an example each.	CO1	8 Marks
	b)	What is the purpose of Scrambler and Descrambler circuits?	CO1	6 Marks



CODE No.: 16BT51001 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

BIO-MEDICAL INSTRUMENTATION
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Discuss the significance of Resting and Action Potentials with sketches.	CO1	10 Marks
	b)	What are the advantages/disadvantages of Biochemical Transducers?	CO2	4 Marks
		(OR)		
2		Describe the propagation of action potentials between nerves to neuro-muscular junction.	CO2	14 Marks

UNIT-II

3		Explain the Einthoven Triangulation of ECG in detail.	CO2	14 Marks
		(OR)		
4	a)	Give any two methods for measuring the blood flow rate.	CO1	8 Marks
	b)	Explain the interpretation of the QRS Wave of the ECG.	CO3	6 Marks

UNIT-III

5		Explain the 10-20 electrode placement of EEG with a sketch.	CO3	14 Marks
		(OR)		
6		Describe the methodology used for analyzing the brain through EEG.	CO3	14 Marks

UNIT-IV

7	a)	Define pacemaker. Explain the need of the same in brief.	CO5	6 Marks
	b)	What are the types of pacemakers in use today?	CO5	8 Marks
		(OR)		
8	a)	Differentiate between internal and external pacemaker.	CO5	8 Marks
	b)	What is Synchronous Pacemaker? Explain briefly.	CO5	6 Marks

UNIT-V

9		Describe the principle of Ultrasonic Imaging using the Doppler Effect.	CO3	14 Marks
		(OR)		
10		Describe the block diagram of CT scanner with a sketch.	CO3	14 Marks

CODE No.: 16BT51003 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

PRINCIPLES OF COMMUNICATIONS

[Electrical and Electronics Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What is modulation? Why is modulation used in communication system?	CO1	7 Marks
	b)	What do you understand of modulation index? What is its significance?	CO1	7 Marks
		(OR)		
2	a)	Explain the generation of AM and Drive an expression for AM wave and sketch its frequency spectrum.	CO1	7 Marks
	b)	With a neat block diagram, explain the balanced modulator method of generation DSB-SC wave.	CO1	7 Marks

UNIT-II

3	a)	Derive an expression for an FM wave. Define Modulation Index, Maximum deviation and Bandwidth of FM Signal.	CO4	7 Marks
	b)	Describe with the help of block diagrams, schemes for Generating: i) FM using PM. ii) PM using FM.	CO5	7 Marks
		(OR)		
4	a)	Explain in detail the Demodulation of FM Using PLL.	CO1	7 Marks
	b)	Write short notes on Pre-emphasis and De-emphasis.	CO1	7 Marks

UNIT-III

5	a)	Write short notes on the following. i) Double polarity PAM. ii) Demodulation of PWM.	CO1	7 Marks
	b)	Explain the operation of Time Division Multiplexing with the help of neat sketches.	CO1	7 Marks
		(OR)		
6	a)	Explain the process of Generation & demodulation of PPM.	CO1	7 Marks
	b)	Write the comparisons among PAM, PWM and PPM.	CO1	7 Marks

UNIT-IV

7	a)	Explain the in detail about Sampling and Quantization of PCM with a neat diagram.	CO1	7 Marks
	b)	What is DM and explain the Noises in DM.	CO1	7 Marks
		(OR)		
8	a)	Explain About FSK and Coherent FSK.	CO1	7 Marks
	b)	Write about QPSK Modulation and Demodulation.	CO1	7 Marks

UNIT-V

9	a)	Apply Shannon-Fano coding procedure of M=2 and M=3. [x]=[x_1, x_2, x_3, x_4, x_5, x_6, x_7, x_8] with probability [P]=[1/4, 1/8, 1/16, 1/16, 1/4, 1/16, 1/8 ,1/16].	CO5	7 Marks
	b)	A DMS has symbols a, b, c with probabilities 0.65, 0.2, 0.15 respectively. i) Calculate the entropy of the source. ii) Calculate the entropy of second order extension of the source.	CO1	7 Marks

(OR)

10	a)	Write a short note on concept of amount of information and its properties.	CO5	7 Marks
	b)	Apply Huffmann's encoding procedure to the following message ensemble and determine the average length of the encoded message. {X} = {x_1, x_2, x_3, x_4, x_5, x_6, x_7, x_8, x_9, x_{10} } P{X} = {0.18, 0.17, 0.16, 0.15, 0.10, 0.08, 0.05, 0.05, 0.04, 0.02} The encoding alphabet is {D} = {0, 1, 2, 3}.	CO5	7 Marks

CODE No.: 16BT51201 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

COMPUTER GRAPHICS AND MULTIMEDIA
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain DDA algorithm to generate lines.	CO3	7 Marks
	b)	Explain raster scan display devices.	CO1	7 Marks
		(OR)		
2		Describe an algorithm for generating an ellipse.	CO3	14 Marks

UNIT-II

3	a)	Explain about 3-Basic transformations in detail.	CO1	7 Marks
	b)	Find the matrix transformation for rotating the triangle with vertices (7,2), (3,2) and (3,9). With 90 degrees keeping the vertex fixed.	CO4	7 Marks
		(OR)		
4	a)	Write short notes on windowing.	CO1	7 Marks
	b)	Describe the Cohen-Sutherland algorithm for line clipping.	CO3	7 Marks

UNIT-III

5	a)	Write short notes on B-Spline blending functions.	CO4	7 Marks
	b)	Write the properties of B-Spline curves.	CO4	7 Marks
		(OR)		
6		Explain depth buffer method for visible surface detection.	CO4	14 Marks

UNIT-IV

7		What are the various types of video compressions models? Explain.	CO2	14 Marks
		(OR)		
8		Explain Various Graphics and Image data types.	CO4	14 Marks

UNIT-V

9		Explain Arithmetic coding with the help of example.	CO5	14 Marks
		(OR)		
10		Explain Transform coding with the help of Block diagram.	CO2	14 Marks

CODE No.: 16BT51202 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

OBJECT ORIENTED ANALYSIS AND DESIGN
[Computer Science and Engineering, Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Explain in detail about the conceptual model of the unified modeling language.	CO2	8 Marks
	b)	Explain about software development modeling.	CO1	6 Marks
		(OR)		
2	a)	Explain how you model system architecture.	CO1	8Marks
	b)	Discuss Rules and common mechanisms in UML.	CO3	6 Marks
		UNIT-II		
3	a)	Write about modeling techniques for class diagram.	CO2	8 Marks
	b)	Discuss in detail about advanced relationships.	CO3	6 Marks
		(OR)		
4	a)	Discuss terms and concepts of class diagram.	CO2	8 Marks
	b)	Discuss about relationships.	CO2	6 Marks
		UNIT-III		
5	a)	Write common modeling techniques for class and object diagrams.	CO4	8 Marks
	b)	Draw a sequence diagram for "register a student in a school".	CO4	6 Marks
		(OR)		
6	a)	Write about terms and concepts of class and object diagrams.	CO5	8 Marks
	b)	What is use case diagram? Explain the architecture of "Railway Reservation System" using use case diagram.	CO4	6 Marks
		UNIT-IV		
7	a)	Explain in detail about modeling a time constraint.	CO2	8 Marks
	b)	Draw state chart diagram for "Railway Ticket Reservation".	CO4	6 Marks
		(OR)		
8	a)	Draw and explain deployment and component diagrams for "Library Management System"	CO3	8 Marks
	b)	Differentiate event and signals.	CO3	6 Marks
		UNIT-V		
9	a)	Draw use case and class diagram for Library applications.	CO6	8 Marks
	b)	Draw and explain component diagram for ATM.	CO6	6 Marks
		(OR)		
10	a)	Using an artifact diagram explain the unified library applications.	CO5	8 Marks
	b)	Draw and explain use case and state chart diagrams for railway Reservation System.	CO6	6 Marks

CODE No.: 16BT51203 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

WEB TECHNOLOGIES
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks

UNIT-I

1	a)	Why forms are useful in HTML? How to create them in HTML? Explain.	CO1	7 Marks
	b)	Explain the following HTML tags with suitable example. i) <script>. ii) <!DOCTYPE>. iii) <frameset>. iv) <style>.	CO1	7 Marks
		(OR)		
2	a)	Explain the features of a HTML5. Also explain the structure of HTML5 document.	CO1, CO2	7 Marks
	b)	Explain the following HTML tags with suitable example. i) <video>. ii) <meta>. iii) <fieldset>. iv) <canvas>.	CO1	7 Marks

UNIT-II

3	a)	Describe the Cascading Style Sheet (CSS) with an example use the Font Attributes and Text Attributes in the example.	CO2	7 Marks
	b)	What is function? Explain how parameters are passed to functions in JavaScript.	CO1	7 Marks
		(OR)		
4	a)	Define object. Explain how to use objects in java scripts.	CO1	6 Marks
	b)	What are Cascading style sheets? Explain different types of CSS.	CO2	8 Marks

UNIT-III

5	a)	What are the methods to access HTML elements and attributes in JQuery?	CO5	8 Marks
	b)	Write the advantages and limitations of AJAX.	CO5	6 Marks
		(OR)		
6		Develop a user registration webpage using the grid system in bootstrap.	CO5	14 Marks

UNIT-IV

7	a)	Describe all the ways of creating Arrays in PHP.	CO5	7 Marks
	b)	Demonstrate the implementation of object cloning in PHP.	CO1	7 Marks
		(OR)		
8	a)	Explain the concept of string interpolation in PHP.	CO5	7 Marks
	b)	Write a PHP program to find prime numbers up to ‘n’ numbers.	CO5	7 Marks

UNIT-V

9	a)	Develop a simple PHP web application for verifying user Authenticity using MYSQL.	CO1	7 Marks
	b)	What are the various ways by sending forms data to PHP page and explain each.	CO4	7 Marks
		(OR)		
10	a)	Define a prepared statement. Explain in detail with the suitable program.	CO1	5 Marks
	b)	What are the advantages of cookies and sessions? How Cookies and	CO4	9 Marks

sessions are handled in PHP?

CODE No.: 16BT51241 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

OBJECT ORIENTED PROGRAMMING
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Write short note on the following Object Oriented concepts. i) Encapsulation. ii) Dynamic binding.	CO1	6 Marks
	b)	Write a program to perform the following functions using classes, objects, constructors and destructors wherever necessary. i) Read 5 subjects marks of 5 students. ii) Calculate the total and print the result on the screen.	CO1	8 Marks
		(OR)		
2	a)	Write a java program to implement a binary search procedure to find whether the given element is present in the array or not using objects and classes.	CO1	8 Marks
	b)	Explain the concept of passing the arguments by call by value and call by reference with an example.	CO1	6 Marks

UNIT-II

3	a)	Explain different uses of this keyword in java.	CO1, CO2	6 Marks
	b)	Explain creating packages and accessing a package with examples.	CO1	8 Marks
		(OR)		
4	a)	Write a Java program to find the area and perimeter of square and circle using interface.	CO1, CO2	8 Marks
	b)	What is nested interface? Explain it with an example.	CO1	6 Marks

UNIT-III

5	a)	Explain Arithmetic and NullPointer exception with the help of an example.	CO1	8 Marks
	b)	Explain the flow of control in try-catch-finally blocks with example.	CO1	6 Marks
		(OR)		
6	a)	"Does Java support thread priorities?" Justify your answer with suitable discussion.	CO2	6 Marks
	b)	Describe the need of thread synchronization. How is it achieved in Java programming? Explain with a suitable program.	CO2	8 Marks

UNIT-IV

7	a)	Explain the methods of LinkedList and HashSet class.	CO5	6 Marks
	b)	Write a Java program to create student registration form.	CO6	8 Marks
		(OR)		
8	a)	Write a Java program for calculator operations using AWT Controls	CO4	8 Marks
	b)	Write a Java program to illustrate the use of Flow Layout Manager.	CO4	6 Marks

UNIT-V

9	a)	Write a java program to handle keyboard events.	CO2, CO4	6 Marks
	b)	Write a java program to demonstrate the functionality of adapter class.	CO5	8 Marks
		(OR)		
10	a)	Explain the interfaces and classes in javax**.**servlet package.	CO5	8 Marks
	b)	Write a servlet which displays current system date and time	CO5	6 Marks

CODE No.: 16BT51501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC16) Supplementary Examinations January – 2022

COMPILER DESIGN

[Information Technology, Computer Science and System Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks

UNIT-I

1	a)	What is the difference between a phase and a pass? Which pass compiler I suitable for which machines? Explain.	CO1	6 Marks
	b)	What is the role of Lexical analyzer? Describe the input buffering mechanism in lexical analysis.	CO1	8 Marks
		(OR)		
2	a)	Explain the need for grouping the phases of compiler. Describe various compiler Construction tools.	CO5	7 Marks
	b)	Explain the Language for specifying Lexical Analyzer.	CO1	7 Marks

UNIT-II

3	a)	What are the difficulties with Top-Down parsing? How to overcome these difficulties?	CO3	7 Marks
	b)	Construct Predictive parsing table for the grammar E → E+T | T T → T * F | F F → (E) | id and parse the string id+id*id.	CO3	7 Marks
		(OR)		
4	a)	What are the advantages of LR parsing?	CO3	6 Marks
	b)	Construct CLR parsing table for the grammar S → L=R S → R L → *R L→ id R → L	CO3	8 Marks

UNIT-III

5	a)	Differentiate between S-Attributed and L-Attributed definitions.	CO4	6 Marks
	b)	Define syntax trees. How to construct a syntax tree? Describe.	CO4	8 Marks
		(OR)		
6	a)	Describe the rules for type checking.	CO4	6 Marks
	b)	What is a type expression? Explain the equivalence of type expressions with an appropriate example.	CO4	8 Marks

UNIT-IV

7	a)	Write the Syntax Directed Translation for Boolean expressions with Control flow representation.	CO4	7 Marks
	b)	What are the different kinds of storage allocation strategies? Explain.	CO6	7 Marks
		(OR)		
8	a)	What are the different kinds of operations that can be performed on a Symbol table?	CO6	6 Marks
	b)	What are the different storage allocation strategies? Explain the usage of Simple Stack Allocation Scheme.	CO6	8 Marks

UNIT-V

9	a)	What are the principle sources of optimization? Explain.	CO2	8 Marks
	b)	Write a note on optimization of Basic Block.	CO2	6 Marks
		(OR)		
10	a)	What are the issues in generating Machine code? Describe.	CO2	7 Marks
	b)	Write a brief note on peephole optimization.	CO2	7 Marks

CODE No.: 16BT51502 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

SYSTEMS SOFTWARE
[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain internal and external commands in UNIX with examples.	CO1	7 Marks
	b)	With suitable examples, illustrate mkdir, more, cmp and diff commands with all the options.	CO1	7 Marks
		(OR)		
2	a)	List the different categories of files in UNIX. Explain.	CO1	7 Marks
	b)	Discuss the role of kernel in UNIX architecture.	CO1	7 Marks

UNIT-II

3	a)	Write a 'C' program to adjust the position of file I/O.	CO2	7 Marks
	b)	Give a brief note on 'stat' and 'fstat' system calls in UNIX.	CO2	7 Marks
		(OR)		
4	a)	Describe an algorithm for process termination.	CO4	7 Marks
	b)	Write a 'C' program for reading and writing a pipe.	CO2	7 Marks

UNIT-III

5		Define Context of a process. Explain briefly the components of user context, register context and system- level context with a neat diagram.	CO4	14 Marks
		(OR)		
6	a)	Write an algorithm for 'wakeup' system call.	CO3	7 Marks
	b)	Describe the steps executed by kernel to make a process sleeping on an event.	CO3	7 Marks

UNIT-IV

7	a)	Write the steps in checking and handling signals in the context of a process.	CO5	7 Marks
	b)	Give the syntax of wait system call. Explain with an example program.	CO3	7 Marks
		(OR)		
8	a)	How many user IDs will kernel associate with each process? Explain the significance of each user ID with the associated system call.	CO3	7 Marks
	b)	Explain the algorithm for booting the system and Init process.	CO3	7 Marks

UNIT-V

9	a)	Explain IP addressing scheme in networking.	CO2	7 Marks
	b)	Explain how file transfer protocol will be used to transfer files.	CO3	7 Marks
		(OR)		
10	a)	What are the standard file systems in UNIX? Explain.	CO2	7 Marks
	b)	Briefly explain mounting and unmounting file systems in UNIX.	CO3	7 Marks

CODE No.: 16BT60402 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations January - 2022

DIGITAL SIGNAL PROCESSING
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define various elementary discrete time signals. Write notes on them and explain about their properties.	CO4	7 Marks
	b)	Explain frequency analysis of periodic discrete time signal using Fourier series method.	CO2	7 Marks
		(OR)		
2	a)	Define causality and stability of an LTI system and state the conditions for stability.	CO2	7 Marks
	b)	For the following discrete time signals, determine whether or not the system is linear, shift invariant, causal and stable. i) $y(n)=x(n+7)$. ii) $y(n)= x^3(n)$.	CO4	7 Marks

UNIT-II

3	a)	Perform circular convolution of the following sequences. $x_1(n)=\{1,2,3,4\}$ a $x_2(n)=\{1,1,2,1\}$	CO2	7 Marks
	b)	Find the DFT of the send quence $x(n)=\{1, 2, 3, 4, 4, 3, 2, 1\}$ using DIT-FFT algorithm.	CO1	7 Marks
		(OR)		
4	a)	Draw the radix 2 DIF-FFT structure when N=16.	CO1	7 Marks
	b)	State and prove convolution property of DFT in frequency domain.	CO2	7 Marks

UNIT-III

5	a)	For the given analog transfer function $H_a(s) = 3/(s+1)(s+4)$, determine H(z) for T=1sec using impulse invariant method.	CO5	7 Marks
	b)	Derive an expression for order of the Butterwort analog proto type filter.	CO2	7 Marks
		(OR)		
6	a)	Design IIR digital Butterworth low pass filter to satisfy the constraints $0.707 \le \lvert H(\omega) \rvert \le 1$; for $0 \le \omega \le 0.2\pi$ $\lvert H(\omega) \rvert \le 0.1$; for $0.5\pi \le \omega \le \pi$ Use Impulse invariant transformation with T=1 sec.	CO5	7 Marks
	b)	Discuss about different methods of realization of IIR systems.	CO2	7 Marks

UNIT-IV

7	a)	Compare an FIR filter with IIR filter. What conditions are to be satisfied by the impulse response of an FIR filter in order to have a linear phase?	CO2	7 Marks
	b)	Design a Linear phase low pass FIR filter with a cutoff frequency of $\pi/2$ rad/sec frequency sampling technique. Take N=11.	CO3	7 Marks
		(OR)		

8	a)	Analyse the characteristics of rectangular, Bartlet and Blackman windows with neat sketch.	CO3	6 Marks
	b)	Explain the realization of cascade and Linear phase structure of an FIR system.	CO3	8 Marks

UNIT-V

9	a)	Explain various types of general purpose registers in TMS 320C6X DSP processor.	CO1	7 Marks
	b)	Explain about various on-chip peripherals provided on DSP processors.	CO1	7 Marks

(OR)

10	a)	Explain the VLIW architecture with its block diagram. State the advantages and disadvantages of VLIW architecture.	CO1	7 Marks
	b)	Explain the features of TMS 320C6X DSP processor.	CO1	7 Marks

CODE No.: 16BT5HS02 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations June – 2022

COSTING AND FINANCE MANAGEMENT FOR CIVIL ENGINEERS
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 What is preliminary estimation of costs? Explain. CO1, CO3 14 Marks

(OR)

2 Explain the following concepts: CO1 14 Marks
i) Sunk cost. ii) Opportunity cost.

UNIT-II

3 A company undertook a contract for construction of a large building complex. The construction work commenced on 1st April, 2000 and the following data are available for the year ended 31st March, 2001. CO1, CO4 14 Marks

	Rs. '000		Rs. '000
Contract Price	35,000	Plant Hire Charges	1,750
Work Certified	35,000	Wages Related Costs	500
Progress Payments Received	15,000	Site Office Costs	678
Materials Issued to Site	7,500	Head Office Expenses Apportioned	375
Planning & Estimating Costs	1,000	Site Expenses Incurred	902
Direct Wages Paid	4,000	Work Not certified	149
Materials Returned From site	250		

The contractors own a plant which originally cost Rs.20 lacs has been continuously in use in this contract throughout the year. The residual value of the plant after 5 years of life is expected to be Rs.5 lacs. Straight line method of depreciation is in use . As on 31st March, 2001 the direct wages due and payable amounted to Rs.2,70,000 and the materials at site were estimated at Rs.2,00,000.

Require:

i) Prepare the contract account for the year ended 31st March, 2001.
ii) Show the calculation of profit to be taken to the profit and loss account of the year.
iii) Show the relevant balance sheet entries.

(OR)

4 Analyze the calculation of profit on uncompleted contracts. Explain. CO2, CO3 14 Marks

UNIT-III

5 Distinguish between forecast and a budget. Give examples to illustrate the difference between the two. CO2 14 Marks

(OR)

6 Discuss briefly the objectives and limitations of budgetary control. CO1 14 Marks

UNIT-IV

7	What is incremental cash flow? Explain.	CO1	14 Marks

(OR)

8	Coastal software Ltd., is proposing to mechanize their operations. Two proposals M and N in form of quotations have been received from two different vendors. The proposal in each case costs Rs.5,00,000. A discount factor of 12% is used to compare the proposals. CFAT are likely to be as under:	CO3, CO4	14 Marks

Year	Project M (Rs.)	Project N (Rs.)
1	1,50,000	50,000
2	2,00,000	1,50,000
3	2,50,000	2,00,000
4	1,50,000	3,00,000
5	1,00,000	2,00,000

Which one do you recommend under Present Value method?

UNIT-V

9	Elaborate sources of working capital.	CO1	14 Marks

(OR)

10	Critically analyze the significance of cash conversion cycle in working capital management.	CO2, CO3	14 Marks

CODE No.: 16BT41204 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations June – 2022

THEORY OF COMPUTATION

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Construct a DFA equivalent to the NFA. CO1 10 Marks

	0	1
q1	{q1}	{q1, q2}
q2	{q3}	{q3}
q3	{q4}	{q4}
q4	{}	{}

b) Tabulate the differences between Moore and Mealy machines. CO2 4 Marks

(OR)

2 a) Convert the following ε-NFA to DFA CO1 10 Marks

	0	1
$\rightarrow p$	{ p, q }	{ p }
q	{ r }	{ r }
r	{ s }	∅
$* \ s$	{ s }	{ s }

b) List and explain briefly about the components of Finite automaton model. CO1 4 Marks

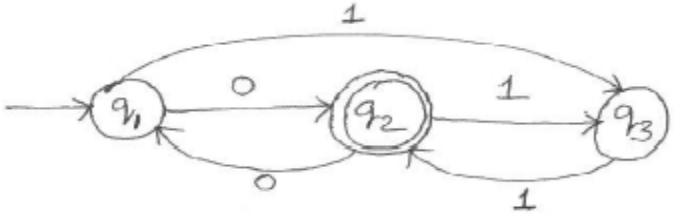
UNIT-II

3 a) Construct a NFA equivalent to the regular expression 10 + (0+11)0*1. CO3 10 Marks

b) Prove that the language L = {0^p,p is prime} is not regular. CO5 4 Marks

(OR)

4 a) Obtain the regular expression denoting the language accepted by the following DFA by using the formula R_{ij}^k. CO3 8 Marks



b) State and explain pumping lemma for regular languages. CO1 6 Marks

UNIT-III

5 a) Obtain a CFG to generate the set of all strings over alphabet {a, b} with exactly twice as many a's as b's. CO3 7 Marks

b) Show that the grammar is ambiguous. CO1 7 Marks
$S \rightarrow aSbS \mid bSaS \mid \epsilon$

(OR)

6	a)	Remove useless symbols and use less productions from the given grammar; $S \rightarrow aAa$ $A \rightarrow Sb \mid bcc \mid DaA$ $C \rightarrow abb \mid DD$ $E \rightarrow ac$ $D \rightarrow aDA$	CO1	8 Marks
	b)	Explain pumping lemma for context free languages.	CO1	6 Marks

UNIT-IV

7	a)	Define pushdown automata and explain its model with a neat diagram.	CO1	6 Marks
	b)	Construct PDA generating all odd palindromes over string {a, b, c}.	CO4	8 Marks

(OR)

8	a)	Construct PDA for the following grammar; $S \rightarrow aABB \mid aAA$ $A \rightarrow aBB \mid a$ $B \rightarrow A$.	CO3	10 Marks
	b)	Write short notes on Deterministic Pushdown Automata.	CO1	4 Marks

UNIT-V

9		Define Turing machine with an example. Explain different types of Turing machines.	CO1	14 Marks

(OR)

10	a)	Differentiate multi tape and multi stack Turing machines.	CO1	9 Marks
	b)	Design a Turing machine that computes a function $\boldsymbol{f}(\boldsymbol{x},\boldsymbol{y}) = \boldsymbol{x} - \boldsymbol{y}$ (proper subtraction)	CO5	5 Marks

CODE No.: 16BT50101 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations June - 2022

IRRIGATION ENGINEERING
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		The left branch canal carrying discharge of 20 cumecs has cultural command area of 20,000 hectares. The intensity of rabi crop is 80 percent and the base period is 120 days. The right branch canal carrying discharge of 8 cumecs has culturable command area of 12,000 hectares, intensity of irrigation of rabi crop is 50 percent and the base period is 120 days. Compare the efficiencies of the two canal systems.	CO5	14 Marks
		(OR)		
2	a)	Enlist the different factors affecting duty. Discuss how duty can be improved.	CO1	7 Marks
	b)	Describe various forms of a soil moisture with a neat sketch and what do you understand by the available moisture.	CO2	7 Marks

UNIT-II

3	a)	Discuss briefly the causes of failure of weirs on permeable foundation and their remedies.	CO2	7 Marks
	b)	Write a note on Khosla's theory of design of weirs on permeable foundation.	CO1	7 Marks
		(OR)		
4	a)	Discuss the various advantages and disadvantages of location of canal headworks.	CO2	7 Marks
	b)	What are the various effects of construction of a weir on the river regime?	CO1	7 Marks

UNIT-III

5	a)	Define gallery. Discuss the classification of galleries in a gravity dam, state its purposes.	CO1	7 Marks
	b)	Explain the stability analysis of a gravity dam.	CO6	7 Marks
		(OR)		
6	a)	Explain the elementary profile of a gravity dam with a neat sketch.	CO2	7 Marks
	b)	Describe various types of earth dams with a neat sketch.	CO2	7 Marks

UNIT-IV

7	a)	What is a canal escape and discuss different types of canal escapes?	CO1	7 Marks
	b)	Explain design procedure for canal cross regulator and head regulator.	CO2	7 Marks
		(OR)		
8		Determine the dimensions of the irrigation channel for the following date B/D ratio = 3.7; N=0.0225; m=1 and S=1/1000. Side slopes of the channel is 1/2 Horizontal to Vertical. Also determine the discharge which will be flowing in the channel.	CO3	14 Marks

UNIT-V

9	a)	What do you understand by bank connections? Draw a sketch of the bank connections of a syphon aqueduct.	CO1	7 Marks
	b)	What is a transition? State its purposes and discuss the various methods for the design of transition.	CO2	7 Marks
		(OR)		
10	a)	Describe the procedure for the design of a syphon aqueduct.	CO3	7 Marks
	b)	Explain the procedure for the design of a canal syphon.	CO4	7 Marks

CODE No.: 16BT50102 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations June – 2022

REINFORCED CEMENT CONCRETE STRUCTURES
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	Interpret the details and design a doubly reinforced beam to carry a superimposed load of 60kN/m. The overall depth and width of the beam are restricted to 840 mm and 300 mm respectively. The beam has a clear span of 5 m and a bearing of 50 cm on each end. Take σcbc=5 N/mm, σst=140 N/mm and m=18. Draw the reinforcement details.	CO2	14 Marks
	(OR)		
2	Sketch the reinforcement a detail of a rectangular beam is to be simply supported on supports of 230 mm width. The clear span of the beam is 6 m. The beam is to have a width of 300 mm, the characteristic superimposed load is 12 KN/m. Design the beam and sketch the reinforcement details.	CO3	14 Marks

UNIT-II

3	Design a cantilever beam of uniform depth for a span of 3.5m, if the superimposed load is 30 kN/m and it is monolithic with R.C column of 300 mm width and 400 mm deep. Use M20 grade concrete and Fe415 steel.	CO3	14 Marks
	(OR)		
4	An RCC beam 230 mm wide and 450 mm deep is reinforced with 4 bars of 16 mm dia of grade Fe415 on tension side. If design shear force is 60 kN, design the shear reinforcement consisting only of vertical stirrups. The grade of concrete used is M20.	CO3	14 Marks

UNIT-III

5	Design a reinforced concrete slab to carry a live load 3 kN/m² on an effective span of 3.5 m. Using M 20 grade concrete and Fe 415 steel reinforcement. Sketch the reinforcement details.	CO3	14 Marks
	(OR)		
6	Design a two way slab for a room size 4m x 5m with discontinuous and simply supported edges on all four sides with corners prevented from lifting to supported a live load 4 kN/m². Adopt M 20 grade concrete and Fe 415 HYSD bars.	CO3	14 Marks

UNIT-IV

7	Design of short column subjected to biaxial bending. Determine the reinforcement for a short column for the following data. Column size: 400mmx600mm, Pu=2000kN, Mux=160kN, Muy=120kN Use M20 grade concrete and Fe415 grade steel.	CO3	14 Marks
	(OR)		
8	Design a rectangular column, 5m long restrained in position and direction at both ends, to carry an axial load of 120 kN. Use M20 and Fe415 grades.	CO3	14 Marks

UNIT-V

9	A rectangular column 600 x 400 mm carries a load of 800 KN. Design a rectangular footing to support the column. The safe bearing capacity of the soil is 200 KN/m^2. Use M20 grade concrete.	CO3	14 Marks
	(OR)		
10	Design a dog-legged stair for a building in which the vertical distance between the floors is 3.6m. The Stair hall measures 2.4m x 5m (inner dimensions). The live load on the stair is 3000N/m^2. Adopt M20 Grade concrete and Fe415Grade Steel. Live load on the stair is 3000N/m^2. Adopt M20 Grade concrete and Fe415Grade Steel.	CO3	14 Marks

CODE No.: 16BT50103 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations June – 2022

SOIL MECHANICS
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What is a soil? What are the mineral constituents of a soil? Explain with the help of neat sketches. The structure of any three clay minerals.	CO1	7 Marks
	b)	A soil sample has a porosity of 40%. The specific gravity of solids 2.70. Calculate: i) Void ratio. ii) Dry density. iii) Unit weight if the soil is 50% saturated. iv) Unit weight if the soil is completely saturated.	CO2	7 Marks
		(OR)		
2	a)	Describe the Indian Standard soil classification system.	CO7	7 Marks
	b)	The dry unit weights of sand in the loosest and densest states are respectively 13.34 kN/m^3 and 21.40 kN/m^3. Assuming the specific gravity of the solids is 2.67, determine the relative density of sand with porosity of 30%.	CO2	7 Marks

UNIT-II

3	a)	Write down the procedure for determination of permeability by constant head test in the laboratory.	CO1	7 Marks
	b)	The falling head permeability test was conducted on a soil sample of 4cm diameter and 18cm length. The head fell from 1.0m to 0.40m in 20 minutes. If the cross-sectional area of the stand pipe was 1cm^2, determine the coefficient of permeability.	CO2	7 Marks
		(OR)		
4	a)	What is meant by total stress, neutral stress and effective stress and give its relationship.	CO2	6 Marks
	b)	Compute the total, effective and pore pressure at a depth of 20 m below the bottom of a lake 6 m deep. The bottom of lake consists of soft clay with a thickness of more than 20 m. The average water content of the clay is 35% and specific gravity of the soil may be assumed to be 2.65.	CO3	8 Marks

UNIT-III

5	a)	Explain how Newmark's influence chart is constructed and how it is used to find the vertical stress at a point below the ground surface.	CO8	6 Marks
	b)	A water tank is supported by a ring foundation having outer diameter of 10m and inner diameter of 7.5 m. The ring foundation transmits uniform load intensity of 160 kN/m^2. Compute the vertical stress induced at depth of 4 m, below the centre of ring foundation, using (i) Boussinesq analysis and (ii) Westergaard's analysis, taking $\mu = 0$. 1) Midway between the footings at a depth of 3.5 m below the footing level. 2) Vertically below the centre of each footing at the same depth of 3.5 m.	CO2	8 Marks

(OR)

6	a)	What are the different methods of compaction adopted in the field? How would you select the type of roller to be used?	CO4	6 Marks
	b)	For constructing an embankment, the soil is transported from a Borrow area using a truck which can carry 6m³ of soil at a time. With the following details, determine the number of truck loads of soil required to obtain 100m³ of compacted earth fill and the volume of borrow pit.	CO2	8 Marks

Property	Borrow area (In-situ)	Truck (Loose)	Field (Compacted)
Bulk Unit Weight (kN/m³)	16.6	11.5	18.2
Water Content (%)	14	8	6

UNIT-IV

7	a)	Discuss the spring analogy for primary consolidation. What are its uses?	CO1	6 Marks
	b)	A layer of soft clay is 6m thick and lies under a newly constructed building. The weight of sand overlying the clay layer produces a pressure of 2.6kg/cm² and the new construction increases the pressureby1.0kg/cm². If the compression index is 0.5. Compute the settlement. Water content is 40% and specific gravity of grains is 2.65.	CO3	8 Marks

(OR)

8	a)	Distinguish normally consolidated soils and over consolidated soils. What is over consolidation ratio?	CO1	6 Marks
	b)	An undrained soil sample 30cm thick got 50% consolidation in 20 minutes with drainage allowed at top and bottom in the laboratory. If the clay layer from which the sample was obtained is 3m thick in field condition, estimate the time it will take to consolidate 50% with double surface drainage and in both cases, consolidation pressure is uniform.	CO3	8 Marks

UNIT-V

9	a)	Explain vane shear test with the help of neat sketch.	CO8	6 Marks
	b)	A saturated specimen of cohesionless and was tested in triaxial compression and the sample failed at a deviator stress of 482kN/m² when the cell pressure was 100kN/m² under the drained conditions. Find the effective angle of shearing resistance of sand. What would be the deviator stress and the major principal stress at failure for another identical specimen of sand, if it is tested under cell pressure of 200kN/m². Use either Mohr's circle method or analytical method.	CO2	8 Marks

(OR)

10	a)	What is critical void ratio? Explain briefly Skempton's pore pressure coefficients.	CO1	5 Marks
	b)	Following are the results of un-drained tri-axial compression test on two identical soilspecimens, at failure:	CO2	9 Marks

Lateral pressure σ_3 (kN/m²)	100	300
Total vertical pressure σ_1 (kN/m²)	440	760
Pore water pressure u (kN/m²)	- 20	60

Determine the cohesion and angle of shearing resistance:

i) Referred to total stress.

ii) Referred to effective stress.

CODE No.: 16BT50104 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations June - 2022

STRUCTURAL ANALYSIS-II
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Derive the expression for maximum bending moment and shear force for a simply supported beam with a moving UDL longer than the span.	CO1	7 Marks
	b)	A uniform load of 5 kN/m run covering a length of 15 m, crosses a girder of span 50 m. Find the values of maximum bending moment and shear force at a section 10 m from the left support.	CO2	7 Marks

(OR)

2		A train of 5-wheel loads 60 kN, 80 kN, 200 kN, 130 kN and 120 kN spaced 2.5 m between the consecutive loads crosses a beam of span 22.5 m with 120 kN load leading. Calculate the maximum positive and negative shear force values at the centre of the span and the absolute maximum bending moment anywhere in the span. Use Influence Lines method.	CO2	14 Marks

UNIT-II

3		Analyse the continuous beam shown in figure 01, by slope deflection method and draw the bending moment diagram.	CO6	14 Marks

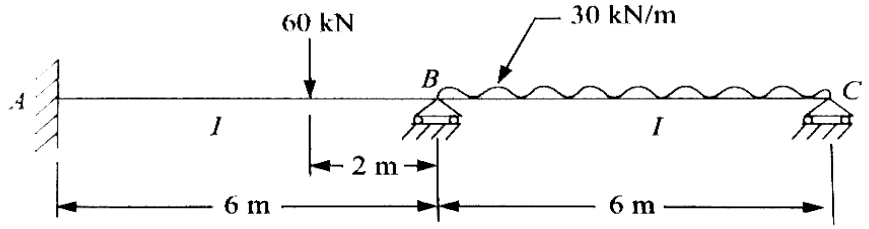


Figure 01

(OR)

4		Analyse the continuous beam shown in figure 02, using moment distribution method.	CO6	14 Marks

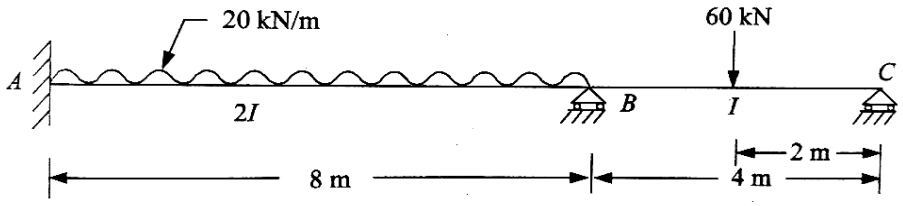


Figure 02

UNIT-III

5		Analyse the continuous beam shown in figure 03 by Kani's method. Flexural rigidity is constant throughout.	CO4	14 Marks

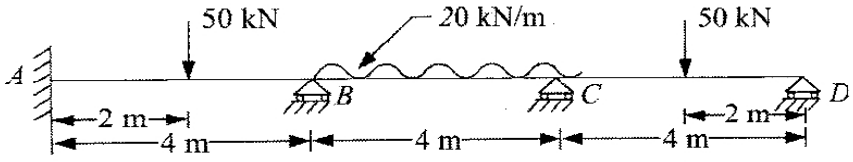


Figure 03

(OR)

6 A simply supported beam of span 12 m shown in figure 04 is loaded with 40 kN loads at C, D and E. Determine the vertical deflection at D. Take EI= 20000 kNm^2. CO2 14 Marks

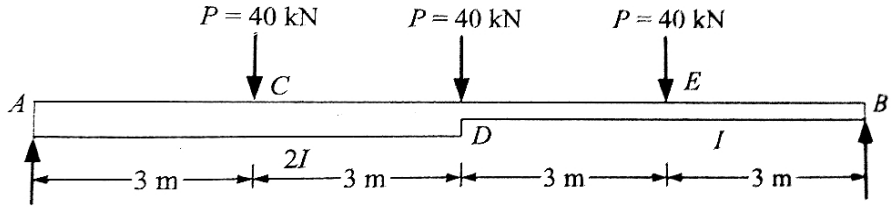


Figure 04

UNIT-IV

7 a) Differentiate the statically determinate structures and statically indeterminate structures. CO2 7 Marks

b) Write short notes on Static and Kinematic Indeterminacy. CO5 7 Marks

(OR)

8 Find the forces in the members of truss shown in figure 05. The cross-sectionalarea and young's modulus of all the members are the same. CO4 14 Marks

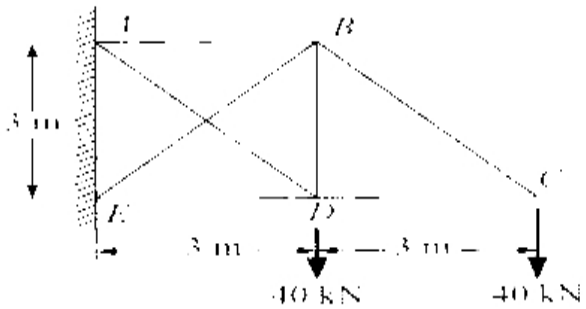


Figure 05

UNIT-V

9 a) Briefly explain the idealized stresses in plastic analysis. CO1 7 Marks

b) Determine the shape factor for the rectangular and circular section. CO3 7 Marks

(OR)

10 Calculate the plastic moment capacity required for the continuous beam with working loads shown in figure 06. CO3 14 Marks

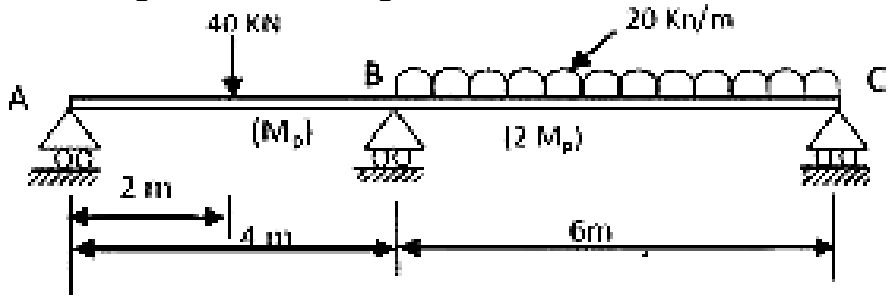


Figure 06

❀ ❀ ❀

CODE No.: 16BT50105 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations June – 2022

WASTE WATER TECHNOLOGY

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Briefly explain the various factors to be-considered in the design of sewerage system. Design a sanitary sewer to serve a population of 6000 with per capita water supply rate of 135 **lpcd**. Assume n = 0.013.	CO3	7 Marks
	b)	State the functions of Manhole. Describe with the help of neat sketch the components of a manhole and discuss on communicating about its usefulness to society in maintenance of sewerage system.	CO9	7 Marks
		(OR)		
2	a)	Briefly explain the various factors to be considered in the design of sewerage system. Design a sanitary sewer to a population of 7,000 receiving water at 90 **lpcd**. Minimum self cleansing velocity at design flow is 0.8 m/s, maximum depth of flow is 0.5D. Assume other design criteria as applicable.	CO3	7 Marks
	b)	Describe the conservancy and water carriage system of sanitation. In new developing town which method you will prefer and why?	CO1	7 Marks

UNIT-II

3	a)	The BOD_5 at 27°C of wastewater sample has been measured as 480 mg/L. What portions of ultimate BOD would remain unoxidised after 7^{th} and 10^{th}day at 20°C? Assume the reaction rate constant at 20°C as 0.21 d^{-1}.	CO2	7 Marks
	b)	Estimate the settling velocity of spherical particle of specific gravity 2.65 and diameter 0.18mm. Take kinematic viscosity of water as 1.016×10^{-2} m/s.	CO2	7 Marks
		(OR)		
4	a)	Design a screen for a proposed sewage treatment plant (STP) of 60 MLD.	CO3	7 Marks
	b)	Summarize the role of Screen Chamber in Sewage treatment plant and write its design procedure.	CO1	7 Marks

UNIT-III

5	a)	Explain the mechanism of working of a trickling filter with a neat sketch.	CO1	7 Marks
	b)	Design an oxidation ditch for a community of 7500 with per capita sewage contribution of 90 **lpcd** and BOD 250 mg/l, the desired BOD of the treated sewage is 30 mg/l.	CO3	7 Marks
		(OR)		
6	a)	Explain how the algal-bacterial symbiosis with respect to waste stabilization pond can be recommended for the benefit of society in treatment of sewage.	CO4	7 Marks
	b)	Explain activated sludge process (ASP) in treating waste water with neat flow diagram. Discuss the various design parameters involved in it.	CO1	7 Marks

UNIT-IV

7	a)	Discuss the need for sludge treatment and explain the health effects of disposal of untreated sludge disposal.	CO6	7 Marks
	b)	Explain briefly the process of removing of nitrogen and phosphorus from waste water and standards followed in disposal of wastewater.	CO8	7 Marks

(OR)

8	a)	Discuss briefly the various methods of sewage disposal.	CO5	7 Marks
	b)	Explain briefly about the removal process of suspended solids and pathogenic bacteria.	CO1	7 Marks

UNIT-V

9	a)	Summarize the principle of the self-purification process of river and the various stages of oxygen sag curve and communicate its uses.	CO9	7 Marks
	b)	Explain briefly when the on land disposal system of sewage can be recommended.	CO4	7 Marks

(OR)

10	a)	With a neat sketch explain the function of soak pit.	CO1	7 Marks
	b)	Design a septic tank with neat sketch for a hostel having 250 students. Design sewage flow is 60 **lpcd**.	CO3	7 Marks

CODE No.: 16BT50201 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations June – 2022

CONTROL SYSTEMS

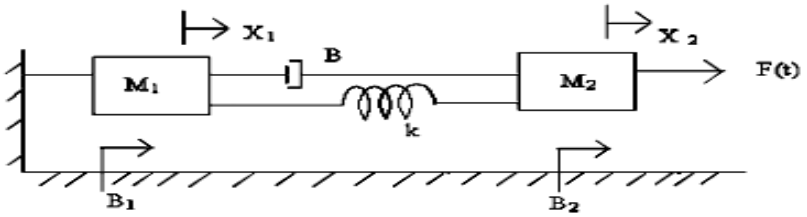
[Electrical and Electronics Engineering, Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

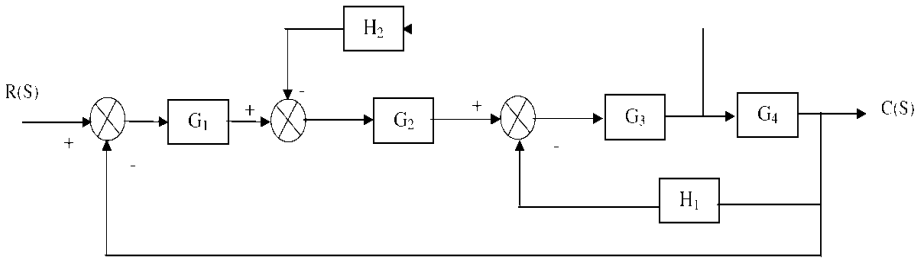
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Determine the transfer function $\frac{X_2(s)}{F(s)}$ for the mechanical system shown in below figure. CO4 7 Marks

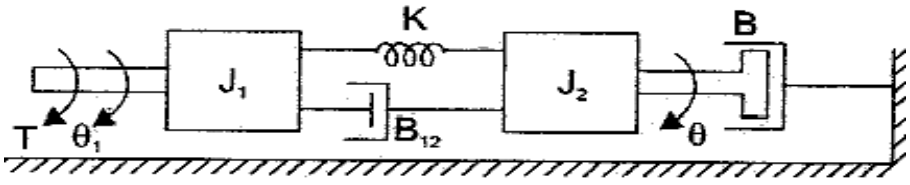


b) Determine the overall system transfer function C(S)/R(S) for the system shown below. CO4 7 Marks



(OR)

2 a) Write the differential equations governing mechanical rotational system shown in below figure. And determine the transfer function $\frac{\theta(s)}{T(s)}$. CO4 7 Marks



b) Apply open loop and closed loop control systems for traffic control system. CO6 7 Marks

UNIT-II

3 a) Illustrate the effect of damping ratio on the location of closed-loop poles of a standard second order system. CO1 7 Marks

b) The open-loop transfer function of a unity feedback system is given by $G(s) = \frac{20}{s(0.2s+1)}$ Calculate positional error constant (K_p), Velocity error constant (K_v), Acceleration error constant (K_a) and steady state error when the system is excited with unit step signal. CO4 7 Marks

(OR)

4	a)	Sketch the root locus of a unity feedback system whose open loop transfer function is given by $G(s) = \frac{K}{s(s+3)(s+6)}$.	CO4	7 Marks
	b)	For the system to be stable, Determine the range of K of a unity feedback system whose open-loop transfer function given by $G(s) = \frac{K}{s(s^2+2s+1)(s+4)}$.	CO4	7 Marks

UNIT-III

5		Sketch the Bode plots showing the magnitude in dB and phase angle in degrees as a function of log frequency for the transfer function $G(s)H(s) = \frac{2000}{s(s+2)(s+100)}$. Determine the gain crossover frequency, Phase crossover frequency, gain margin and phase margin. Also, determine the gain and the corresponding phase margin for a gain crossover frequency of 50 rad/sec.	CO5	14 Marks

(OR)

6		Draw the Nyquist plot and assess the stability of the closed-loop system whose open-loop transfer function is given by $G(s)H(s) = \frac{(6s+1)}{s(s+1)(3s+1)}$.	CO5	14 Marks

UNIT-IV

7		Explain the effect PI and PD controller on time response characteristics of second order system.	CO1	14 Marks

(OR)

8		Explain the realization of basic lag compensator using a Bode plot.	CO2	14 Marks

UNIT-V

9	a)	Develop the state space model for linear continuous systems.	CO2	7 Marks
	b)	The state model of linear system is described by	CO4	7 Marks

$$\dot{X}(t) = \begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix} \begin{bmatrix} x_1(t) \\ x_2(t) \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u(t) \ .$$

Find the solution of the state equation for the unit step input when, $X(0) = \begin{bmatrix} 1 \\ 1 \end{bmatrix}$.

(OR)

10		Given the system	CO4	14 Marks

$\dot{X} = AX + BU,$

$Y = CX + DU$

Where $A = \begin{bmatrix} -1 & 1 & 0 \\ 0 & -1 & 1 \\ 0 & 0 & -1 \end{bmatrix}$, $B = \begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix}$, $C = \begin{bmatrix} 1 & 0 & 1 \end{bmatrix}$

Determine the state controllability and observability of the system.

CODE No.: 16BT50203 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations June - 2022

SYNCHRONOUS MACHINES
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What are the causes of harmonics in the emf waveform of synchronous generators? Also discuss the various ways to minimize them.	CO1	8 Marks
	b)	A 3-phase alternator has 2 slots per pole per phase and coil span of 5 slot pitches. The flux density wave of alternator consists of a fundamental and a 25% third harmonic. Calculate the percentage increase in the phase voltage due to harmonic.	CO4	6 Marks
		(OR)		
2	a)	Write the differences between integral-slot and fractional-slot winding.	CO1	6 Marks
	b)	Develop the phasor diagram for a cylindrical-rotor alternator in case the alternator operates at an internal power factor of : i) ZPF lagging. ii) ZPF leading. iii) UPF. Discuss the nature of armature reaction **mmf** in each case.	CO2	8 Marks

UNIT-II

3	a)	Explain the method of determining voltage regulation of an alternator by emf method.	CO1	6 Marks
	b)	A 100 kVA, 3000V, 50Hz, 3-phase, star connected alternator has effective armature resistance of 0.2Ω per phase. The field current of 50 A produces short-circuit current of 200A and an open-circuit **emf** of 1040 V (line-to-line). Calculate the full-load voltage regulation at 0.8 p.f. lagging and also 0.8 p.f. leading. Draw phasor diagrams.	CO4	8 Marks
		(OR)		
4	a)	Derive the equation for power developed in a salient pole synchronous generator.	CO2	8 Marks
	b)	Discuss about the reluctance power developed in a salient pole synchronous generator.	CO1	6 Marks

UNIT-III

5	a)	With the help of phasor diagram, explain the effect of excitation control of an alternator operating in parallel with another alternator supplying a common load.	CO1	6 Marks
	b)	Two star-connected synchronous generators connected in parallel have an **emf** of 1200V per phase share a common star-connected load of impedance Z_L = (2+j1.0)Ω/phase. The synchronous impedance of the machines are Z_{s1} = (0.1+j2)Ω/phase and Z_{s2} = (0.2+j3)Ω/phase respectively. Determine the no-load circulating current when two machines internal emfs have a phase difference of 5^0 electrical.	CO4	8 Marks
		(OR)		
6	a)	How does the parallel operation of two alternators differ from the condition when an alternator run with an infinite bus bar?	CO2	6 Marks
	b)	How is the power sharing affected in parallel operation when; i) excitation of one of them is changed. ii) prime mover input to one of them is changed.	CO2	8 Marks

UNIT-IV

7	a)	Explain why a synchronous motor is not self-starting. Describe any one method of starting a synchronous motor.	CO1	8 Marks
	b)	A 3-phase 11 kV star-connected synchronous motor takes 50A input current. The effective resistance and synchronous reactance per phase are 1Ω and 30Ω respectively. Calculate the induced **emf** for a power factor of i) 0.8 lagging. ii) 0.8 leading. iii) Power supplied to the motor.	CO4	6 Marks

(OR)

8	a)	Explain the effect of varying excitation on armature current and power factor in a synchronous motor. Draw V-curves and state their significance.	CO1	8 Marks
	b)	A 3-phase synchronous motor of 8000W at 1100V has synchronous reactance of 8Ω per phase. Find the minimum current and the corresponding induced **emf** for full-load condition. The efficiency of the machine is 80%. Neglect armature resistance.	CO4	6 Marks

UNIT-V

9		Mention the problems usually encountered when a DC series motor is operated on AC. What design modifications are to be incorporated for its satisfactory operation on AC?	CO1	14 Marks

(OR)

10	a)	List out the disadvantages of single phase induction motor when compared with a 3-phase induction motor.	CO2	6 Marks
	b)	Describe, with reasons, the type of motor that would be used for the following applications: i) Washing machine. ii) Refrigerators. iii) Ceiling fans. iv) Food mixer.	CO6	8 Marks

CODE No.: 16BT50301 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations June - 2022

DESIGN OF MACHINE ELEMENTS-II
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		A journal bearing is proposed for a steam engine. The load on the journal is 3 kN, diameter 50 mm, length 75 mm, speed 1600 r.p.m., diametral clearance 0.001 mm, ambient temperature 15.5°C. Oil SAE 10 is used and the film temperature is 60°C. Determine the heat generated and heat dissipated. Take absolute viscosity of SAE10 at 60°C = 0.014 kg/m-s.	CO2	14 Marks

(OR)

2		A 80 mm long journal bearing supports a load of 2800 N on a 50 mm diameter shaft. The bearing has a radial clearance of 0.05 mm and the viscosity of the oil is 0.021 kg/m-s at the operating temperature. If the bearing is capable of dissipating 80 J/s, determine the maximum safe speed.	CO3	14 Marks

UNIT-II

3		The rolling contact ball bearing are to be selected to support the Overhung countershaft. The shaft speed is 720 r.p.m. The bearings are to have 99% reliability corresponding to a life of 24000 hours. The bearing is subjected to an equivalent radial load of 1 kN. Consider life adjustment factors for operating condition and material as 0.9 and 0.85 respectively. Find the basic dynamic load rating of the bearing from manufacturer's catalogue, specified at 90% reliability.	CO4	14 Marks

(OR)

4	a)	What are rolling contact bearings? Discuss their advantages over sliding contact bearings.	CO1	7 Marks
	b)	Write short note on classifications and different types of antifriction bearings.	CO1	7 Marks

UNIT-III

5		A cast steel spur gear pinion having 21 teeth and rotating at 1500 r.p.m is required to transmit 9kW to a high grade to run at 500 r.p.m. The teeth are 14.5º Involute form. Design the gears completely.	CO3	14 Marks

(OR)

6		Write the design procedure for Helical gears.	CO1	14 Marks

UNIT-IV

7	a)	Derive shear stress equation for helical spring.	CO5	6 Marks
	b)	Design a leaf spring for the following specifications for a truck maximum load on spring = 120kN, no. of springs = 4, material of spring = Cr Va Steel, span of spring =1200 mm, width of central band = 200 mm, permissible deflection= 120mm.	CO3	8 Marks

(OR)

8	a)	Explain about concentric helical springs under compression due to axial load with neat sketch.	CO1	7 Marks
	b)	A laminated spring having 6 graduated leaves is simply supported at ends at a distance of 0.9 m. it is made of steel having allowable bending stress of 360 MPa. The width and thickness of leaves are 90 mm and 6 mm. find the safe load that can be carried by this spring at the middle and the deflection under that load.	CO3	7 Marks

UNIT-V

9		A belt is running over a pulley of diameter 120 cm at 200 r.p.m. The angle of contact is 1650 and co-efficient of friction between the belt and pulley is 0.3. If the maximum tension in the belt is 3000 N. find the power transmitted by the belt.	CO6	14 Marks

(OR)

10	a)	Explain the various stresses induced in the connecting rod.	CO1	7 Marks
	b)	The cylinder of four stroke diesel engine has following specifications: Break power = 5kW; Speed = 600 r.p.m; Indicated mean effective pressure = 0.5 MPa; Make suitable assumptions and calculate: i) Bore and length of cylinder. ii) Thickness of cylinder liner. iii) Thickness of cylinder head. iv) Size, number and pitch of studs.	CO3	7 Marks

CODE No.: 16BT50302 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations June – 2022

INDUSTRIAL ENGINEERING AND MANAGEMENT
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1		State and explain Henry Fayol's principles of management.	CO1	14 Marks
		(OR)		
2		What do you understand by corporate social responsibility? Discuss the social responsibilities of a management.	CO1	14 Marks
		UNIT-II		
3		What are the various types of plant layout? Explain them clearly bringing out comparative advantages and disadvantages.	CO1	14 Marks
		(OR)		
4	a)	A total of 50 components whose mean time to failure is known to be 200 hours are placed on test continuously. Estimate the number of components which would fail in the time intervals 0 to 50, 50 to 100, 100 to 150 and 150 to 200.	CO2	4 Marks
	b)	A transport bus uses a total of six tyres one on each side of front end and two on each side of rear end. The tyres used at the rear end are identical and each has a failure rate of 0.5×10^{-5} failures per km. Similarly, the tyres at the front end are identical with a failure rate of 0.6×10^{-5} failures per km. Determine the probability that the buses will not fail due to tyre failure for 20000 km. Assume that at the rear end one tyre on each side is sufficient to do the job.	CO5	10 Marks
		UNIT-III		
5		"Productivity is a means for increasing the welfare of the nation". Justify the statement.	CO1	14 Marks
		(OR)		
6		List the procedural steps involved in time study and give the importance of allowances in time study.	CO1	14 Marks
		UNIT-IV		
7		Define materials management. Explain the functions involved in stores management.	CO1	14 Marks
		(OR)		
8		A Company requires 5000 units per year which costs Rs. 10 per unit. Ordering cost is estimated to be Rs. 100 per order, carrying costs are 15 % per annum of average inventory. The supplier is prepared to give 2% discount in price if the company purchases 10,000 units or more but less than 20,000 lot size. A further discount of 1 % in price of original value is available on the orders of 20,000 or more units. Find economical lot size and the minimum total cost.	CO4	14 Marks
		UNIT-V		
9	a)	Discuss the importance of Investigation and analysis of Industrial accidents.	CO6	7 Marks
	b)	Discuss the importance of Indian Factories Act and its effect in the industry.	CO6	7 Marks

(OR)

10 Resistors for electronic circuits are manufactured on a high-speed automated machine. The machine is setup to produce a large run of resistors of 1000Ω each. To set up the machine and to create a control chart to be used throughout the run, 10 samples were taken with four resistors in each sample. The complete list of samples and their measured values are as follows: CO5 14 Marks

Sample Number	**Readings (in ohms)**			
1	1010	991	985	986
2	995	996	1009	994
3	990	1003	1015	1008
4	1015	1020	1009	998
5	1013	1019	1005	993
6	994	1001	994	1005
7	989	992	982	1020
8	1001	986	996	996
9	1006	989	1005	1007
10	992	1007	1006	979

Develop X-bar and R-charts and plot the values. Using these charts, comment about the process.

CODE No.: 16BT50303 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations June – 2022

METROLOGY AND MEASUREMENTS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What do you mean by line and end standards of length? Write down the characteristics of each of them.	CO1	7 Marks
	b)	Discuss the effect of temperature on the application of limits.	CO1	7 Marks
		(OR)		
2		Define the following. i) Accuracy. ii) Precision. iii) Readability. iv) Reproducibility. v) Calibration. vi) Range.	CO1	14 Marks

UNIT-II

3	a)	With the help of neat sketches, explain how a sine bar is used to determine the taper angle of an inclined surface.	CO1	7 Marks
	b)	Name the various factors affecting the accuracy of the sine bar and state the specification of sine bar.	CO1	7 Marks
		(OR)		
4	a)	Explicate the application of interferometer in measuring flatness of surfaces.	CO5	7 Marks
	b)	Explain interference method of measuring flatness of surface.	CO5	7 Marks

UNIT-III

5		The heights of peaks and valleys of 20 successive points on a surface are 80, 60, 88, 66, 78, 62, 80, 62, 81, 63, 83, 62, 80, 60, 80, 60, 81, 59, 82, 62 microns respectively, measured over a length 20 mm, Determine CLA and RMS values of roughness surface	CO4	14 Marks
		(OR)		
6		What is the principle of an auto collimator? Explain the procedure of performing straightness test using auto collimator.	CO5	14 Marks

UNIT-IV

7		Compare a three-wire and two-wire method of measuring the effective diameter of a screw.	CO2	14 Marks
		(OR)		
8		A spur gear of 4 mm module has 45 teeth. Calculate the following proportions i) Pitch circle diameter. ii) Addendum. iii) Dedendum. iv) Tooth working height. Assume the clearance to be 0.25 module. Compute the base pitch of the gear if the spur gear has a pressure angle of 20º.	CO3	14 Marks

UNIT-V

9	a)	Name the various types of strain gauges for different applications.	CO1	7 Marks
	b)	Define Strain Rosette. How it is used for strain measurement.	CO1	7 Marks
		(OR)		
10	a)	Explain working principle of electric resistant sensor.	CO1	7 Marks
	b)	Explain working principle of dead weight pressure gauge with a neat sketch.	CO1	7 Marks

CODE No.: 16BT50304 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations June - 2022

REFRIGERATION AND AIR CONDITIONING
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the simple air cooling system with a schematic diagram and show the cycle on T-S diagram.	CO1	7 Marks
	b)	A simple air cooling system is used for an aero plane having a load of 10 tonnes. The atmospheric Pressure and temperature are 0.9 bar and 10^0C respectively. The pressure increases to 1.013 bar due to ramming. The temperature of the air is reduced by 50^0C in heat exchanger. The pressure in the cabin is 1.01 bars and temperature of the air leaving the cabin is 25^0C. Determine: i) Power required to take the load of cooling cabin. ii) COP.	CO2	7 Marks

(OR)

2	a)	Define the following terms of refrigeration. i) Refrigerating effect. ii) Ton of refrigeration. iii) COP. iv) Refrigerator and heat pump.	CO1	8 Marks
	b)	Distinguish open and dense air refrigeration systems.	CO1	6 Marks

UNIT-II

3	a)	Illustrate the refrigeration cycle and T-S diagram. When the refrigerant is dry and saturated at the end of the compression and find an expression for the C.O.P.	CO3	8 Marks
	b)	What are the desirable properties of refrigerants and how do you select?	CO4	6 Marks

(OR)

4		Find the theoretical COP for a CO2 machine working between the temperature ranges of 25^oC and -5^oC. The dryness fraction of CO_2 gas during the suction stroke is 0.6. Following properties of CO_2 are given below.	CO6	14 Marks

Temp. (^{0}C)	Liquid		Vapour		Latent heat KJ/Kg
	Enthalpy kJ/kg	**Entropy KJ/kg k**	**Enthalpy kJ/kg**	**Entropy KJ/kg k**	
25	164.77	0.5978	282.23	0.9918	117.46
-5	72.57	0.2862	321.33	1.2146	248.76

UNIT-III

5	a)	Explain the working principle of steam jet refrigeration system.	CO1	6 Marks
	b)	Explain the working principle of thermoelectric refrigerator.	CO1	8 Marks

(OR)

6		In an aqua-ammonia VAR system of 10TR capacity, the vapour leaving the generator is 100% pure NH_3 saturated at 40^0c. The evaporator, absorber, condenser and generator temperatures are -20^0C, 30^0C, 40^0C and 70^0C respectively. At absorber exit, the concentration of NH_3 is x=0.38 and h=22 kJ/kg. At generator exit is x = 0.1 and h=69.5 kJ/kg. i) Determine mass flow rate of NH_3 in the evaporator. ii) Mass flow rate of weak and strong solution in the absorber. iii) Determine the heat rejection in absorber and condenser. iv) Heat added in generator. v) COP.	CO4	14 Marks

UNIT-IV

7	a)	Define the following. i) Specific humidity. ii) Relative humidity. iii) Sensible heating. iv) Sensible cooling. v) Humidification and dehumidification.	CO1	10 Marks
	b)	List the differences between summer and winter air conditioning systems.	CO1	4 Marks

(OR)

8		A class room of 60 seating capacity is air-conditioned. The outdoor conditions are 32^0C DBT and 22^0C WBT and the required comfort conditions are 22^0C and 55% RH. The quantity of outdoor air supplied is 0.5m^3/min/student. The comfort conditions are achieved first by chemical dehumidifying the air and then cooling by cooling coil. Find: i) DBT of air leaving the dehumidifier. ii) Capacity of dehumidifier.	CO5	14 Marks

UNIT-V

9		Explain the following. i) Effective temperature. ii) Comfort chart. iii) Requirements of human comfort.	CO1	14 Marks

(OR)

10	a)	Describe the following types of air filters for cleaning air with simple sketches. i) Viscous filter. ii) Wet filter.	CO1	6 Marks
	b)	What are the different methods of humidifying the air? Explain the working of any two types of humidifiers.	CO1	8 Marks

CODE No.: 16BT50305 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations June – 2022

THERMAL ENGINEERING-II

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the modified Rankine cycle with P-V and T-S diagrams.	CO1	7 Marks
	b)	A basic steam power plant works on ideal Rankine cycle between 35 bar and 0.04 bar. The initial condition of steam being 0.85 dry and flow rate 15 kg/s determine: i) Work required for pumping ii) Work done by the turbine and iii) Cycle efficiency.	CO2	7 Marks
		(OR)		
2	a)	Explain the working of Locomotive boiler with a neat sketch.	CO1	7 Marks
	b)	A simple Rankine cycle works between pressure 30 bar and 0.45 bar, the initial conditions of steam being dry saturated. Calculate the cycle efficiency, work ratio and specific steam consumption rate.	CO1	7 Marks

UNIT-II

3		A steam boiler evaporates 10 kg of water per kg of coal fired from feed water at 41°C when working at 9 bar pressure. Determine the equivalent evaporation from and at 100°C per kg of coal fired if steam produced is i) 0.95 dry ii) Dry and saturated, and iii) Super heated at 250°C.	CO1	14 Marks
		(OR)		
4	a)	Discuss in detail boiler draught and classification of boiler draught.	CO2	7 Marks
	b)	A boiler plant supplies 5600 kg of steam per hour at 9 bar 0.95 dry from feed water at 42°C when used 700 kg of coal per hour having calorific value of 32000 kJ/kg. Determine; i) The thermal efficiency of the boiler ii) The equivalent evaporation iii) The percentage saving in coal if feed water temperature is raised to 100°C by using economizer. Assume 5% increase in boiler efficiency, other conditions being same.	CO4	7 Marks

UNIT-III

5		Steam at pressure of 10 bar and 0.9 dry discharges through a nozzle having throat area of 450 mm^2. If the back pressure is 1 bar, find: i) Final velocity of the steam and ii) Cross sectional area of the nozzle at exit for maximum discharge.	CO3	14 Marks
		(OR)		
6		Explain the term governing of steam turbines. Describe any one method with a neat sketch.	CO1	14 Marks

UNIT-IV

7	a)	Write a short note on Degree of Reaction.	CO1	6 Marks
	b)	Explain with the help of a neat sketch a single Reaction turbine. Also explain the pressure and velocity variations along the axial direction.	CO5	8 Marks

(OR)

8	a)	Explain the working principle of counter flow jet condenser with neat sketch.	CO1	7 Marks
	b)	The vacuum efficiency of condenser is 96%, the temperature of condenser is 40°C.if the barometer reads 752 mm of Hg, find the vacuum gauge reading of the condenser.	CO5	7 Marks

UNIT-V

9	a)	Where is rocket propulsion used? What are the kinds of rocket propellants?	CO2	7 Marks
	b)	Derive an equation for thermal efficiency of a simple gas turbine cycle in terms of pressure ratio and specific heat ratio.	CO2	7 Marks

(OR)

10	a)	Write the deviations in actual gas turbine as compared with air standard cycle.	CO1	7 Marks
	b)	In a gas turbine plant working on Brayton cycle, the air at inlet is 27°C, 0.1 MPa. The pressure ratio is 6.25 and the maximum temperature is 800°C. The turbine and compressor efficiencies are each 80%. Find compressor work, turbine work, heat supplied, cycle efficiency and turbine exhaust temperature. Mass of air may be considered as 1 kg. Draw T-S diagram.	CO2	7 Marks

CODE No.: 16BT50401 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations June - 2022

DIGITAL COMMUNICATIONS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the principle of operation of DPCM Transmitter and Receiver with the block diagrams. Also outline the advantage of DPCM over PCM.	CO1	8 Marks
	b)	Compare different types of Quantization Techniques.	CO2	6 Marks
		(OR)		
2	a)	Compare and Contrast Digital and Analog Communication systems.	CO2	7 Marks
	b)	What is Quantization error? Explain in detail the effect of Quantization error over the recovered message signal.	CO1	7 Marks

UNIT-II

3	a)	The signal m(t) is band limited to 4KHz, is sampled at twice the Nyquist rate and the samples are transmitted by PCM. An Output SNR of 47dB required. Find the N.	CO3	6 Marks
	b)	Sketch the block diagram of Delta Modulation System and explain the function of each block.	CO1	8 Marks
		(OR)		
4		Estimate the Output Signal To Noise Ratio in DM System.	CO2	14 Marks

UNIT-III

5	a)	Implement a Digital System for generation and reception of DPSK signals with a neat block diagram.	CO6	8 Marks
	b)	Distinguish between ASK, FSK and PSK systems.	CO2	6 Marks
		(OR)		
6	a)	Implement a Matched filter and derive the Probability of error of a Matched Filter.	CO6	7 Marks
	b)	Sketch the power spectra of BPSK and BFSK and explain briefly.	CO1	7 Marks

UNIT-IV

7	a)	Illustrate how Error free communication over Noisy channel can be achieved	CO5	5 Marks
	b)	Implement a source Coding Encoder to more efficiently represent the information by using Huffman coding.	CO6	9 Marks
		(OR)		
8	a)	An event has six possible outcomes with the probabilities 0.5, 0.25, 0.125, 1/16, 1/32, 1/32. Find the entropy of the system. Also find the rate of information if there are 16 outcomes per second.	CO4	8 Marks
	b)	Define the following terms. i) Entropy. ii) Mutual information. iii) Channel Capacity. iv) Rate of information.	CO4	6 Marks

UNIT-V

9	a)	Illustrate how Interleaving can to use for detection and correction of Burst Errors.	CO4	5 Marks
	b)	Find (7, 4) cyclic codeword generated in Systematic and Non systematic form when message data D(1011), D(0101) is applied to Cyclic Encoder with generator polynomial of a is $g(x)=1+X+X^3$.	CO3	9 Marks
		(OR)		
10	a)	Illustrate the merits of cyclic codes.	CO3	6 Marks
	b)	The generator polynomial of a (7, 4) cyclic Encoder is $g(x)=1+X+X^2$. Find the all 8 possible code words of this code.	CO4	8 Marks

CODE No.: 16BT50402 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations June – 2022

MICROPROCESSORS AND MICROCONTROLLERS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Write an ALP for 8086 to find the largest and smallest byte from an array of *N* bytes.	CO4	7 Marks
	b)	Discuss architecture of Intel 8086.	CO1	7 Marks
		(OR)		
2	a)	Compose an ALP to perform String Reversal for Intel 8086.	CO4	7 Marks
	b)	Recall Intel 8086 flag register and outline the function of each bit in it.	CO1	7 Marks

UNIT-II

3	a)	Demonstrate how an 8086 is made capable of handling 64 hardware interrupts.	CO5	7 Marks
	b)	Explain the handshake sequence in RS232C standard between DTE and DCE.	CO2	7 Marks
		(OR)		
4	a)	Bring out the relation between Machine Cycle and Instruction Cycle. Sketch timing diagram for OpCode Fetch.	CO2	7 Marks
	b)	Apply interfacing concept to explain about the sequence in which Initialization control words are needed to interface interrupt handling capability in 8259A.	CO5	7 Marks

UNIT-III

5	a)	Develop an ALP to rotate a stepper motor of 1.8 degrees step size by 180 degrees in clock wise direction rotations. List the applications of it.	CO6	10 Marks
	b)	Compare synchronous to asynchronous modes of serial data transmission.	CO2	4 Marks
		(OR)		
6	a)	Show the setup to and write an ALP to interface a hexadecimal key pad to Intel 8086. Specify the applications of it.	CO6	10 Marks
	b)	Contrast strobed I/O mode and strobed bidirectional I/O mode.	CO2	4 Marks

UNIT-IV

7	a)	Describe the architecture of 8051 with neat diagram.	CO1	7 Marks
	b)	Interpret the logical instructions of 8051 with examples.	CO2	7 Marks
		(OR)		
8	a)	Explain the PIN detail of an 8051 microcontroller.	CO1	7 Marks
	b)	Illustrate the branching instructions available in 8051in detail.	CO2	7 Marks

UNIT-V

9	a)	Design flowchart and develop an ALP to initiate with the format of TCON register.	CO3	8 Marks
	b)	Contrast interrupt *vs* polling.	CO2	6 Marks
		(OR)		
10	a)	Formulate the sequence of different serial communication modes in 8051.	CO3	7 Marks
	b)	Compose 8051 ALP to read data from port 1 when negative edge triggered at INT0 and supply data to port 2 by masking upper bits.	CO5	7 Marks

❀ ❀ ❀

CODE No.: 16BT50403 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations June – 2022

VLSI DESIGN

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain different processes involved in the fabrication of CMOS transistor with necessary cross sectional diagrams.	CO1	8 Marks
	b)	Implement the Boolean function Y' = (AB + C) using pass transistor logic. Develop the layout corresponding to it.	CO4	6 Marks
		(OR)		
2	a)	Compare various forms of pull up arrangements for the inverter with the help of their transfer curves.	CO4	7 Marks
	b)	Tabulate the comparison between MOS and CMOS technologies various performance parameters.	CO2	7 Marks

UNIT-II

3	a)	Explain VLSI Design flow with the help of Flow Chart.	CO1	7 Marks
	b)	Define and give the expressions for any four scaling factors of MOS device parameters.	CO2	7 Marks
		(OR)		
4	a)	Explain the design rules for wires and contacts.	CO1	7 Marks
	b)	What is meant by standard unit of capacitance? Give some area capacitance calculations.	CO2	7 Marks

UNIT-III

5	a)	Implement booth multiplier and explain with an example.	CO3	7 Marks
	b)	Draw the block diagram of Carry skip adder, the basic cell layout and also explain its principle.	CO1	7 Marks
		(OR)		
6	a)	Explain the operation of 8 x 8 array multiplier with neat sketch.	CO1	7 Marks
	b)	Implement and explain the working of a ripple carry adder using transmission gates.	CO3	7 Marks

UNIT-IV

7	a)	Differentiate between structured design and full custom design.	CO2	6 Marks
	b)	Explain the macrocell architecture of a CPLD.	CO1	8 Marks
		(OR)		
8	a)	Compare the performance parameters of Complex Programmable Logic Devices and Field Programmable Gate Arrays.	CO1	8 Marks
	b)	Write short notes on standard cell design and cell libraries.	CO2	6 Marks

UNIT-V

9	a)	Identify the technology and device innovations for novel high speed low power VLSI devices.	CO6	7 Marks
	b)	Discuss about layout design for improved CMOS testability.	CO5	7 Marks
		(OR)		
10	a)	Briefly outline the need of low power VLSI chips in developing real electronics.	CO6	7 Marks
	b)	Explain the various factors that influence the power dissipation in CMOS VLSI circuits.	CO5	7 Marks

CODE No.: 16BT50501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations June – 2022

COMPUTER NETWORKS

[Electronics and Communication Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Sketch the Internet architecture.	CO1	7 Marks
	b)	Compare 4-Layer TCP/IP Model and 7-Layer OSI Model.	CO2	7 Marks
		(OR)		
2	a)	Summarize the features of wireless LANs: 802.11.	CO2	7 Marks
	b)	Explain the components of Wide Area Network with a neat diagram.	CO1	7 Marks

UNIT-II

3	a)	What is the remainder obtained by dividing $\mathbf{x^7+x^5+1}$ by the generator Polynomial $\mathbf{X^3+1}$?	CO4	7 Marks
	b)	Write the services provided by link layer.	CO1	7 Marks
		(OR)		
4	a)	Design a CRC process unit for the following two standard generators of computer networking: i) CRC-12. ii) CRC-16.	CO3	7 Marks
	b)	Assume that 101011010101111 is a block data (D) to be transmitted using the CRC error-checking method. Suppose that the common value of generator, G, is 111010. Using modulo-2 arithmetic. Produce the final value that the transmitter sends on the link (D, CRC).	CO4	7 Marks

UNIT-III

5	a)	List and explain the properties of routing algorithms.	CO1	7 Marks
	b)	Compare IPV4 and IPV6 protocols.	CO2	7 Marks
		(OR)		
6	a)	Explain Classful IP addressing scheme.	CO1	7 Marks
	b)	Sketch the IPv6 packet format.	CO5	7 Marks

UNIT-IV

7	a)	Explain why the client issues an active open for the control connection and a passive open for the data connection.	CO1	7 Marks
	b)	Explain the Features of Transport Layer.	CO1	7 Marks
		(OR)		
8		Sketch the State Transition Diagram of TCP Connection Establishment, Data Transfer and Termination and explain in detail.	CO1	14 Marks

UNIT-V

9		Summarize the architecture and services of electronic mail with suitable scenarios.	CO2	14 Marks
		(OR)		
10	a)	What are the services provided by a User Agent? Explain in detail.	CO1	7 Marks
	b)	Define Multi Purpose Internet Mail Extension and draw Multi Purpose Internet Mail Extension (MIME) header.	CO1	7 Marks

CODE No.: 16BT51202 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations June - 2022

OBJECT ORIENTED ANALYSIS AND DESIGN
[Computer Science and Engineering, Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Illustrate the architecture of software intensive system.	CO1	8 Marks
	b)	Identify different common mechanisms of UML. Explain with example.	CO1	6 Marks
		(OR)		
2	a)	Explain about Rules of UML.	CO1	9 Marks
	b)	Explain about designing a diagram in different levels of abstraction.	CO1	5 Marks
		UNIT-II		
3	a)	Define a package.	CO1	2 Marks
	b)	Explain about standard stereotypes that apply to packages.	CO1	6 Marks
	c)	Model the package diagram for ATM application.	CO4	6 Marks
		(OR)		
4	a)	Design a class diagram for Library management system.	CO5	7 Marks
	b)	How to model logical database schema using class diagram? Model with an example.	CO4	7 Marks
		UNIT-III		
5	a)	Model the sequence diagram that emphasizes establishing a telephone call.	CO3	7 Marks
	b)	List and explain different stereotypes that apply to use case diagram.	CO1	7 Marks
		(OR)		
6	a)	Define Interaction. Specify the context of interaction with examples.	CO1	7 Marks
	b)	Explain an exceptional flow of event in use case diagram.	CO1	7 Marks
		UNIT-IV		
7		Design the swimlane diagram to represent withdrawal scenario of ATM application using fork and Join.	CO3	14 Marks
		(OR)		
8	a)	Define Reactive Object. How to model it using state chart diagram?	CO1	9 Marks
	b)	Explain about history state.	CO1	5 Marks
		UNIT-V		
9	a)	Compare component with class.	CO2	6 Marks
	b)	Enumerate the steps to model source code files using components with an example.	CO4	8 Marks
		(OR)		
10	a)	Design deployment diagram for Mobile phone.	CO5	7 Marks
	b)	Enumerate the steps to model an embedded system.	CO4	7 Marks

CODE No.: 16BT51241 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations June – 2022

OBJECT ORIENTED PROGRAMMING
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What are all the characteristic features of Java Programming language?	CO1	6 Marks
	b)	Compare and contrast visibility controls and also compare with each of them.	CO2	8 Marks
		(OR)		
2	a)	"Java is platform independent". Justify.	CO4	6 Marks
	b)	Compare and contrast Java with C. Explain Constructors with examples.	CO2	8 Marks

UNIT-II

3	a)	Explain the importance of inheritance with the help of an example.	CO1	5 Marks
	b)	What are packages? What are the benefits of creating programs using packaging?	CO1	5 Marks
	c)	How to create an interface? Distinguish between abstract classes and interfaces.	CO1, CO2	4 Marks
		(OR)		
4	a)	How is multiple inheritance achieved in Java?	CO2	3 Marks
	b)	Develop a Library interface which has drawbook(), returnbook() (with fine), checkstatus() and reservebook() methods. All the methods tagged with public.	CO6	11 Marks

UNIT-III

5	a)	Differentiate between exceptions , runtime errors and compile time errors.	CO2	4 Marks
	b)	Differentiate between Thread and Process in Java. How to implement Thread in Java?	CO2	5 Marks
	c)	Develop a java program to read 20 marks and store them in an array. Define your own exception named wrong mark exception. Throw and catch this type of exception when a mark is (<0 and >100).	CO3	5 Marks
		(OR)		
6	a)	When to use Runnable ***vs*** Thread in Java? Difference between start() and run() method of Thread class.	CO2	4 Marks
	b)	Differentiate throw and throws keyword in Java. Can the same exception been declared to be thrown many times by the method? Eg: public void sample() throws IOException, SQLException.	CO1	5 Marks
	c)	Develop a java program for producer consumer problem to illustrate the concept of multithreading.	CO3	5 Marks

UNIT-IV

7	a)	What is an Event? Explain the role of Event handler in AWT.	CO1	5 Marks
	b)	Design and develop an Applet to receive the value of the parameter message from the html file and display it on the webpage.	CO3	9 Marks
		(OR)		
8	a)	What is Java Collections Framework? List out some benefits of Collections framework.	CO1	6 Marks
	b)	Create an anonymous inner class for handling mouse entered event into an Applet.	CO5	8 Marks

UNIT-V

9	a)	List and explain the different situations in which the Action Event is generated. Develop the event handler for the Action Event.	CO2, CO4	10 Marks
	b)	Explain the life cycle methods of a servlet.	CO4	4 Marks
		(OR)		
10	a)	Explain the interfaces and classes in javax.servlet package.	CO5	8 Marks
	b)	Write a servlet which displays current system date and time	CO5	6 Marks

CODE No.: 16BT51501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations June – 2022

COMPILER DESIGN

[Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Give the reasons for separating lexical analysis from syntax analysis. Write Specification of LEX program.	CO5	6 Marks
	b)	Explain with one example how identifiers and keywords are recognized by lexical analyzer.	CO1	8 Marks
		(OR)		
2	a)	Write about machine independent phases of a Compiler Structure.	CO1	7 Marks
	b)	Describe about Interpreters.	CO1	7 Marks
		UNIT-II		
3	a)	Write Recursive Descent Parser for the Grammar S⇒cAd, A→ab/a.	CO3	7 Marks
	b)	Construct Predictive parsing table for the Grammar S→a/#/(T),T→T,S/S.	CO3	7 Marks
		(OR)		
4		Consider the the following grammer. i) S→AS/b. ii) A→SA/a. Construct SLR Parsing Table. Show the actions of parser for the string "abab".	CO3	14 Marks
		UNIT-III		
5	a)	Write short notes on: i) type conversion. ii) type coercion.	CO1	6 Marks
	b)	Define Structural Equivalence of Type Expressions. Write a function which will test the structural equivalence of two type expressions.	CO1	8 Marks
		(OR)		
6		Discuss briefly about type conversions. What is Coercions? The grammar for expressions is given below. Write the semantics rules for Coercions from integer to real. E→num E→num.num E→id E→E1 op E2	CO4	14 Marks
		UNIT-IV		
7	a)	What are the advantages and disadvantages of heap storage allocation strategy?	CO1	7 Marks
	b)	Discuss briefly about overloading of functions and operators with suitable example.	CO1	7 Marks
		(OR)		
8	a)	Explain the parameter passing mechanisms	CO1	7 Marks
	b)	Explain about Activation Record. With example, explain how runtime memory is allocated for objects.	CO6	7 Marks

UNIT-V

9		Explain briefly about loop optimization techniques.	CO2	14 Marks
		(OR)		
10	a)	Write short notes on: i) Redundant sub expression elimination. ii) Induction variable elements.	CO1	7 Marks
	b)	Explain data flow diagram with an example	CO1	7 Marks

CODE No.: 16BT51502 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations June – 2022

SYSTEMS SOFTWARE

[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Compare and contrast differences between UNIX command and windows programs.	CO2	7 Marks
	b)	Describe the role played by kernel and shell in UNIX architecture.	CO1	7 Marks
		(OR)		
2	a)	Write the significance of Universal Mailer.	CO1	6 Marks
	b)	Write about the following UNIX commands with options. i) cat. ii) cp. iii) rm. iv) wc.	CO1	8 Marks

UNIT-II

3		Describe the overview of UNIX File system.	CO1	14 Marks
		(OR)		
4	a)	Write a program that changes its root to a particular directory, and investigate the directory tree accessible to that program.	CO4	7 Marks
	b)	Describe the UNIX File system administration.	CO1	7 Marks

UNIT-III

5	a)	Describe process states and transitions with neat diagram.	CO1	7 Marks
	b)	Discuss about interrupts and exceptions.	CO1	7 Marks
		(OR)		
6	a)	Write an algorithm for invocation of system call.	CO4	7 Marks
	b)	Explain the changing the size of region with an example.	CO1	7 Marks

UNIT-IV

7	a)	Compose a C Program for catching death of child signals.	CO3	7 Marks
	b)	Write an algorithm for handling signals in UNIX.	CO4	7 Marks
		(OR)		
8	a)	Design an algorithm that translates virtual addresses to physical addresses.	CO2	7 Marks
	b)	Write a C program to explain **brk** system call with an example.	CO4	7 Marks

UNIT-V

9	a)	Discuss about Domain Name System.	CO1	7 Marks
	b)	Explain the features of Transmission Control Protocol/Internet Protocol.	CO1	7 Marks
		(OR)		
10	a)	Discuss about file system consistency check (fsck) in UNIX.	CO1	7 Marks
	b)	Write a short note on Partitions in UNIX.	CO5	7 Marks

CODE No.: 16BT60402 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations June – 2022

DIGITAL SIGNAL PROCESSING

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Determine the z-transform the signal $x(n) = (-1)^n \cos\left(\frac{n\pi}{3}\right)u(n)$.	CO2	7 Marks
	b)	Find the DTFT of the sequence $x(n) = \cos(n\pi/3u(n))$.	CO2	7 Marks
		(OR)		
2	a)	Explain the significance of frequency domain representation of discrete time signals and system.	CO4	7 Marks
	b)	Determine the response of discrete time system given by difference $Y(n) = -0.8y(n-1) + x(n)$. When the input is step and $y(-1) = 0$.	CO2	7 Marks

UNIT-II

3	a)	Contrast the transforms DTFT, DFS and DFT.	CO4	7 Marks
	b)	Develop the inverse FFT algorithm with neat sketch for N=8.	CO3	7 Marks
		(OR)		
4	a)	What is DFT? Interpret role of DFT over the DTFT.	CO4	7 Marks
	b)	Develop the DIT FFT algorithm with neat sketch for N=8.	CO3	7 Marks

UNIT-III

5	a)	Compare Direct form-I and Direct Form –II realizations of system described by the difference equation, $y(n) - 4y(n-1) + 4y(n-2) = x(n) - x(n-1) + x(n-3)$.	CO2	7 Marks
	b)	Interpret the advantages and disadvantage bilinear transformation.	CO4	7 Marks
		(OR)		
6	a)	Design a digital Butterworth filter using bilinear transformation. The specifications of the desired LP filter is; $0.9 \le \lvert H(\omega)\rvert \le 1; \quad 0 \le \omega \le \frac{\pi}{2}$ $\lvert H(\omega)\rvert \le 0.2; \quad 3\frac{\pi}{2} \le \omega \le \pi/2$	CO3	7 Marks
	b)	Obtain the Direct form I and Direct form II realizations of the difference equation $y(n) = b_0x(n) + b_1x(n-1) + b_2x(n-2) - a_1y(n-1) - a_2y(n-2)$.	CO2	7 Marks

UNIT-IV

7	a)	Synthesize the characteristics of Rectangular, Bartlet, Blackman window with neat sketch.	CO4	7 Marks
	b)	Design a linear phase FIR lowpass filter with $W_c = 0.5\pi$rad/sample by taking 11 samples of ideal frequency response using frequency sampling method.	CO5	7 Marks
		(OR)		
8	a)	Discuss the fir filter design by using window method.	CO1	7 Marks
	b)	Design a linear phase FIR bandpass filter to pass frequencies in the range 0.4π to 0.6π rad/sample by taking 7 samples of Hanning window.	CO5	7 Marks

UNIT-V

9	a)	Why the P-DSPs have multiple address and data buses for internal memory and peripherals but have only a single address and data bus for external memory and peripherals? Give the reasons.	CO2	7 Marks
	b)	List the relative merits and demerits of RISC and CISC processors.	CO1	7 Marks
		(OR)		
10	a)	Distinguish synchronous and asynchronous mode of operation of serial ports.	CO1	7 Marks
	b)	What is meant by bit reversal address mode? Write the applications for which this addressing mode is preferred.	CO2	7 Marks

CODE No.: 16BT60503 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations June – 2022

WIRELESS NETWORKS
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Discuss about ALOHA-Based Wireless Random Access Techniques.	CO1	8 Marks
	b)	Implement CSMA/CD in MAC Layer.	CO5	6 Marks
		(OR)		
2	a)	Identify and solve the complications caused by Wireless Channel.	CO3	7 Marks
	b)	Write short notes on data Integration in Voice-Oriented Networks.	CO1	7 Marks
		UNIT-II		
3	a)	How to increase the capacity of an analog cellular system without increasing the number of antenna sites?	CO2	7 Marks
	b)	Identify the uses of Reuse partitioning.	CO1	7 Marks
		(OR)		
4		Assume that you have six-sector cells in a hexagonal geometry. Draw the hexagonal grid corresponding to this case. Compute S_r for resuse factors of 7, 4 and 3. Find the results.	CO3	14 Marks
		UNIT-III		
5	a)	What is the 802.11 MAC frame that has the type frame control code of 001000?	CO1	10 Marks
	b)	How transmission techniques of WLAN standards are useful for current data networks?	CO6	4 Marks
		(OR)		
6	a)	How to handle MAC Management sub layer?	CO1	10 Marks
	b)	Define Probe and beacon.	CO1	4 Marks
		UNIT-IV		
7	a)	Examine the concept of Pilot processing of IS-95 CDMA forward channel.	CO2	10 Marks
	b)	Solve the network communications Using seamless handoff.	CO4	4 Marks
		(OR)		
8	a)	Explain the concept of Access channel processing in IS-95.	CO1	10 Marks
	b)	List the needs and uses of CDMA.	CO1	4 Marks
		UNIT-V		
9	a)	What is the Relation between logical and transport channel is HIPERLAN-2?	CO1	10 Marks
	b)	Analyze the Security mechanisms in HIPERLAN-2.	CO2	4 Marks
		(OR)		
10	a)	List the Functional requirements of WPAN.	CO1	7 Marks
	b)	What is Protocol stack for Bluetooth?	CO1	7 Marks

CODE No.: 19BM50501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

ARTIFICIAL INTELLIGENCE

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Discuss the risks and benefits of artificial intelligence.	6 Marks	L2	CO1	PO1
	b)	Explain about the history of Artificial Intelligence.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Explain the foundations and characteristics of Artificial Intelligence.	6 Marks	L2	CO1	PO2
	b)	Differentiate between goal based agents and utility based agents with example.	6 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	Describe uninformed search strategies with examples.	6 Marks	L2	CO2	PO2
	b)	Solve the following problem. The eight queen's problem is the problem of placing eight queens on an 8 x 8 chessboard such that none of them attack one another (no two are in the same row, column, or diagonal).	6 Marks	L3	CO2	PO2
		(OR)				
4.	a)	Analyze and apply heuristic functions with real world problems.	6 Marks	L3	CO2	PO2
	b)	Explain about A* Search algorithm.	6 Marks	L2	CO2	PO2
		UNIT-III				
5.	a)	Explain local beam search with an example.	6 Marks	L2	CO2	PO1
	b)	Explain about the simulated annealing.	6 Marks	L1	CO2	PO1
		(OR)				
6.	a)	Discuss the importance and benefits of using evolutionary algorithms for optimization problems.	6 Marks	L2	CO2	PO2
	b)	Explain about the Minimax algorithm.	6 Marks	L2	CO2	PO2
		UNIT-IV				
7.	a)	Examine the importance of using Hidden Markov models for localization problem in vacuum world considering noise in sensors and random movement of robot.	6 Marks	L2	CO3	PO2
	b)	Explain in detail about rule based methods for uncertain reasoning.	6 Marks	L2	CO3	PO2
		(OR)				
8.	a)	Explain about Dynamic Bayesian networks.	6 Marks	L2	CO3	PO1
	b)	We have a bag of three biased coins a, b, and c with probabilities of coming up heads of 30%, 60%, and 75%, respectively. One coin is drawn randomly from the bag (with equal likelihood of drawing each of the three coins), and then the coin is flipped three times to generate the outcomes X_1, X_2, and X_3. i) Draw the Bayesian network corresponding to this setup and define the necessary CPTs. ii) Calculate which coin was most likely to have been drawn from the bag if the observed flips come out heads twice and tails once.	6 Marks	L3	CO3	PO3

UNIT-V

9.	a)	Discuss the ethics of artificial intelligence and its impact on society.	6 Marks	L2	CO5	PO8
	b)	Explain in detail about robot perception.	6 Marks	L3	CO4	PO6
		(OR)				
10.	a)	Write short note on safety in artificial intelligence.	6 Marks	L2	CO5	PO6
	b)	List some of the prime application domains for robotic technology and explain them.	6 Marks	L2	CO4	PO6

CODE No.: 19BM50503 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

PYTHON FOR DATA SCIENCE

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Write a python program to compute dot product, vector product and inner product using NumPy.	6 Marks	L3	CO1	PO5
	b)	Discuss the steps involved in data science process.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Illustrate the importance of performing arithmetic computations using NumPy with suitable examples.	6 Marks	L2	CO1	PO2
	b)	Write a python program to compute eigenvalues and eigenvectors for a square matrix.	6 Marks	L3	CO1	PO5
		UNIT-II				
3.	a)	Illustrate the importance of using pandas in data exploration process.	6 Marks	L1	CO2	PO2
	b)	Create a Data Frame from List to perform operations like and row selection, addition and deletion.	6 Marks	L3	CO2	PO4
		(OR)				
4.	a)	Describe with suitable examples the data structures used in pandas.	6 Marks	L2	CO2	PO1
	b)	Write a python program to perform different descriptive statistics functions using pandas.	6 Marks	L3	CO2	PO5
		UNIT-III				
5.	a)	Illustrate the importance of using pandas to handle missing data with relevant example.	6 Marks	L2	CO2	PO1
	b)	Write a python code to fill the missing data using fillna function.	6 Marks	L2	CO2	PO1
		(OR)				
6.	a)	Write a python code to split a string with a variable number of whitespace characters (tabs, spaces, and newlines) and get a list of all patterns matching.	6 Marks	L3	CO2	PO4
	b)	Explain vectorized string functions with relevant examples.	6 Marks	L2	CO2	PO1
		UNIT-IV				
7.	a)	Discuss the importance of using seaborn to perform data visualization.	6 Marks	L2	CO3	PO1
	b)	Create horizontal and vertical bar plots using series.	6 Marks	L3	CO3	PO3
		(OR)				
8.	a)	Compare histogram and density plot with example.	6 Marks	L2	CO3	PO2
	b)	Write a python code to create a Line Plot by setting the title, axis labels, annotations on subplots and save to a file.	6 Marks	L3	CO3	PO5
		UNIT-V				
9.	a)	Illustrate the process of converting timestamps to periods and back with suitable example.	6 Marks	L2	CO4	PO2
	b)	Utilize pandas. date_range function to generate a Date time Index with an indicated length.	6 Marks	L3	CO4	PO3

(OR)

10.	a)	Write a python code to generate data ranges and convert to particular time zone.	6 Marks	L3	CO4	PO5
	b)	Examine with example the importance of using moving window functions to automatically exclude missing data.	6 Marks	L4	CO4	PO4

CODE No.: 19BT4BS01 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

MATERIAL SCIENCE

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	List few properties and applications of Biomaterials.	6 Marks	L1	CO1	PO1
	b)	Classify engineering materials based on their properties.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	List few advantages and disadvantages of smart materials.	6 Marks	L1	CO1	PO1
	b)	Distinguish between thermoplastic and thermosetting resins.	6 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	What are composite materials? List out various properties and applications of composites.	6 Marks	L1	CO2	PO1
	b)	Outline the advantages and limitations of nanocomposites.	6 Marks	L2	CO2	PO3
		(OR)				
4.	a)	Distinguish fiber reinforced and particulate reinforced composites.	6 Marks	L2	CO2	PO1
	b)	What are structural composites? Give their classification with relevant examples.	6 Marks	L1	CO2	PO2
		UNIT-III				
5.	a)	Outline the advanced applications of smart material in different technical fields.	6 Marks	L1	CO3	PO4
	b)	What are Shape Memory Alloys (SMA)? Describe the characteristics of SMA'S.	6 Marks	L2	CO3	PO2
		(OR)				
6.	a)	Summarize Electro-rheostatic materials with their applications	6 Marks	L3	CO3	PO3
	b)	What are self healing materials? List any two of them with specific applications.	6 Marks	L1	CO3	PO4
		UNIT-IV				
7.	a)	Using lithographic technique, explain the fabrication of nanomaterials.	8 Marks	L3	CO4	PO3
	b)	Identify the role of nanomaterials in renewable energy.	4 Marks	L1	CO4	PO1
		(OR)				
8.		What are biomimetic materials? Classify biomimetic materials and write their advantages and applications in the modern technology.	12 Marks	L3	CO4	PO2
		UNIT-V				
9.	a)	Summarize the applications of functionally graded materials in optoelectronics.	6 Marks	L1	CO5	PO2
	b)	List various processing techniques of functionally graded materials. Explain any one processing method with a neat sketch.	6 Marks	L2	CO5	PO3
		(OR)				
10.		Define Functionally graded materials. Illustrate the types and applications of functionally graded materials with suitable sketches.	12 Marks	L2	CO5	PO2

❀ ❀ ❀

CODE No.: 19BT4HS01 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

BANKING AND INSURANCE

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

	UNIT-I				
1.	Explain the significance of Banking in Indian Financial System and illustrate the classification of Banks in India.	12 Marks	L3	CO1	PO3
	(OR)				
2.	Analyze, in detail, the role of RBI in sustainable development of the country, with examples.	12 Marks	L3	CO2	PO8
	UNIT-II				
3.	Explain the significance of Banker Customer Relationship and discuss in detail various relationships shared between Banker and Customer.	12 Marks	L3	CO1	PO3
	(OR)				
4.	Discuss various principles of Lending and explain different types of loans offered by Banks.	12 Marks	L3	CO2	PO9
	UNIT-III				
5.	Contrast RTGC ***Vs*** NEFT ***Vs*** IMPS. Discuss in detail.	12 Marks	L3	CO1	PO3
	(OR)				
6.	Compare the features and types of credit cards and debit cards and explain them in detail, with examples.	12 Marks	L3	CO1	PO3
	UNIT-IV				
7.	Contrast Risk *Vs* Uncertainty. Explain in detail with relevant examples.	12 Marks	L3	CO2	PO8
	(OR)				
8.	"Insurance is a means of protection from financial loss. It is a form of risk management, primarily used to hedge against the risk of a contingent or uncertain loss". Examine the significance of the statement and analyze how insurance functions as risk mitigation mechanism. Explain in detail.	12 Marks	L3	CO2	PO9
	UNIT-V				
9.	Explain various types of Insurance and discuss in detail with examples.	12 Marks	L3	CO1	PO3
	(OR)				
10.	Explain in detail, the role and Functions of IRDAI as a regulator for Insurance industry in India.	12 Marks	L3	CO2	PO9

CODE No.: 19BT4HS02 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

BUSINESS COMMUNICATION AND CAREER SKILLS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Write the characteristics of business communication.	6 Marks	L2	CO1	PO1 PO5
	b)	Describe the interpersonal communication.	6 Marks	L3	CO2	PO2
		(OR)				
2.		Explain the functions of communication.	12 Marks	L3	CO1	PO1 PO5
		UNIT-II				
3.	a)	Write about cross-cultural communication.	6 Marks	L2	CO4	PO10
	b)	"Crisis communication is important for organization". Comment.	6 Marks	L4	CO2	PO5
		(OR)				
4.		Describe the corporate communication strategy with an example.	12 Marks	L3	CO2	PO2
		UNIT-III				
5.	a)	Explain the importance of written business communication.	6 Marks	L3	CO1	PO1 PO5
	b)	Write the strategies for writing the body of a letter.	6 Marks	L2	CO3	PO2 PO5
		(OR)				
6.		Explain the various kinds of business letters.	12 Marks	L3	CO3	PO5
		UNIT-IV				
7.	a)	Write a short note on career building.	6 Marks	L2	CO3	PO5
	b)	Explain about follow-up letters.	6 Marks	L3	CO3	PO10
		(OR)				
8.		Distinguish between traditional, electronic and video resumes.	12 Marks	L4	CO3	PO2
		UNIT-V				
9.	a)	Write the different types of interviewing questions.	6 Marks	L3	CO2	PO2
	b)	Describe the importance of non-verbal aspects in an interview.	6 Marks	L3	CO2	PO10
		(OR)				
10.		Explain online recruitment process with an example.	12 Marks	L4	CO2	PO5

CODE No.: 19BT4HS04 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

ENTREPRENEURSHIP FOR MICRO, SMALL AND MEDIUM ENTERPRISES

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

	UNIT-I				
1.	Define the concept growth of entrepreneurship in India.	12 Marks	L1	CO1	PO1
	(OR)				
2.	Briefly explain the characteristics of an entrepreneur.	12 Marks	L2	CO1	PO1
	UNIT-II				
3.	Define idea generation and explain its methods.	12 Marks	L1	CO2	PO2
	(OR)				
4.	Briefly explain the steps in setting up a small business enterprise.	12 Marks	L2	CO2	PO2
	UNIT-III				
5.	Define micro and macro units and explain its essentials.	12 Marks	L1	CO3	PO1
	(OR)				
6.	Briefly explain objectives of micro enterprises.	12 Marks	L2	CO3	PO1
	UNIT-IV				
7.	Define the concept SIDBI.	12 Marks	L1	CO4	PO2
	(OR)				
8.	Define the concept MUDRA.	12 Marks	L1	CO4	PO2
	UNIT-V				
9.	Briefly explain the functions of women entrepreneurs.	12 Marks	L2	CO5	PO1
	(OR)				
10.	Define rural entrepreneurship and explain its need.	12 Marks	L1	CO5	PO1

CODE No.: 19BT4HS05 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

GENDER AND ENVIRONMENT

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		Discuss the relation between gender and environment.	12 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Explain the need for understanding gender and environment relationship.	6 Marks	L2	CO1	PO7
	b)	Define the feminist political ecology.	6 Marks	L2	CO1	PO7
		UNIT-II				
3.		Explain gender ineqality in household chores and conflict between work and family.	12 Marks	L2	CO1	PO6
		(OR)				
4.	a)	Explain the role of women in NGO.	6 Marks	L2	CO1	PO1
	b)	Explain the need of women initiation in environmental decision making.	6 Marks	L2	CO1	PO1
		UNIT-III				
5.		What is the sustainable development? Anaise various dimensions of it.	12 Marks	L4	CO2	PO7
		(OR)				
6.		Write short notes on the following:				
		i) Ecological modernization.	6 Marks	L2	CO2	PO1
		ii) Gender in policy documents.	6 Marks	L2	CO2	PO1
		UNIT-IV				
7.		Elaborate the relation between human rights and gender, and ecological justice.	12 Marks	L4	CO2	PO6
		(OR)				
8.	a)	Explain the strategies to making sense of environmental justice.	6 Marks	L2	CO2	PO1
	b)	Examine the issues addressed in environment movements in recent years.	6 Marks	L2	CO2	PO1
		UNIT-V				
9.		Identify the connections between security and the environment.	12 Marks	L4	CO3	PO7
		(OR)				
10.	a)	Analyse the competing ways of thinking security.	6 Marks	L2	CO3	PO7
	b)	Write short notes on the impacts of natural disasters.	6 Marks	L2	CO3	PO7

CODE No.: 19BT4HS06 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

GERMAN LANGUAGE

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	**Ergäzen Sie: choose the correct answers from the options** 1. Das _____ Trevor Nova. (ist, sind, bist, bin) 2. Er _____ in New York. (wohnen, wohnst, wohnt, wohne) 3. Er _____ aus Johannesburg. (komme, kommen, kommst, kommt) 4. Er _____ Englisch, Xhosa, Zulu, Sotho, Tswana, Tsonga, Afrikaans, und Deutsch. (sprechen, spricht, sprichst, spreche) 5. Seine Hobbys _____ Fußball und Stand-up-comedy. (ist, sind, bist, bin). 6. Er _____ bei Viacom Media Networks.(arbeitest, arbeite, arbeiten, arbeitet)	6 Marks	L1	CO1	PO1
	b)	**Lesen Sie den Dialog. Ergänzen Sie. (ein, ein, eine, / das, der, die) Was ist das? Wie heißt** A : Guten Tag. Fahren Sie mich zum Hotel Michel bitte. B : moin. Hotel Michel, okay. Kennen Sie Hamburg? A : Nein. B : Aha. Na, das ist also der Bahnhof. Er ist über 100 Jahre alt. A : Ah ja. B : Und das hier ist die Kunsthalle. Das ist ein großes Museum. A : Interessant. Und wie heißt der See? B : Das? Das hier ist kein See, das ist ein Fluss: Der Fluss heißt Alster. A : ach so. Und was ist das? Ist das eine kirche? B : Nein, das ist das Rathaus. A : Ah ja. B : Aber das ist eine Kirche. Das ist die Michaeliskirche. Wir sagen „der Michel“. Da vorne ist die Winckler Straße. Da ist das Hotel. A : Ah, sehr schön. 1. Ist das ..... Hotel? Ja, ...2..... 3. Ist das ..... Fluss? Ja, ...4..... 5. Ist das ..... Kirche? Ja, ...6.....	6 Marks	L1	CO2	PO1
		(OR)				
2.	a)	**Ergänzen Sie die Fragen. Ordnen Sie dann die Antworten zu.**	9 Marks	L2	CO2	PO1

1.	_____ heißt du?	a.	Ich bin Lehrerin.
2.	_____ Kommt Flavio?	b.	Mein Name ist Tom.
3.	_____ geht es Ihnen?	c.	Bauer, Siegfried Bauer.
4.	_____ sind Sie von Beruf?	d.	Er kommt aus Italien.
5.	_____ ist Frau Hahn von Beruf?	e.	Sie ist Flugbegleiterin.
6.	_____ heißen Sie?	f.	Danke, gut. Und Ihnen?
7.	_____ ist Herr Born von Beruf?	g.	Gut, und dir?
8.	Hallo, Paul, _____ geht's?	h.	Er ist Pilot.
9.	_____ kommt Frau Wang?	i.	Sie kommt aus China.

b) **Geschäfte. Wie heißen die Wörter richtig?Notieren Sie die Wörter mit Artikel.** 3 Marks L1 CO2 PO1

1. IEREGZTEM _____
2. TKRAM_____
3. IEREKC_____

UNIT-II

3. **Schreiben Sie die wochentage und Jahreszeiten in Deutsch.** 12 Marks L2 CO3 PO1

(OR)

4. a) **Ergänzen Sie die mit (bin – bist – ist – sind - seid)** 6 Marks L2 CO2 PO1

Mein Name .....1... Müller. Wer ...2....Sie? Ich ....3... Fräulein Klein. Ich....4... hier Sekretärin. Herr Weber ....5... Techniker. Er ....6...sehr nett. Wo....7... Herr Hartmann? Er .....8...verreist. Morgen...9.. er wieder zurück. Hallo Anna, wo ...10...du? Ich ....11...in Köln. Und wo ...12.....

b) **Wie viel ist das?** 6 Marks L1 CO1 PO1

1. Drei + neun + vier = ...
2. Sieben + sechsundzwanzig – vier =.....
3. Sechzehn + elf – fuenf =.....
4. Achtundachtzig + neunzehn + eins =.....
5. Siebzig + vierunfuenzig + zwei = ...
6. Sechzehn + Siebzehn+ neun= .....

UNIT-III

5. **Das ist …" Schreiben Sie Sätze.** 12 Marks L2 CO3 PO10

Beispel : Der computer: Das ist mein Computer.

1. Die Autos (plural):.....
2. Die Familie:.....
3. Der Fernseher:.....
4. Das Haus:.....
5. Das Flugezug:.....
6. Der Teppich:.....

(OR)

6. **Bilden Sie Fragen (wer – was - wie)** 12 Marks L2 CO3 PO10

1.	.....?	a.	Das ist Herr Weber.
2.	.....?	b.	Er ist Techniker.
3.	.....?	c.	Das ist Fräulein Klein.
4.	.....?	d.	Sie ist Sekretärin.
5.	.....?	e.	Sie ist sehr nett.
6.	.....?	f.	Das sind Herr und Frau Hartmann.
7.	.....?	g.	Frau Hartmann ist Lehrerin.
8.	.....?	h.	Fräulein Ito ist Studentin.
9.	.....?	i.	Sie ist sehr freundlich.
10.	.....?	j.	Ich bin Heinz Müller, Ihr Lehrer.
11.	.....?	k.	Das ist Frau Schmitt.
12.	.....?	l.	Sie ist nett und freundlich.

UNIT-IV

7. a) **Ergänzen Sie den passenden Possessivartikel.** 6 Marks L2 CO3 PO10

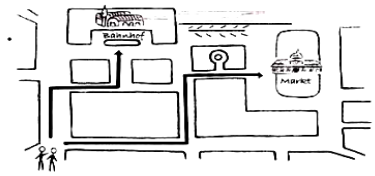
1. Ist das _____ Hund?
2. Nein, das ist _____Hund.
3. Ist das _____ Buch?
4. Ja, das ist _____Buch. Vielen Dank!
5. Ist das _____Auto?
6. Nein, das ist _____Auto.

b) **Wie heißen die Sätze richtig? Notieren Sie.** 6 Marks L2 CO3 PO10

1. Bitte / ich / Entschuldigung / um
2. Leid / tut/ mir /es
3. Gut / schon.
4. Sie / entschuldiegnen / bitte
5. Nichts / macht
6. Heißen / wie / sie

(OR)

8. **Sprechen Sie mit einem Partner / einer Partnerin.** 12 Marks L1 CO4 PO1

i) Fragt nach dem Weg zum Bahnhof. ii) Fragt nach dem Weg zum Markt.	

UNIT-V

9. a) **Das Grillfest. Was sagen Sie? Ordnen Sie zu.** 6 Marks L2 CO2 PO1

b) **Wer macht/kauft was? Was fehlt? Schreiben Sie Sätze.** 6 Marks L2 CO4 PO10

Grillparty am Samstag

Wir brauchen:
Brot und Brötchen,
Salat, Nudelsalat,
Kartoffelsalat, Käse,
Gemüse (kann man grillen ☺),
Oliven, Schinken,
Würstchen, Fleisch,
Kuchen, Obstsalat,
Orangensaft, Cola, Limonade,
Bier, Wasser

Wer	Was
Thomas Frisch	Brot, Bier
Markus Huber	Kuchen, Würstchen
Familie Schulz	Kartoffelsalat und Limonade
Hella Kübler	*Obstsalat*
Frau Mühltal	*Nudelsalat und Fleisch*

(OR)

10. **Lesen Sie den Text Und antworten Sie:** 12 Marks L2 CO4 PO10

EXPO ist eine Exportfirma. Sie exportiert Maschinen und Apparate in viele Länder. Herr Hartmann ist ihr Chef. Er ist oft nicht da, sondern verreist Termine und schreibt Briefe.
Herr Meier ist Ingenieur. „ Ist das Ihr Büro, Herr Meier?“ – „Ja, das ist mein Büro.“ Herr Weber ist Techniker. Er arbeitet oft im Ausland. Günter ist 17 Jahre alt und in Ausbildung. Her Meier ist sein Ausbilder. Günter wird Elektriker. Er lernt noch ein Jahr und macht dann eine Prüfung. Dann ist er Elektriker.

1. Was ist EXPO?
2. Was exportiert sie?
3. Was ist Fräulein Klein?
4. Wer ist ihr Chef?
5. Was macht Fräulein Klein?
6. Wo arbeitet Herr Weber?

CODE No.: 19BT4HS07 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

INDIAN ECONOMY

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering,]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

	UNIT-I				
1.	Define Engineering Economics. Explain the concept and scope of Engineering Economics.	12 Marks	L2	CO1	PO1
	(OR)				
2.	Compare and contrast between Micro and Macro Economics.	12 Marks	L2	CO2	PO1
	UNIT-II				
3.	Examine the importance of material selection of a product.	12 Marks	L2	CO1	PO6
	(OR)				
4.	Outline the Process modification.	12 Marks	L2	CO1	PO6
	UNIT-III				
5.	What is the need for planning in India? Examine the role of NITI Ayog.	12 Marks	L2	CO1	PO6
	(OR)				
6.	Examine the role of engineers in employment and inclusive growth in India.	12 Marks	L2	CO1	PO6
	UNIT-IV				
7.	Define capital budgeting. Explain the traditional methods of capital budgeting.	12 Marks	L2	CO2	PO12
	(OR)				
8.	What is Depreciation Policy? Explain the Straight Line and Declining Balancing Methods.	12 Marks	L2	CO2	PO1
	UNIT-V				
9.	Explain the functions and aims of value analysis.	12 Marks	L2	CO2	PO12
	(OR)				
10.	Explain the procedure of value engineering in detail.	12 Marks	L2	CO1	PO1

CODE No.: 19BT4HS08 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

INDIAN HISTORY

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

	UNIT-I				
1.	Explain archaeological sources of History with relevant examples.	12 Marks	L2	CO1	PO1
	(OR)				
2.	Discuss the types of Marriages and its functions.	12 Marks	L2	CO1	PO1
	UNIT-II				
3.	Analyse the reasons for the decline of the Indus Valley Civilization.	12 Marks	L2	CO1	PO1
	(OR)				
4.	Explain the main features of the Indus valley civilization.	12 Marks	L2	CO1	PO1
	UNIT-III				
5.	Describe the administration of the Satavahana dynasty.	12 Marks	L2	CO1	PO1
	(OR)				
6.	Describe the cultural achievements of the Post-Mauryan period.	12 Marks	L2	CO1	PO1
	UNIT-IV				
7.	"Krishnadevaraya 1509- 1529 AD the King of Vijayanagara, was not only an accomplished scholar himself, but was also a great patron of learning and literature. Discuss."	12 Marks	L2	CO2	PO6
	(OR)				
8.	Analyze the social and Economic conditions on the eve of British rule (18th century) in India.	12 Marks	L2	CO2	PO6
	UNIT-V				
9.	Examine the causes for the first war of Independence (1857).	12 Marks	L2	CO2	PO6
	(OR)				
10.	Explain the various the provisions of Indian constitution.	12 Marks	L2	CO2	PO6

CODE No.: 19BT4HS09 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

LIFE SKILLS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Describe attitude in a work place.	6 Marks	L3	CO1	PO1
	b)	Detail the way of measuring attitude.	6 Marks	L4	CO1	PO1
		(OR)				
2.		Enlist the mechanism of developing positive attitude.	12 Marks	L2	CO1	PO2
		UNIT-II				
3.		Examine the elements of attitude in interpersonal relationship.	12 Marks	L4	CO3	PO2
		(OR)				
4.	a)	What is meant by SWOT analysis?	6 Marks	L1	CO2	PO2
	b)	Why is it important to know about yourself?	6 Marks	L1	CO3	PO1
		UNIT-III				
5.		What are the potential hot spots in cross-cultural communication?	12 Marks	L4	CO3	PO10
		(OR)				
6.	a)	List out different styles of communication.	6 Marks	L3	CO3	PO2
	b)	Write down the basic tips for cross-cultural communication.	6 Marks	L3	CO3	PO2
		UNIT-IV				
7.	a)	What are the stages of problem solving?	6 Marks	L1	CO2	PO2
	b)	What are the different categories of thinking?	6 Marks	L1	CO2	PO5
		(OR)				
8.		Enlist different types of decision making.	12 Marks	L2	CO2	PO10
		UNIT-V				
9.		Detail the structuring and delivery of sales presentations.	12 Marks	L3	CO3	PO5
		(OR)				
10.	a)	Mention the guidelines for delivery.	6 Marks	L1	CO3	PO1
	b)	What are the key components of a presentation?	6 Marks	L1	CO3	PO2

CODE No.: 19BT4HS10 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

PERSONALITY DEVELOPMENT

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		What is personality? Explain about different Personalities.	12 Marks	L2	CO2	PO1
		(OR)				
2.	a)	Explain Freudian Analysis.	6 Marks	L2	CO2	PO1
	b)	Explain Leadership qualities.	6 Marks	L2	CO2	PO1
		UNIT-II				
3.		Illustrate how to turn failure into success.	12 Marks	L2	CO1	PO2
		(OR)				
4.	a)	Explain how to build self-confidence.	6 Marks	L1	CO1	PO1
	b)	Discuss the role of monitoring in personality development.	6 Marks	L2	CO3	PO2
		UNIT-III				
5.		Explain the importance of attitude in personality development.	12 Marks	L2	CO2	PO2
		(OR)				
6.	a)	How to change negative attitude? Discuss.	6 Marks	L2	CO1	PO1
	b)	What are internships? Give examples.	6 Marks	L1	CO1	PO1
		UNIT-IV				
7.		Describe the Positive and Negative traits impact on communication.	12 Marks	L2	CO1	PO10
		(OR)				
8.	a)	Discuss open communication with examples.	6 Marks	L2	CO1	PO1
	b)	Discuss Voice mail with suitable examples.	6 Marks	L2	CO1	PO1
		UNIT-V				
9.		Explain how to balance Life and Work.	12 Marks	L2	CO4	PO5
		(OR)				
10.	a)	Discuss how to develop creativity.	6 Marks	L2	CO3	PO1
	b)	Discuss the importance of decision-making.	6 Marks	L1	CO2	PO1

CODE No.: 19BT4HS11 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

PROFESSIONAL ETHICS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Write the scope and aim of engineering ethics.	6 Marks	L2	CO1	PO1
	b)	Explain the variety of moral issues.	6 Marks	L3	CO1	PO1
		(OR)				
2.		What is Gilligan's theory? Explain it with an example.	12 Marks	L4	CO1	PO1
		UNIT-II				
3.	a)	Explain about of professional responsibility.	6 Marks	L3	CO3	PO1 PO5
	b)	What is integrity? Write its importance.	6 Marks	L2	CO3	PO1 PO5
		(OR)				
4.		Explain briefly about use of ethical theories.	12 Marks	L4	CO3	PO1 PO5
		UNIT-III				
5.	a)	"Engineers as responsible experimenters". Comment.	6 Marks	L4	CO2	PO2 PO5
	b)	Write about industrial standards in detail.	6 Marks	L3	CO2	PO2 PO5
		(OR)				
6.		Discuss briefly about code of ethics and limitations.	12 Marks	L3	CO2	PO2 PO5
		UNIT-IV				
7.	a)	Explain about conflict of interests.	6 Marks	L3	CO1	PO1
	b)	What is occupational crime? Explain it in detail.	6 Marks	L2	CO1	PO1
		(OR)				
8.		Explain in detail about employee rights and discrimination.	12 Marks	L3	CO1	PO1
		UNIT-V				
9.	a)	Write a short note on multinational corporations.	6 Marks	L3	CO2	PO2 PO5
	b)	Write the importance of computer ethics.	6 Marks	L2	CO2	PO2 PO5
		(OR)				
10.		Explain about engineers as consultants with example.	12 Marks	L3	CO2	PO2 PO5

❀ ❀ ❀

CODE No.: 19BT4HS12 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

WOMEN EMPOWERMENT

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		Analyze the five levels of equality of women and their framework.	12 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Explain the nature and scope of women empowerment in India.	6 Marks	L2	CO1	PO1
	b)	Discuss the importance of women's participation in decision making.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.		Examine various laws that are discriminatory towards women in India and asses any two systems of Indian personal law in this light.	12 Marks	L4	CO1	PO6
		(OR)				
4.	a)	Give an account on role of women leaders.	6 Marks	L2	CO1	PO6
	b)	Discuss the role of media in empowering women in India.	6 Marks	L2	CO1	PO6
		UNIT-III				
5.		What are the strategies to overcome barriers to be an effective woman employee in the workplace?	12 Marks	L2	CO2	PO6
		(OR)				
6.	a)	Critically analyze the appropriate technology for women characteristics.	6 Marks	L3	CO2	PO1
	b)	Discuss the impact of technological change on work participation of rural women.	6 Marks	L3	CO2	PO1
		UNIT-IV				
7.		Discuss various constraints for participatory development from rural women's point of view.	12 Marks	L2	CO3	PO1
		(OR)				
8.	a)	Define 'Participatory Development'. Discuss its limitations.	6 Marks	L2	CO3	PO10
	b)	Explain the new issues identified by the women in participatory development.	6 Marks	L1	CO3	PO10
		UNIT-V				
9.		Explain the factors that affecting entrepreneurial growth of Women.	12 Marks	L4	CO4	PO1
		(OR)				
10.	a)	Discuss the role of women entrepreneurs and the problems faced by them in India.	6 Marks	L3	CO4	PO1
	b)	Explain the role of financial institutions in women entrepreneurial activities.	6 Marks	L3	CO4	PO11

CODE No.: 19BT4HS14 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

CONSTITUTION OF INDIA

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Explain the following terms:				
		i) Sovereignty.	6 Marks	L2	CO1	PO1
		ii) Fraternity and secularism.	6 Marks	L2	CO1	PO1
		(OR)				
2.		Is preamble an integral part of the Constitution? Explain with proper reasons and scholarly observations.	12 Marks	L2	CO2	PO1

UNIT-II

3.	a)	Give an account of the process of legislation.	6 Marks	L1	CO1	PO1
	b)	Write on the constitutional amendment procedure.	6 Marks	L2	CO2	PO1
		(OR)				
4.		Is the president of India a rubber stamp? Analyze his powers and functions with reference to constitutional provisions.	12 Marks	L2	CO1	PO1

UNIT-III

5.	a)	Explain the powers of election commission of India.	6 Marks	L2	CO1	PO1
	b)	Examine the appointment method of the Governor.	6 Marks	L3	CO1	PO1
		(OR)				
6.		Critically evaluate the administrative relations of centre-states.	12 Marks	L4	CO1	PO1

UNIT-IV

7.	a)	Present a case for fundamental duties.	6 Marks	L2	CO2	PO1
	b)	Explain the original and appellate jurisdiction of Supreme Court.	6 Marks	L2	CO1	PO1
		(OR)				
8.		Discuss the importance, allocation and cadres of All India Services.	12 Marks	L4	CO1	PO1

UNIT-V

9.	a)	Mention the functions of BRICS.	6 Marks	L2	CO1	PO1
	b)	Write on the working of UNEP.	6 Marks	L2	CO1	PO1
		(OR)				
10		Discuss the important aspects of India's foreign policy.	12 Marks	L2	CO1	PO1

.

CODE No.: 19BT21501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Describe the relationship between an object and its defining class.	6 Marks	L1	CO1	PO1
	b)	Explain about JIT compiler and what is the significance of byte code.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	What features of java makes it platform independence and portable?	6 Marks	L1	CO1	PO1
	b)	What are the drawbacks of procedural languages and explain the need of object-oriented programming?	6 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Write a java program that reads thee numbers and display their average.	6 Marks	L1	CO1	PO3
	b)	Develop a recursive function to reverse a given number.	6 Marks	L3	CO2	PO3
		(OR)				
4.	a)	Write a java program to calculate area of circle.	6 Marks	L1	CO1	PO1
	b)	List the conventions for naming variables, methods and classes.	6 Marks	L3	CO1	PO1
		UNIT-III				
5.	a)	Design a program to demonstrate multiple inheritance in java.	6 Marks	L3	CO2	PO1
	b)	What are the various uses of final keyword?	6 Marks	L1	CO2	PO1
		(OR)				
6.	a)	What is inheritance and what are various types of inheritance?	6 Marks	L3	CO2	PO4
	b)	What is a package? How to create your own package?	6 Marks	L2	CO2	PO2
		UNIT-IV				
7.	a)	What is an Array List? Give the various constructors of Array List.	6 Marks	L1	CO2	PO2
	b)	Explain user defined exception handling with suitable program.	6 Marks	L1	CO2	PO2
		(OR)				
8.	a)	What is the difference between thread and process and how to achieve thread synchronization?	6 Marks	L2	CO2	PO1
	b)	What is a linked list? What are the various constructors of Linked List?	6 Marks	L2	CO2	PO1
		UNIT-V				
9.	a)	What is an applet and give the life cycle of an applet?	6 Marks	L1	CO3	PO1
	b)	Explain various components in swing.	6 Marks	L1	CO3	PO1
		(OR)				
10.	a)	Develop an applet which displays your college name.	6 Marks	L2	CO3	PO1
	b)	What are the various layout managers used in Java?	6 Marks	L1	CO3	PO1

CODE No.: 19BT40106 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

DISASTER MITIGATION AND MANAGEMENT

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss the disaster profile of India.	6 Marks	L4	CO1	PO1 PO2 PO5
	b)	Discuss disaster impact on Infrastructure and development.	6 Marks	L4	CO1	PO1 PO2 PO8
		(OR)				
2.		Explain the various disasters affecting the environment.	12 Marks	L4	CO1	PO1 PO2 PO5 PO8

UNIT-II

3.	a)	In what Zones earthquakes occur in India? Explain the reason why it occurs in those Zones.	6 Marks	L4	CO1	PO1 PO2
	b)	What is meant by rehabilitation and explain the rehabilitation measures to be taken after earthquakes.	6 Marks	L4	CO2	PO1 PO2 PO3 PO4
		(OR)				
4.		Explain both pre and post disaster measures undertaken to mitigate the sufferings of people in an earthquake situation.	12 Marks	L4	CO2	PO1 PO2 PO3 PO4

UNIT-III

5.		Describe the areas of flood hazard in India. What causes floods?	12 Marks	L4	CO3	PO1 PO2 PO6 PO10
		(OR)				
6.	a)	How is environmental hazard linked to ecology? Explain with respect to Drought.	6 Marks	L6	CO3	PO1 PO2 PO6 PO10
	b)	Drought and floods occur in the same region but at different times. Explain the reason.	6 Marks	L6	CO3	PO1 PO2 PO6 PO10

UNIT-IV

7.		Describe the measures taken during a land slide disaster.	12 Marks	L4	CO3	PO1 PO2 PO5 PO6
		(OR)				
8.		What pre disaster measures would have reduced the impact of land slide disaster? Explain.	12 Marks	L4	CO4	PO1 PO2

UNIT-V

9.	a)	Explain the various approaches in the disaster management.	6 Marks	L4	CO4	PO1 PO2 PO10
	b)	Discuss ecological and sustainable development models for disaster management.	6 Marks	L5	CO5	PO1 PO3 PO11
		(OR)				
10.	a)	Response is the first stage of the disaster management cycle. Discuss.	6 Marks	L4	CO5	PO1 PO3 PO11
	b)	Discuss in brief the Disaster Management Act 2005.	6 Marks	L5	CO5	PO1 PO3 PO11

CODE No.: 19BT40107 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

SUSTAINABLE ENGINEERING

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Discuss in detail the challenges in sustainable development in India .suggest a way to overcome it.	6 Marks	L4	CO1	PO1 PO2 PO4 PO7
	b)	Explain the availability and depletion on natural resources and discuss how to reduce the wastage of natural resources.	6 Marks	L4	CO1	PO1 PO2 PO4 PO7
		(OR)				
2.	a)	Explain about the project under CDM under that could be executed in developing a village.	6 Marks	L4	CO1	PO2 PO4 PO5
	b)	List out the objectives of Kyoto protocol and discuss the present status in achieving the goals.	6 Marks	L2	CO1	PO2 PO4 PO5
		UNIT-II				
3.	a)	Explain sustainability indicators, metrics and assessment tools in detail.	6 Marks	L3	CO2	PO1 PO4 PO5
	b)	Highlight on life cycle assessment procedure for any building materials.	6 Marks	L2	CO2	PO1 PO4 PO5
		(OR)				
4.	a)	Explain the role of economic input output life cycle analysis which helps in achieving sustainability.	6 Marks	L2	CO2	PO1 PO4 PO5
	b)	Discuss in detail the steps involved in environmental health risk assessment.	6 Marks	L2	CO2	PO1 PO4 PO5
		UNIT-III				
5.	a)	Discuss the measurable metrics relating to municipal solid waste management by focusing on sustainable waste management.	6 Marks	L4	CO3	PO1 PO2 PO4 PO6 PO7
	b)	In a green building suggest two design solutions to effect passive cooling during summer months in order to reduce the total energy requirements.	6 Marks	L4	CO3	PO1 PO2 PO4 PO6 PO7

(OR)

6.	a)	Suggest any two water conservation methods that can be adopted in green buildings.	6 Marks	L4	CO3	PO2 PO5 PO6
	b)	Explain the sustainable remediation of contaminated site with the help of a case study.	6 Marks	L3	CO3	PO2 PO5 PO6

UNIT-IV

7.		Discuss the process of devise selection criteria for the materials of any infrastructure engineering project to attain an environmental sustainability.	12 Marks	L4	CO4	PO1 PO2 PO4 PO5 PO6

(OR)

8.		Explain the criteria of devise selection for the materials of any dam construction project in attaining economic sustainability.	12 Marks	L3	CO4	PO1 PO2 PO4 PO5

UNIT-V

9.	a)	Discuss in detail the prominent causes of urbanization.	6 Marks	L4	CO5	PO4 PO5 PO6 PO7
	b)	Explain any two urban problems affecting sustainability encountered by MEDCs by Listing out all the problems associated with it.	6 Marks	L3	CO5	PO4 PO5 PO6 PO7

(OR)

10.	a)	Highlight on urbanization to growing ground water scarcity in our country and suggest the measures to overcome the water scarcity.	6 Marks	L4	CO5	PO4 PO5 PO6 PO7
	b)	List out three air pollutants that effect human health and discuss control techniques for such air pollutants.	6 Marks	L3	CO5	PO4 PO5 PO6 PO7

CODE No.: 19BT40307 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

MANAGEMENT SCIENCE

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain decision-making concepts in management.	6 Marks	L2	CO1	PO1 PO2
	b)	What are the challenges for management in a global environment?	6 Marks	L2	CO1	PO1 PO2
		(OR)				
2.	a)	Differentiate between process and customer orientation.	6 Marks	L2	CO1	PO1 PO2
	b)	Write short notes on value chain.	6 Marks	L2	CO1	PO1 PO2
		UNIT-II				
3.	a)	What is meant by the human resource information system? Give some examples.	6 Marks	L1	CO2	PO1 PO2
	b)	Write a short note on compensation management.	6 Marks	L3	CO2	PO1 PO2
		(OR)				
4.		Discuss human resource changes in the present scenario. What are the functions of human resource Management?	12 Marks	L2	CO2	PO1 PO2
		UNIT-III				
5.	a)	What are the benefits of supply chain management?	6 Marks	L3	CO3	PO1 PO2
	b)	Explain the line balancing concept with an example.	6 Marks	L3	CO3	PO1 PO2
		(OR)				
6.	a)	Explain make or buy decision with a suitable example.	6 Marks	L2	CO3	PO1 PO2
	b)	Write short notes about the six sigma.	6 Marks	L2	CO3	PO1 PO2
		UNIT-IV				
7.		What is Marketing strategy formulation? Discuss various components of the marketing plan.	12 Marks	L3	CO4	PO1 PO2
		(OR)				
8.	a)	Discuss segmenting and targeting markets with suitable examples.	6 Marks	L2	CO4	PO1 PO2
	b)	Explain the difference between positioning and differentiation with suitable examples.	6 Marks	L2	CO4	PO1 PO2

UNIT-V

9.	a)	What is meant by a work breakdown structure? Give some examples.	6 Marks	L4	CO5	PO1 PO2 PO3 PO4 PO11
	b)	Explain the Gantt chart with an example.	6 Marks	L4	CO5	PO1 PO2 PO3 PO4 PO11

(OR)

10.		Given the following data of the following activities in the given table. i) Draw the project network. ii) Determine the critical path. iii) Determine the earliest start time and earliest finish time.	12 Marks	L4	CO5	PO1 PO2 PO3 PO4 PO11

Activity	Immediate Predecessors	Estimated Completion Time (days)
A. Complete design	-	3
B. Manufacture prototype	A	4
C. Test and redesign cap	B	7
D. Determine interest in product	B	8
E. Design packaging	C	8
F. Manufacture limited quantities	C	30
G. Apply for patent	C	15
H. Negotiate with manufacturers	D,G,F	11
I. Sign contract	H	20
J- Ship initial supplies	E, I	6

CODE No.: 19BT40403 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

LINEAR AND DIGITAL IC APPLICATIONS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Discuss the working of a monostablemultivibrator using 555 IC and explain its design.	6 Marks	L1	CO1	PO3
	b)	Derive the expression for the output frequency of an RC phase shift oscillator.	6 Marks	L3	CO1	PO8
		(OR)				
2.	a)	Explain the operation of VCO IC 566 with the help of block schematic.	6 Marks	L1	CO1	PO2
	b)	Describe with diagram, the working principle of an instrumentation amplifier.	6 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	Design a first order low pass filter for high cutoff frequency of 2kHz and pass band gain of 2.	6 Marks	L5	CO2	PO3
	b)	Derive the cutoff frequency in a second order filter.	6 Marks	L3	CO2	PO3
		(OR)				
4.	a)	Explain the important specifications of A/D and D/A converters.	6 Marks	L1	CO3	PO2
	b)	What output voltage would be produced by a DAC controller whose o/p range is 0 to 10 V and whose input binary number is: i) 0110 (4 bit DAC). ii) 10111100 (8 bit DAC).	6 Marks	L3	CO3	PO2
		UNIT-III				
5.	a)	Model the design flow of VHDL program with front-end and back-end steps.	6 Marks	L3	CO4	PO2
	b)	Define and explain the following terms relevant to Verilog HDL language elements. i) White space characters. ii) Comments. iii) Exercises.	6 Marks	L1	CO4	PO2
		(OR)				
6.	a)	Describe the following relevant to gate level modelling with necessary syntax and example. i) Gate delays. ii) Array of instances.	6 Marks	L2	CO4	PO2
	b)	Explain different levels of design description in Verilog HDL programing.	6 Marks	L1	CO4	PO2
		UNIT-IV				
7.		Construct 12-bit comparator using 74 x 85's and write a VHDL program for comparing 8-bit unsigned.	12 Marks	L3	CO5	PO1
		(OR)				
8.		Design a 16-bit barrel shifter using 74 x 151 that performs right circular shift operation. Demonstrate the Circuit using VHDL program.	12 Marks	L4	CO5	PO1

UNIT-V

9.	Designa JK flip flop using NAND gate and write verilog code for it. Also design a T-flipflop using NAND gates.	12 Marks	L5	CO5	PO3
	(OR)				
10.	Design positive edge triggered D flip-flop and explain its functional and timing behavior. Also develop a VHDL program.	12 Marks	L5	CO5	PO6

CODE No.: 19BT40501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

COMPUTER NETWORKS

[Electronics and Communication Engineering, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Sktech the ISO - OSI Reference Model and explain the functionalities of the layers present in that model.	6 Marks	L2	CO1	PO2
	b)	Differentiate between Connection oriented and Connection less services.	6 Marks	L3	CO1	PO1
		(OR)				
2.	a)	Compare and contrast ISO-OSI Reference model and TCP/IP model.	6 Marks	L3	CO1	PO2
	b)	Write short notes on : i) Twisted pair. ii) Coaxial cable. iii) Fiber optics.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Perform Cyclic Redundancy Check (CRC) for the frame 1101011011 using the Generator polynomial x4 + x + 1 and compute whether the frame is error free or not for the given generator polynomial.	6 Marks	L1	CO2	PO2
	b)	Illustrate the working of Go Back N Sliding window protocol with relevant example.	6 Marks	L3	CO2	PO2
		(OR)				
4.	a)	Elucidate the CSMA Protocols.	6 Marks	L2	CO2	PO1
	b)	Explain a protocol using Selective Repeat with figures.	6 Marks	L3	CO2	PO2
		UNIT-III				
5.		Elaborate the distance vector routing algorithm with an example.	12 Marks	L3	CO3	PO8
		(OR)				
6.	a)	Describe load shedding and jitter control in detail.	6 Marks	L1	CO3	PO1
	b)	Describe Internet Control Message Protocol and Address Resolution Protocol.	6 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	Illustrate the UDP with relevant figure.	6 Marks	L3	CO4	PO4
	b)	Describe TCP segment header in detail.	6 Marks	L3	CO4	PO2
		(OR)				
8.	a)	Explain the connection release procedure of transport layer	6 Marks	L3	CO4	PO4
	b)	Describe the flow control procedure for transport layer	6 Marks	L2	CO4	PO1
		UNIT-V				
9.	a)	Explain various message formats of electronic mail.	6 Marks	L3	CO5	PO6
	b)	Draw and explain various parts of the web model.	6 Marks	L3	CO5	PO6
		(OR)				
10.	a)	What is DNS? Explain in detail.	6 Marks	L2	CO5	PO6
	b)	Explain in detail about SNMP.	6 Marks	L3	CO5	PO6

CODE No.: 19BT40503 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

DESIGN AND ANALYSIS OF ALGORTIHMS

[Information Technology]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Describe the Pseudo code conventions for specifying algorithms of recursive and an iterative algorithm to compute **n**!.	6 Marks	L1	CO1	PO1
	b)	Estimate the time complexity using f(n) and g(n) functions in asymptotic notations.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	What is the importance of random variable in probabilistic analysis? Explain.	6 Marks	L2	CO1	PO1
	b)	Discuss the importance of Space and Time complexities.	6 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Explain the Find algorithm with collapsing rule.	6 Marks	L2	CO2	PO2
	b)	Write the General method of Divide – And – Conquer approach.	6 Marks	L1	CO2	PO2
		(OR)				
4.	a)	What is weighting rule for Union (i, j)? How it improves the performance of union operation?	6 Marks	L2	CO2	PO4
	b)	Perform binary search on list of elements to find the key element using divide and conquer, and also estimate the time complexity.	6 Marks	L3	CO2	PO3
		UNIT-III				
5.	a)	Define merging and purging rules in 0/1 knapsack problem.	6 Marks	L1	CO3	PO2
	b)	Explain how Matrix–chain Multiplication problem can be solved using dynamic programming with suitable example.	6 Marks	L3	CO3	PO3
		(OR)				
6.	a)	Discuss Flow shop scheduling with an example.	6 Marks	L1	CO3	PO4
	b)	Explain the methodology of Dynamic programming. List the applications of Dynamic programming.	6 Marks	L2	CO3	PO2
		UNIT-IV				
7.	a)	Discuss briefly about the minimum cost spanning tree.	6 Marks	L2	CO3	PO2
	b)	Discuss the 4 – queen's problem. Draw the portion of the state space tree for n = 4 queens using backtracking algorithm.	6 Marks	L6	CO3	PO3
		(OR)				
8.	a)	State the Greedy Knapsack. Find an optimal solution to the Knapsack instance n=3, m=20, $(P_1, P_2, P_3) = (25, 24, 15)$ and $(W_1, W_2, W_3) = (18, 15, 10)$.	6 Marks	L3	CO3	PO3
	b)	Write the backtracking algorithm for the sum of subsets problem using the state space tree corresponding to m=35, w = (20, 18, 15, 12, 10, 7, 5).	6 Marks	L1	CO3	PO4

UNIT-V

9.		Obtain reduced cost matrix for travelling sales person problem. Consider the instance define by the cost matrix: $\begin{bmatrix} \infty & 5 & 1 & 10 & 6 \\ 1 & \infty & 4 & 12 & 7 \\ 3 & 6 & \infty & 4 & 16 \\ 7 & 1 & 3 & \infty & 9 \\ 16 & 12 & 7 & 6 & \infty \end{bmatrix}$	12 Marks	L3	CO4	PO2

(OR)

10.	a)	What is LC – Search? Discuss LC – Search algorithm.	6 Marks	L1	CO4	PO4
	b)	Differentiate between: i) P and NP. ii) NP-complete and NP-Hard.	6 Marks	L1	CO4	PO2

CODE No.: 19BT41501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

THEORY OF COMPUTATION

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Design DFA for the set of all strings over ∑={a,b} ending with abb.	6 Marks	L4	CO1	PO3
	b)	Prove L(DFA)= L(NFA).	6 Marks	L4	CO1	PO3
		(OR)				
2.	a)	Design NFA for (0+1)*(00+11) over ∑={0,1}.	6 Marks	L3	CO1	PO2
	b)	Differentiate Moore and Mealy machines.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	State and prove pumping lemma for regular languages.	8 Marks	L4	CO1	PO3
	b)	Give the applications of regular expressions.	4 Marks	L4	CO3	PO2
		(OR)				
4.	a)	Construct ε -NFA for (a+b)*aa(a+b)*.	6 Marks	L2	CO3	PO1
	b)	Explain closure properties of regular languages.	6 Marks	L4	CO3	PO3
		UNIT-III				
5.	a)	Write CFG for identifiers starting with letter over ∑={a,b,…z| A,B,…Z}.	6 Marks	L3	CO4	PO4
	b)	Simplify the following grammar. S→ AaAb|BbBa A→ε B→ε	6 Marks	L4	CO3	PO2
		(OR)				
6.	a)	Convert to CNF the following grammar. S→aB|bA A→aS|aBB|a B→bS|bAA|b.	6 Marks	L4	CO4	PO4
	b)	Prove that L={$a^n b^n c^n$|n>0} is not CFL.	6 Marks	L2	CO4	PO1
		UNIT-IV				
7.	a)	What is LBA?	6 Marks	L2	CO2	PO1
	b)	Design PDA for L={$a^n b^{2n}$|n>=1}.	6 Marks	L4	CO5	PO4
		(OR)				
8.	a)	Design PDA for E→E+T|T T→T*F|F F→ (E)|id.	6 Marks	L2	CO4	PO3
	b)	Explain properties of recursive and recursively enumerable languages.	6 Marks	L4	CO1	PO1
		UNIT-V				
9.	a)	Explain techniques for Turing machine construction.	6 Marks	L4	CO5	PO1
	b)	What is UTM? Explain.	6 Marks	L2	CO5	PO3
		(OR)				
10		Design Turing machine for L={$a^n b^n c^n$|n>=1}.	12 Marks	L4	CO5	PO3

.

❀ ❀ ❀

CODE No.: 19BT50101 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

IRRIGATION ENGINEERING AND HYDRAULIC STRUCTURES

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define Irrigation; explain the necessity, advantages and disadvantages of Irrigation.	6 Marks	L4	CO1	PO1 PO2 PO5 PO10
	b)	Find the delta of a crop, if the base period is from 1st April to 15th August and duty is 8 square kilometer per cubic meter per second.	6 Marks	L4	CO1	PO1 PO2 PO6 PO7
		(OR)				
2.	a)	Define consumptive use and explain various methods for the determination of consumptive use.	6 Marks	L2	CO1	PO1 PO8
	b)	Explain the factors effecting duty and methods for improving duty.	6 Marks	L4	CO1	PO1 PO2

UNIT-II

3.	a)	Explain various component parts of a diversion head work with neat sketches.	6 Marks	L4	CO2	PO1 PO2 PO4 PO5 PO6 PO10
	b)	Explain the design criteria based on Bligh's theory.	6 Marks	L4	CO2	PO1 PO2 PO4 PO5 PO6 PO10
		(OR)				
4.	a)	What are the functions of launching apron and inverted filter of a weir and explain in detail?	6 Marks	L2	CO2	PO1 PO6 PO8 PO10
	b)	Explain the silt control devices with neat sketches.	6 Marks	L4	CO2	PO1 PO2 PO6 PO7 PO10

UNIT-III

5.	a)	What is a gravity dam? What are the advantages and disadvantages of gravity dams?	6 Marks	L4	CO3	PO1 PO2 PO6

						PO7 PO10
	b)	Design the practical profile of a gravity dam with the following data. R.L of the base of the dam = 1420m R.L of HFL = 1455m Specific gravity of dam material = 2.4 Safe compressive stress = 120 t/m^2 Height of waves = 1m	6 Marks	L6	CO3	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10
		(OR)				
6.	a)	Explain the criteria for safe design of an earth dam.	6 Marks	L4	CO3	PO1 PO6 PO7 PO10
	b)	Briefly explain the Morning Glory Spillway with a neat sketch.	6 Marks	L6	CO3	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8
		UNIT-IV				
7.	a)	Explain various types of linings in detail.	6 Marks	L2	CO4	PO1 PO6 PO7 PO10
	b)	Discuss the drawbacks of Kennedy's theory.	6 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO5 PO6 CO7 PO8 PO10
		(OR)				
8.	a)	A channel section has to be designed for the following data. Discharge Q = 30 cumecs, silt factor f = 1.00, side slopes = ½ : 1. Find the longitudinal slope also.	6 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO5 PO6 CO7 PO8 PO10
	b)	What is an outlet and explain the Gibb's module with a neat sketch?	6 Marks	L6	CO4	PO1 PO6 CO7 PO10
		UNIT-V				
9.	a)	Differentiate between Syphon aqueduct and canal siphon.	6 Marks	L6	CO5	PO1

						PO6 CO7 PO10
	b)	Discuss the factors in the selection of suitable type aqueduct.	6 Marks	L6	CO5	PO1 PO6 CO7 PO10
		(OR)				
10.	a)	Discuss the factors in the selection of suitable type of cross drainage work.	4 Marks	L2	CO5	PO1 PO6 CO7 PO10
	b)	Design a cross drainage work to suit the following hydraulic data. **Canal:** Discharge = 15 cumecs, Bed width = 15m, Bed level = +65.00, Full supply level = +67.00, Full supply depth = 2m,Ultimate bed level = +64.75, Ultimate FSL = +67.50, velocity of flow in canal = 0.49m/sec, average bed level of drain = +63.00, left bank width = 5m, right bank width = 2m, top bank level = 68.50 **Drain:** Catchment area = 3.4 sq km Maximum flood discharge = 34 cumecs Maximum flood level of the drain at site = +64.00 Soil is hard gravel below +62.00	8 Marks	L6	CO5	PO1 PO2 PO3 PO4 PO5 PO6 CO7 PO8 PO10

CODE No.: 19BT50102 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

FOUNDATION ENGINEERING

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain with a neat sketch wash boring method and Auger boring method of soil exploration.	6 Marks	L2	CO1	PO1 PO5 PO10
	b)	State the various methods of soil exploration and explain in detail the penetration tests.	6 Marks	L2	CO1	PO1 PO2 PO6 PO7 PO8
		(OR)				
2.	a)	Discuss Geophysical method involved in characterization of ground profile? Explain one best method with neat sketch.	6 Marks	L2	CO1	PO1 PO5 PO10
	b)	Describe the two most commonly used geophysical exploration methods and compare their merits and demerits.	6 Marks	L2	CO1	PO1 PO2 PO6 PO7 PO8 PO10

UNIT-II

3.	a)	Bring out the difference between Rankine's and Columb's theory of earth pressure.	6 Marks	L2	CO2	PO1 PO2
	b)	A 10m high retaining wall with smooth vertical back supports a horizontal backfill Φ is 330 , c= 25kPa, Density above water table 15kN/m^3 and below water table 18kN/m^3). The water table is at a depth of 3m below the surface of the backfill. The backfill supports a surcharge of 10kPA) Determine the magnitude and line of action of passive earth pressure.	6 Marks	L3	CO2	PO1 PO2 PO4 PO5 PO8 PO10
		(OR)				
4.	a)	Explain the procedure of computing active earth pressure behind retaining wall using Culmann's graphical method.	6 Marks	L2	CO2	PO1 PO5 PO10
	b)	A retaining wall has a smooth vertical back and is 8.5m in height. It retains a horizontal backfill of sand with Φ is 330. Find out the total active earth pressure per meter length of wall if γ =18kN/m^3. The water table is far below the base of the wall. The water table rises up to 4.5m level above the base. Take at=20.5kN/m^3.	6 Marks	L3	CO2	PO1 PO2 PO4 PO5 PO8 PO10

UNIT-III

5.	a)	Discuss various failure in finite slopes with a neat sketch.	6 Marks	L2	CO3	PO1 PO10
	b)	Discuss the method for checking the stability of an infinite slope in a cohesive soil. What is critical height?	6 Marks	L2	CO3	PO1 PO2 PO4

						PO6
		(OR)				
6.	a)	Explain slope stability analysis in detail.	6 Marks	L2	CO3	PO1 PO6
	b)	Calculate the safe height for an embankment rising 700 to the horizontal and to be made with a clayey soil having unit weight of 20 kN/m^3, Á= 150 and a cohesion of 20 kN/m^2. Factor of safety = 2.5. Value of stability number= 0.14.	6 Marks	L3	CO3	PO1 PO2 PO4 PO6 PO7 PO8 PO10
		UNIT-IV				
7.	a)	Explain in detail on Terzaghi's theory in prediction of ultimate bearing capacity.	6 Marks	L2	CO4	PO1 PO6
	b)	A circular footing is resting on a stiff saturated clay with unconfined compression strength of 250 kN/m^2 . The depth of foundation is 2m. Determine the diameter of the footing if the column load is 700 KN.	6 Marks	L3	CO4	PO1 PO2 PO10
		(OR)				
8.	a)	Distinguish local shear and general shear failure.	6 Marks	L2	CO4	PO1 PO2 PO6 PO10
	b)	Compute the ultimate load that an eccentrically loaded square footing of width 2m width, an eccentricity of 0.315m can take at a depth of 0.45m in soil with γ = 17.7kN/m^3, C=9kN/m^2 and ϕ= 35º, Nc=52, Nq=35 and Ny=42.	6 Marks	L3	CO4	PO1 PO2 PO3 PO4 PO6 PO8 PO10
		UNIT-V				
9.	a)	Enumerate various shapes of foundation and discuss their merits and demerits.	6 Marks	L2	CO5	PO1 PO10
	b)	A group of 16 piles of 50cm diameter is arranged with a centre to centre spacing of 1.0m. The piles are 9m long and are embedded in soft clay with cohesion 32kN/m^2. Bearing resistance may be neglected for the piles - Adhesion factor is 0.6. Determine the ultimate load capacity of the pile group.	6 Marks	L3	CO5	PO1 PO2 PO4 PO6 PO8 PO10
		(OR)				
10.	a)	Explain the measure to be taken in rectifying shifts and tilts.	6 Marks	L2	CO5	PO1 PO2 PO10
	b)	A pile not resting on rock, derives 60% of its ultimate axial capacity from skin friction and the Balance 40% from end bearing. If a safe load of 33% of the ultimate capacity is applied .to the pile,	6 Marks	L3	CO5	PO1 PO2 PO4 PO6 PO8 PO10

CODE No.: 19BT50103 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

REINFORCED CEMENT CONCRETE STRUCTURES

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Explain about under reinforced, balanced and over reinforced sections with neat sketches.	12 Marks	L5	CO1	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10
		(OR)				
2.		A T-beam is singly reinforced and has the following sectional properties. Determine the ultimate moment of resistance of the section. Width of flange = 1200mm, Thickness of flange = 150mm, Width of rib = 300mm, Effective depth = 750mm, Area of tension reinforcement = 5520mm^2. Use M20 mix and Fe-415 steel.	12 Marks	L5	CO1	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10

UNIT-II

3.	a)	Elaborate the cracking control measures.	6 Marks	L6	CO1	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10
	b)	What are the factors affecting short term and long term deflection in limit state of serviceability approach?	6 Marks	L1	CO1	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10
		(OR)				
4.		A simply supported reinforced concrete beam 300mm width and 450mm effective depth is reinforced with 5 bars of 16mm diameter as tension steel. If the beam is subjected to a shear force of 120 kN at the supports and two of the main bars are cranked up at 45^0, determine the spacing of 8mm dia 2 legged stirrups. Use M20 concrete and Fe 250 steel.	12 Marks	L5	CO2	PO1 PO2 PO3 PO4 PO5 PO6

						PO8 PO10
		UNIT-III				
5.		Design a slab for a room 4m x 5m to support a live load of 3kN/sqm. One long side of the slab is discontinuous. Use M25 concrete and Fe250 steel.	12 Marks	L6	CO3	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10
		(OR)				
6.		Design a reinforced concrete slab of dimensions 4m x 6m with two short edges discontinuous. The slab is supported by 230mm thick RCC beams cast monolithically with slab. The live load on the slab is 4kN/sqm. Floor finish on the slab is 1kN/sqm. Use M20 concrete and Fe415 steel.	12 Marks	L6	CO3	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10
		UNIT-IV				
7.	a)	Design a rectangular column to carry a service load of 1800kN. Use M25 concrete and Fe 415 steel.	6 Marks	L5	CO4	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10
	b)	Discuss the purpose of lateral ties in columns.	6 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10
		(OR)				
8.		Design a circular column with spiral reinforcement to carry a factored load of 2000kN. The effective length of the column is 3m. Use M20 and Fe 415 steel.	12 Marks	L6	CO5	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10
		UNIT-V				
9.		A Rectangular column of size 300mm x 450mm carries a service load of 800kN. The SBC of the soil is 150kN/sqm. Design a Rectangular isolated footing to support the given column load. Use M25 and Fe415 materials.	12 Marks	L6	CO5	PO1 PO2 PO3 PO4 PO5 PO6

					PO8 PO10
	(OR)				
10.	A square column 450mm x 450mm carries a service load of 1500kN. The SBC of soil is 200 kN/m². Using M30 concrete and Fe415 steel, design a square footing to support the column. Sketch the details of reinforcement.	12 Marks	L6	CO5	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10

CODE No.: 19BT50104 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

TRANSPORTATION ENGINEERING
[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Write the road length formulae of Lucknow plan.	6 Marks	L2	CO1	PO2 PO4 PO5
	b)	Derive an expression for over taking Sight Distance.	6 Marks	L4	CO2	PO1 PO2 PO3 PO8
		(OR)				
2.	a)	Draw neat sketches of various Road patterns.	6 Marks	L2	CO1	PO2 PO4 PO5
	b)	Design the length of transition curve for the following data: Design Speed = 80KMPH, Radius of Circular Curve = 150m, Super elevation = 0.07, Method of introducing super elevation Centre is raised with respect of edges, Allowable rate of introduction of super elevation = 1 in 120, Extra Widening =1.25m, Number of lane = 2, Type of terrain = Plain.	6 Marks	L3	CO2	PO1 PO2 PO4 PO5

UNIT-II

3.	a)	What are the desirable properties of bituminous mixes? Explain in detail.	6 Marks	L2	CO3	PO1 PO4 PO5
	b)	List out various tests conducted on Bitumen. Explain anyone test in detail with neat sketches.	6 Marks	L2	CO3	PO1 PO5
		(OR)				
4.		Calculate the stresses at interior, edge and corner regions of a Cement concrete pavement using Westergards's stress equation. Use the following data: Wheel load P = 5100 kg, Modulus of Elasticity of Concrete E = 3.5×10^5 kg/cm^2, Pavement thickness h = 18cm, Poisson ratio μ= 0.15, Modulus of subgrade reaction k = 6.0 kg/cm^3, Radius of contact area a = 15 cm.	12 Marks	L4	CO3	PO1 PO2 PO3 PO5 PO8

UNIT-III

5.	a)	Explain briefly about road user characteristics.	6 Marks	L2	CO4	PO1 PO2 PO4 PO5
	b)	Explain briefly about Density Speed Curve.	6 Marks	L2	CO4	PO1 PO2 PO4 PO5

(OR)

6.	a)	Explain briefly about Fundamental parameters of traffic flow.	6 Marks	L2	CO4	PO1 PO2 PO4 PO5
	b)	Explain briefly about capacity and LOS with neat sketch.	6 Marks	L2	CO4	PO1 PO2 PO4 PO5

UNIT-IV

7.	a)	If the wheel base of a vehicle moving on a B.G track is 6m, the diameter of wheel is 1.5m and depth of flange below the top of rail is 3.17 cm. Determine the extra width required to be provided on a gauge, if the radius of the curve is 160 m.	6 Marks	L3	CO5	PO1 PO2 PO4
	b)	Write the functions and requirements of sleepers and ballast in a railway track.	6 Marks	L2	CO5	PO1 PO2 PO4

(OR)

8.	a)	What are the requirements of an ideal rail joint and also explain the various rail joints used in railways with neat sketches.	6 Marks	L2	CO5	PO1 PO2 PO4
	b)	Draw a neat sketch of Left Hand Turnout.	6 Marks	L2	CO5	PO1 PO2 PO4

UNIT-V

9.	a)	Discuss Runway Orientation with neat sketches.	6 Marks	L2	CO6	PO1 PO2 PO4
	b)	Explain the special characteristics and requirements of Airport Drainage.	6 Marks	L2	CO6	PO1 PO2 PO4

(OR)

10.	a)	Write short notes on Runway Geometric design elements.	6 Marks	L2	CO6	PO1 PO2 PO4
	b)	Write the construction procedure of the wind rose diagram.	6 Marks	L3	CO6	PO1 PO2 PO4

CODE No.: 19BT50105 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

CONSTRUCTION EQUIPMENT AND AUTOMATION
[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Write in detail about the factors affecting selection of construction equipment.	6 Marks	L2	CO1	PO1
	b)	Explain about the cost of owning the construction equipment and cost of operating the construction equipment.	6 Marks	L4	CO1	PO1 PO2 PO5
		(OR)				
2.	a)	Describe various methods involved in replacement analysis.	6 Marks	L2	CO1	PO1 PO5 PO6
	b)	What do you understand by the following terms and elaborate with examples? i) Operating Cost. ii) Equipment management. iii) Equipment maintenance.	6 Marks	L4	CO1	PO1 PO2 PO5 PO10
		UNIT-II				
3.		Write about the forklifts and explain the components of forklifts in the construction industry.	12 Marks	L4	CO2	PO1 PO2
		(OR)				
4.	a)	Write brief introduction and description about bull dozers.	4 Marks	L2	CO2	PO1 PO5
	b)	Enlist the types of rollers and types of compactors and explain any few compactors and rollers in detail.	8 Marks	L4	CO2	PO1 PO2 PO5
		UNIT-III				
5.	a)	Discuss about the aggregate screens and screening plants in construction and explain merits in detail.	6 Marks	L2	CO3	PO1 PO2 PO4 PO5
	b)	Explain in detail about various pumping systems used to inject chemical grout.	6 Marks	L2	CO3	PO1 PO5
		(OR)				
6.	a)	Enlist and discuss various types of dredging.	6 Marks	L4	CO3	PO1 PO5 PO7
	b)	Explain about the applications of instruments used in tunnel construction.	6 Marks	L2	CO3	PO1 PO2 PO5

UNIT-IV

7.	a)	Discuss the applications of building automation systems.	6 Marks	L2	CO4	PO1 PO2 PO5 PO10
	b)	Explain the various sensors used for collection and processing of building data.	6 Marks	L4	CO4	PO1 PO5 PO10
		(OR)				
8.	a)	Explain the functional efficiency of BAS architecture over traditional systems.	6 Marks	L2	CO4	PO1 PO5 PO10 PO11
	b)	What does 5-D mean? Explain how 5D techniques in BIM will make the construction process easier.	6 Marks	L4	CO4	PO1 PO2 PO5 PO10 PO11

UNIT-V

9.	a)	Discuss the advantages and disadvantages of using automation and robotics in civil engineering activities.	6 Marks	L2	CO5	PO1 PO2 PO5 PO6 PO11
	b)	How is automation useful in prefab and precast engineering industries?	6 Marks	L4	CO5	PO1 PO5 PO11
		(OR)				
10.	a)	Discuss the various robotic operations depending on their operation procedure.	6 Marks	L2	CO5	PO1 PO2 PO5 PO6 PO11
	b)	What are the challenges in using robotics in civil engineering industry?	6 Marks	L4	CO5	PO1 PO5 PO11

CODE No.: 19BT50106 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

PIPELINE ENGINEERING

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Enumerate the key factors for pipeline route selection with example.	6 Marks	L2	CO1	PO1 PO5 PO7
	b)	Explain the different types of survey in pipelines.	6 Marks	L4	CO1	PO1 PO5 PO10
		(OR)				
2.	a)	What are the environmental and hydrological consideration for pipeline design?	6 Marks	L2	CO1	PO1 PO5
	b)	Explain the different types of route selection in pipeline.	6 Marks	L4	CO1	PO1 PO5 PO11
		UNIT-II				
3.		A gas transmission line needs to be constructed to transport 1,600,000 m^3/hr off natural gas from a gas refinery to the first compressor station located 100 kilometres away. The route is almost horizontal with no considerable elevation changes. Determine the size of the pipeline required to transport the gas if the pipeline inlet pressure is 1240 Weymouth, Panhandle B, and AGA fully turbulent equations to compare the diameters predicated by each flow equation Ashman effective roughness value of K_e = 750 microinches for the line. Additional data: T_{ave} = 522.68R G = 0.64 T_B = 5208R P_B =14.7 psia Z_{ave} = 1.0	12 Marks	L6	CO2	PO1 PO5 PO10 PO11
		(OR)				
4.	a)	Derive general flow equation for compressible fluids in a pipeline.	6 Marks	L4	CO2	PO1 PO2 PO4 PO5 PO6 PO7 PO8 PO10
	b)	What would be the maximum and minimum velocity of gas in a pipeline Where, Q_b=1,500,000 m^3/hr D = 56 inches P_1 = 1,240 psia P_2 = 890 psia	6 Marks	L6	CO2	PO1 PO2 PO4 PO5 PO6 PO7

		$T_f = T_b = 520$ 8R				PO8
		UNIT-III				
5.		Calculate the compressor horse power required for an adiabatic compression of 110MMSCFD gas with inlet temperature of 70 degrees Fahrenheit and 755 PSIA pressures. The discharge pressure is 1305 psia. Assume the compressibility factors at suction and discharge conditions to be Z_1=1.0, Z_2 =0.85, respectively and adiabatic = 1.4, with the adiabatic efficiency = 0.8. if the mechanical efficiency of the compressor driver is 0.95, what BHP is required? Calculate the outlet temperature of the gas.	12 Marks	L6	CO3	PO1 PO2 PO4 PO5 PO6 PO7 PO8 PO10
		(OR)				
6.	a)	The required discharge pressure in a gas compressor is P_d = 1700 psia, and K=1.4 ; the suction pressure is P_s =100 psia; and suction temperature is T_s =40 degree Fahrenheit the gases hold down to its initial temperature at each stage. For a maximum allowable discharge temperature of 350 degrees Fahrenheit, how many compressors in series will be required?	6 Marks	L6	CO3	PO1 PO2 PO4 PO5 PO6 PO7 PO8
	b)	Derive heat transfer equations for coolers.	6 Marks	L4	CO3	PO2 PO6 PO7
		UNIT-IV				
7.	a)	A pump station installation at corona consists of 2 pumps configured in series each developing 1600 feet of head at 5000 gal/min. Diesel fuel (specific gravity = 0.85, and viscosity = 5.9 CST) is pump from corona to a delivery terminal at sunny mead, 75 miles away bull stop the required discharge pressure at corona based on pipe size, pipe length, liquid properties, elevation profile between corona and sunny mead and the required delivery pressure at sunny mead has been calculated to be 1050 psi. The pump station suction pressure is maintained at 50 PS to prevent from cavitation. Assume the combined efficiency of both pumps at corona at the given flow rate to be 85%. i) Analyse the pump station pressures and determine the amount of throttle pressure and HPV wasted. ii) If electrical energy cars a sentence for kW H estimate the dollars Lost in control valve throttling.	8 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO10
	b)	Explain in detail about gas coolers with diagrams.	4 Marks	L2	CO5	PO1 PO5 PO6 PO7
		(OR)				
8.	a)	Develop the specific field of a 5 stage double suction centrifugal pump, having 14 inches. Impeller diameter, and that when operated at 3:56 zero rpm generates ahead of 2200 feet at a capacity of 3500 gal/min at the be EP on the head capacity curve. If the NPS H shrink word is 25 feet common, calculate the section specific speed.	8 Marks	L2	CO4	PO1 PO2 PO3 PO4 PO5 PO6 PO10
	b)	Explain in detail about computer applications in transient flow in liquids.	4 Marks	L4	CO5	PO1 PO5 PO6 PO7

UNIT-V

9.	An NPS Eight branch connection is to be welded to an NPS 16 career pipe. The career pipe material is API 5L x 46 wall thickness of 0.406 inch. The outlet material is API 5L grade B (seamless) schedule 40 with a wall thickness of 0.322 inch. The working pressure is 1450 psig and the working temperature is 1258 F. The pipe is being used in a Class 1 division two location. Design the branch pipe wall thickness, carrier pipe wall thickness and reinforcement area.	12 Marks	L4	CO6	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO10
	(OR)				
10.	A 16 inch crude oil pipeline (0.250 inch wall thickness) is 30 miles long from a point A to point B. The flow rate at the inlet A is 4000 bbl/hr. The crude oil properties are specific gravity of 0.85 and viscosity of 10 CST at flowing temperature of 70 degree Fahrenheit. i) Calculate the pressure required at A without any pipe loop. Assume 50 psi delivery pressure at the terminus B and a flat pipeline elevation profile. ii) If your ten mile portion CD, starting at milepost 10, is looped with an identical 16 inch Pipeline, design the reduced pressure at A. iii) What is the difference in pump HP required at A between cases (i) and (ii) above? Assume 85% pump efficiency and 30 psi pump suction pressure.	12 Marks	L2	CO6	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO10

CODE No.: 19BT50107 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

ENVIRONMENTAL POLLUTION AND CONTROL

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the effects of air pollution on human beings and plants.	6 Marks	L2	CO1	PO1 PO2 PO7
	b)	What is plume? Explain the plume behavior under various atmospheric conditions.	6 Marks	L2	CO1	PO1 PO7
		(OR)				
2.	a)	An industry utilizes 0.5 ml of oil fuel per month. It has also been estimated that for every 1 ml of oil fuel burnt in the factory, per year, the quantities of various pollutants emitted are given as. P.M= 2.9 t/yr, SO_2 = 60 t/yr, NO_x = 8 t/yr, HC = 0.4 t/yr, CO = 0.5 t//yr. Determine the height of chimney required for the safe dispersion of pollutants.	6 Marks	L5	CO1	PO1 PO2
	b)	Derive the mathematical expression to predict air quality by using box model.	6 Marks	L4	CO1	PO1 PO2 PO6 PO7

UNIT-II

3.	a)	Discus about the design and operation of centrifugal separators with a neat diagram.	6 Marks	L6	CO2	PO1 PO2 PO3
	b)	Explain the working principle and operation of wet scrubbers with a neat sketch?	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Discuss the control of air pollution from automobiles.	6 Marks	L6	CO2	PO1 PO2
	b)	Explain the latest developments in control of air and noise pollution.	6 Marks	L2	CO2	PO1 PO5 PO6

UNIT-III

5.	a)	Explain the E-coli test for bacteriological analysis of water.	6 Marks	L2	CO3	PO1 PO2 PO5 PO6
	b)	Compare and contrast the slow sand filters and rapid sand gravity filters.	6 Marks	L5	CO3	PO1 PO2

(OR)

6.	a)	Explain the nitrogen, sulphur and carbon cycles of decomposition and its importance in sewage treatment.	6 Marks	L2	CO3	PO1 PO2
	b)	The effluent from a primary settling tank is applied to a standard rate filter at the rate of 3 MLD, having a BOD of 175 mg/l. Determine the depth and volume of filter. Adopting surface loading of 2000 l/m^2/day and an organic loading of 150 g/m^3/day. Also determine the efficiency of such filter unit.	6 Marks	L5	CO3	PO1 PO2
		UNIT-IV				
7.	a)	Discuss about the methods for minimizing the soil pollution.	6 Marks	L6	CO4	PO1 PO2 PO5 PO10
	b)	Explain the effective measures to control soil pollution.	6 Marks	L2	CO4	PO1 PO2 PO5
		(OR)				
8.	a)	What are the soil pollutants? List the soil quality standards.	6 Marks	L1	CO4	PO1 PO2 PO5
	b)	Discuss the latest developments in the soil pollution control.	6 Marks	L6	CO4	PO1 PO2 PO5 PO6
		UNIT-V				
9.	a)	Discuss the composition and characteristics of solid waste.	6 Marks	L6	CO5	PO1 PO2 PO6 PO7
	b)	Explain 6R concept in solid waste management.	6 Marks	L2	CO5	PO1 PO2 PO6 PO7
		(OR)				
10.	a)	Explain the sanitary land fill and composting methods for disposal of solid waste.	6 Marks	L2	CO5	PO1 PO2 PO5 PO6
	b)	Discuss the latest developments in solid waste management.	6 Marks	L6	CO5	PO1 PO2 PO5 PO6

CODE No.: 19BT50109 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

RURAL TECHNOLOGY

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss the development of technology in India before and after Independence period.	6 Marks	L2	CO1	PO1 PO5
	b)	What are the innovative technologies that are adopted in rural development?	6 Marks	L4	CO1	PO1 PO2 PO6
		(OR)				
2.	a)	Discuss any two techniques that are adopted for poverty eradication in rural areas.	6 Marks	L2	CO1	PO1 PO6
	b)	Explain in detail the role of NABARD in development of various sectors in India.	6 Marks	L4	CO1	PO1 PO2

UNIT-II

3.	a)	List out various sources of non-conventional energy. Discuss with their advantages and disadvantages.	6 Marks	L2	CO2	PO1 PO4 PO5 PO7
	b)	Explain solar pump in agriculture, solar cooker with their working procedure.	6 Marks	L4	CO2	PO1 PO2
		(OR)				
4.	a)	Define energy and describe various types of alternative sources of energy.	6 Marks	L2	CO2	PO1 PO5 PO6
	b)	Draw the sketch of solar heater and explain its working principle.	6 Marks	L4	CO2	PO1 PO2 PO5 PO6 PO7

UNIT-III

5.	a)	Explain how food and agro based technologies gives empowerment to people who are living in rural areas.	6 Marks	L5	CO3	PO1 PO2 PO5
	b)	What are the various traditional and innovative technologies in building construction? Discuss briefly.	6 Marks	L4	CO3	PO1 PO2 PO5 PO6

(OR)

6.	a)	Discuss various building materials used in rural areas with their merits and de-merits.	6 Marks	L5	CO3	PO1 PO2 PO6
	b)	Explain the role of tissue culture and nursery in development of rural areas.	6 Marks	L4	CO3	PO1 PO2 PO5
		UNIT-IV				
7.	a)	In a village the ground water levels were dropped up to great depths. Suggest better techniques to increase the ground water levels by adopting rainwater harvesting technologies.	6 Marks	L4	CO4	PO1 PO2 PO5 PO7 PO8
	b)	Suggest the suitable water purification techniques to solve drinking water problems in rural areas.	6 Marks	L4	CO4	PO1 PO2 PO5 PO7
		(OR)				
8.	a)	Write the drinking water standards and discuss simple treatments used in rural areas.	6 Marks	L4	CO4	PO1 PO2 PO5 PO6
	b)	Explain how the economic status of people in rural areas will enhance by forming medical and aeromatic plants.	6 Marks	L2	CO4	PO1 PO5
		UNIT-V				
9.	a)	Discuss the need and necessity of technology in development of rural areas.	6 Marks	L4	CO5	PO1 PO2 PO4 PO6
	b)	Explain how the agriculture and service sectors will increase in rural areas with private sector participation.	6 Marks	L2	CO5	PO1 PO5
		(OR)				
10.	a)	Discuss with a case study how the government schemes will effect on rural development.	6 Marks	L4	CO5	PO1 PO2 PO5
	b)	Write a note on village adoptions.	6 Marks	L4	CO5	PO1 PO2 PO5

CODE No.: 19BT50201 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

CONTROL SYSTEMS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

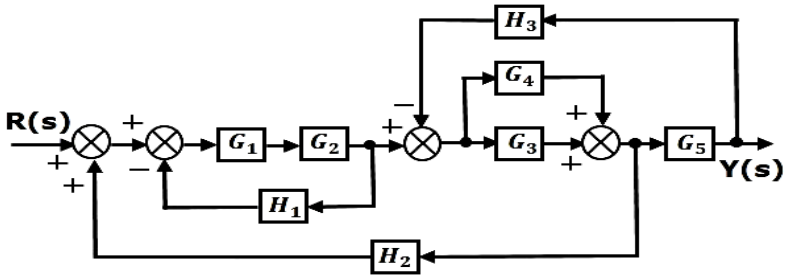
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Differentiate open-loop and closed loop systems.	6 Marks	L3	CO1	PO1
	b)	Derive the expression for the transfer function of field controlled DC motor.	6 Marks	L3	CO1	PO1

(OR)

2.		Find the transfer function for the given system using block diagram reduction.	12 Marks	L3	CO1	PO5



UNIT-II

3.	a)	Measurements conducted on a servo mechanism show the system response to be $c(t) = 1 + 0.2e^{-60t} - 1.2\ e^{-10t}$ when subjected to a unit step input: i) Obtain the expression for closed loop transfer function. ii) Determine the undamped natural frequency and the damping ratio of the system.	8 Marks	L3	CO2	PO2
	b)	What is integral control and explain how it affects the time response of a system?	4 Marks	L2	CO2	PO7

(OR)

4.	a)	The open loop transfer function of a servo system with unity feedback is G(s) = 10/s(0.1s+1). Evaluate the dynamic error coefficients when the system is subjected to an input given by the polynomial $r(t)=a_0+a_1t+(a_2/2)t^2$.	6 Marks	L4	CO3	PO4
	b)	Write a short note on static error constants and expression for steady state error for unit step, unit ramp and unit acceleration inputs.	6 Marks	L3	CO3	PO1

UNIT-III

5.	a)	Sketch the Bode plot for the system with open loop transfer function. G(s) = 2000/s(s+2)(s+100) Determine the phase cross over frequency; gain cross over frequency, phase margin and gain margin.	6 Marks	L3	CO3	PO4
	b)	Draw the root locus for the system whose open loop transfer function is given by G(s) = K/s(s+1)(s+3) and determine the value of K where the system becomes marginally stable.	6 Marks	L3	CO3	PO4

(OR)

6.	a)	Investigate the stability of a closed loop control system whose characteristic equation is given by $s^6+ s^5+ 5s^4+ 3s^3+ 2s^2+4s+8=0$	4 Marks	L3	CO3	PO4
	b)	Draw the Nyquist plot and assess the stability of the closed loop system whose open loop transfer function is given by $G(s) = \frac{(s+4)}{(s+1)(s-1)}$.	8 Marks	L3	CO3	PO4

UNIT-IV

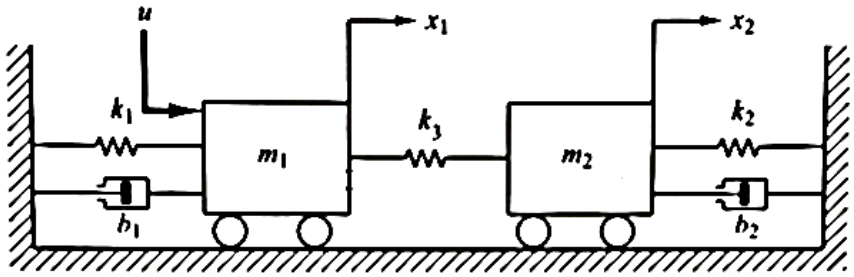
7.	Design a lead compensator using Bode Plot Method such that the velocity error constant K_v = 20 sec^{-1} and Phase Margin PM = 40° For the system $G(s) = \frac{K}{s(s+2)}$.	12 Marks	L4	CO4	PO3

(OR)

8.	Design a lag compensator using Bode Plot Method such that the velocity error constant K_v = 5 sec^{-1}, Phase Margin PM = 50° and Gain Margin GM>10 for the system $G(s) = \frac{K}{s(1+s)\left(1+\frac{1}{2}s\right)}$.	12 Marks	L4	CO4	PO3

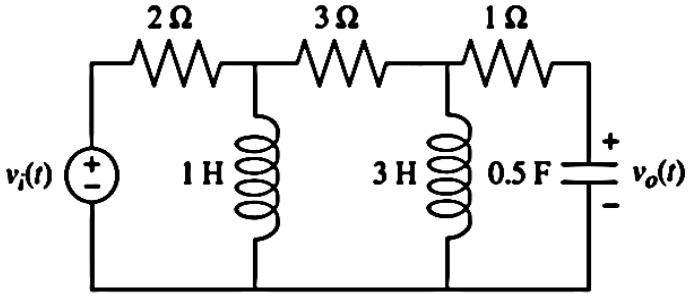
UNIT-V

9.	Obtain mathematical model and state space representation of mechanical system show in figure where *u* is the input and X_1, X_2 are the outputs. Write the state equation in matrix form.	12 Marks	L3	CO5	PO2



(OR)

10.	Find a state space model for the following electrical network shown in figure below.	12 Marks	L3	CO5	PO2



❀ ❀ ❀

CODE No.: 19BT50202 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

POWER SYSTEM OPERATION AND CONTROL

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Draw the flow chart for obtaining optimal scheduling of generating units by neglecting the transmission losses.	6 Marks	L2	CO1	PO2
	b)	Explain the following terms: i) Connected Load. ii) Load Factor. iii) Diversity Factor.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Write down similarities and dissimilarities of load curve and load duration curves.	6 Marks	L2	CO1	PO2
	b)	The fuel costs of two units are given by $F_1 = 1.5+20P_{G1} + 0.1P_{G1}^2$Rs/h and $F_2 = 1.9+30P_{G2}^2$Rs/h PG_1, PG_2 are in MW. Find the optimal schedule neglecting the losses, when the total demand is 200 MW.	6 Marks	L3	CO1	PO4
		UNIT-II				
3.		Describe the hydro thermal economic load scheduling. Derive the necessary equations.	12 Marks	L2	CO2	PO5
		(OR)				
4.	a)	In a two plant operation system, the hydro plant is operate for 8hrs during each day and the steam plant is operate all over the day. The characteristics of the steam and hydro plants are $C_S=20+30P_S+0.04P_S^2$Rs/h and $W_H =7.5\ P_H+0.0012P_H^2$ m^3/Sec. When both plants are running, power flow from steam plant to load is 190 MW and the total quantity of water is used for hydro plant operation during 8 hrs is 220 x $106m^3$. Determine generation of hydro plant and cost of water used. Neglect transmission losses.	6 Marks	L3	CO2	PO4
	b)	Illustrate the advantages of operation of power plants with hydro thermal combinations.	6 Marks	L4	CO2	PO5
		UNIT-III				
5.		Define unit commitment problem, Mention the constraints and Explain the need for unit commitment problem in operation of power system.	12 Marks	L3	CO3	PO2
		(OR)				
6.		With the help of flowchart, explain the solution of unit commitment problem using dynamic programming.	12 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	What are the basic requirements needed for control strategy in LFC system?	8 Marks	L2	CO4	PO1
	b)	Describe the fundamental characteristics of an excitation system.	4 Marks	L3	CO4	PO2
		(OR)				

8.		Clearly explain about the generator-load model with all relevant equations and represent generator load model with a block diagram.	12 Marks	L2	CO4	PO1

UNIT-V

9.		Obtain the mathematical modeling of tie line power in an interconnected system and its block diagram.	12 Marks	L3	CO5	PO4

(OR)

10.	a)	Evaluate proportional plus integral load frequency control of a single area system with a neat block diagram.	8 Marks	L3	CO5	PO1
	b)	Explain the importance of keeping voltage and frequency constant with examples.	4 Marks	L4	CO5	PO2

CODE No.: 19BT50203 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

ELECTRICAL MACHINE DESIGN

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Discuss about the factors that influence the choice of specific electric and magnetic loadings in the design of rotating machines.	12 Marks	L2	CO1	PO1
		(OR)				
2.	a)	In a DC machine the maximum flux density in the armature teeth is to be limited to 2.0Wb/m^2. The ratio of minimum width of tooth to slot pitch is 0.4. Calculate the limiting value of specific magnetic loading if the ratio pole arc to pole pitch =0.7.	4 Marks	L3	CO1	PO2
	b)	List and explain various conducting materials used in electrical machines.	8 Marks	L2	CO1	PO8

UNIT-II

3.	a)	Derive the relation between real and apparent flux densities in DC machine.	6 Marks	L2	CO2	PO5
	b)	Find the main dimensions and the number of poles of a 37kW,230V, 1400 r.p.m shunt motor so that a square pole face is obtained. The average gap density is 0.5Wb/m^2 and the ampere conductors per metre are 22000. The ratio of pole arc to pole pitch is 0.7 and the full load efficiency is 90%.	6 Marks	L3	CO2	PO2
		(OR)				
4.	a)	Explain the selection of number of poles in dc machine and mention the advantages and disadvantages of large number of poles.	6 Marks	L2	CO2	PO1
	b)	Design a suitable commutator for a 350kW, 600 r.p.m, 440V, 6 pole DC generator having an armature of 0.75m. The number of coils is 288. Assume suitable values wherever necessary.	6 Marks	L3	CO2	PO3

UNIT-III

5.		Determine the dimensions of the core, the number of turns and the cross-sectional area of conductors in the primary and secondary windings of a 100kVA, 2200/480V single-phase core type transformer to operate at a frequency of 50Hz, by assuming the following data. Approximate volt per turn =7.5V. Maximum flux density =1.2Wb/m^2. Ratio of effective cross-sectional area of core to square of diameter of circumscribing circle is 0.6. Ratio of height to width of window is 2. Window space factor = 0.28. Current density =2.5A/mm^2.	12 Marks	L4	CO3	PO3
		(OR)				
6.		The tank of 1250kVA, natural oil cooled transformer has the dimensions length, width and height as 1.55 x 0.65 x 1.85m respectively. The full load loss is13.1kW, loss dissipation due to radiations =6W/m^2-°C, loss dissipations due to convection =6.5W/m^2-°C, Improvement in convection due to provision of tubes=40%, Temperature rise =40°C, Length of each tube =1m, Diameter of tube=50mm. Find the number of tubes for this transformer. Neglect the top and bottom surfaces of the tank as	12 Marks	L4	CO3	PO7

regards the cooling.

UNIT-IV

7.		Determine the approximate diameter and length of the stator core, number of stator slots and the number of conductors for a 11kW, 400V, 3-phase, 4 pole, 1425 r.p.m delta connected induction motor. Adopt a specific magnetic loading of 0.45Wb/m^2 and a specific electric loading of 23000A/m. Assume full load efficiency and power factor as 0.85 and 0.88 respectively. The ratio of core length to pole pitch is 1. The stator employs a double layer winding.	12 Marks	L4	CO4	PO4
		(OR)				
8.		A 90kW, 500V, 50Hz, 3-phase, 8 pole induction motor has a star connected stator winding accommodated in 63 slots with 6 conductors per slot. If the slip ring voltage on open circuit is to be about 400V, find a suitable rotor winding, stating: i) number of slots ii) number of conductors per slot iii) coil span iv) slip ring voltage on open circuit v) approximate full load current per phase in rotor. Assume efficiency=0.9 and power factor =0.86.	12 Marks	L4	CO4	PO4

UNIT-V

9.	a)	Mention the factors that govern the design of field system of alternator.	4 Marks	L1	CO4	PO1
	b)	Determine the main dimensions of a 2500kVA, 187.5 r.p.m, 50Hz, 3-phase, 3kV, salient pole synchronous generator. The generator is to be a vertical, water wheel type. The specific magnetic loading is 0.6Wb/m^2 and the specific electric loading is 34000A/m. Use circular poles with ratio of core length to pole pitch =0.65. Specify the type of pole construction used if the run away speed is about 2 times the normal speed.	8 Marks	L3	CO4	PO2
		(OR)				
10.		Explain the step by step procedure for the design of field winding of synchronous machines.	12 Marks	L2	CO4	PO1

CODE No.: 19BT50204 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

ENERGY SYSTEMS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		Write the types of power plant and explain hydroelectric power plant layout in detail with neat sketch and write the names of hydroelectric power plant in India	12 Marks	L2	CO1	PO1
		(OR)				
2.		Describe the schematic arrangement of a thermal power station and explain the function of each briefly.	12 Marks	L2	CO1	PO7
		UNIT-II				
3.		Describe with a neat sketch the principle of operation of open cycle gas turbine power plant. Discuss its advantages over a steam turbine power plant. Also give applications of their type of power plant.	12 Marks	L2	CO2	PO6
		(OR)				
4.	a)	What are the Limitations of Fossil Fuels	6 Marks	L2	CO2	PO7
	b)	What are the effects of Hydro Electric Projects and why there is need for Renewable Energy Sources	6 Marks	L2	CO2	PO6
		UNIT-III				
5.		Explain about photo-voltaic energy conversion with neat sketch. List out advantages and disadvantages of the above system.	12 Marks	L2	C03	PO1
		(OR)				
6.		Explain about Horizontal and Vertical Axis wind turbines with diagrams.	12 Marks	L2	C03	PO1
		UNIT-IV				
7.		Explain the principle of OTEC operations with diagram	12 Marks	L2	CO4	PO1
		(OR)				
8.	a)	Explain about Simple Single Pool Tidal system.	6 Marks	L2	C04	PO1
	b)	Explain working of H_2– O_2fuel cell.	6 Marks	L2	C04	PO7
		UNIT-V				
9.		Briefly discuss about the operating modes of co-generating systems.	12 Marks	L2	C05	PO7
		(OR)				
10.		Explain about Stand-alone PV-wind system with a block diagram	12 Marks	L2	C05	PO1

CODE No.: 19BT50207 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

COMPUTER ORGANIZATION AND ARCHITECTURE

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Identify and analyze four main structural elements of computer.	6 Marks	L3	CO1	PO2
	b)	Paraphrase about working principle of flash memory.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Exploit the Memory hierarchy and its characteristics	6 Marks	L3	CO1	PO3
	b)	Illustrate the software and performance in computer system.	6 Marks	L1	CO1	PO5
		UNIT-II				
3.	a)	Evaluate and explain with relevant diagrams the 8085 architecture and its working.	6 Marks	L2	CO2	PO3
	b)	With timing diagram, determine the memory read operation in 8085microprocessor	6 Marks	L2	CO2	PO2
		(OR)				
4.	a)	List out the I/O and machine control instructions in microprocessor	6 Marks	L3	CO2	PO1
	b)	Discuss about the arithmetic and logic operations of 8085 microprocessor in detailed.	6 Marks	L1	CO2	PO5
		UNIT-III				
5.	a)	Summarize different types of interrupts used in 8085 microprocessor	6 Marks	L2	CO3	PO2
	b)	Show the control word format of 8255 and explain how each bit is programmed.	6 Marks	L2	CO3	PO3
		(OR)				
6.	a)	Differentiate between memory mapped I/O and I/O mapped I/O.	6 Marks	L1	CO3	PO5
	b)	Analyze and present the architecture of 8255.	6 Marks	L3	CO3	PO1
		UNIT-IV				
7.	a)	What is instruction cycle? Briefly explain with the help of state diagram.	6 Marks	L1	CO4	PO1
	b)	Interpret how registers are connected to common bus in the computer with a neat diagram.	6 Marks	L2	CO4	PO3
		(OR)				
8.	a)	Contrast various computer instruction formats with neat sketches.	6 Marks	L1	CO4	PO4
	b)	Present the concept of stored program organization.	6 Marks	L2	CO4	PO2
		UNIT-V				
9.	a)	Clarify the design of micro programmed control unit in detail.	6 Marks	L2	CO4	PO2
	b)	Explicate the selection of address for control memory.	6 Marks	L1	CO4	PO5
		(OR)				
10.	a)	With neat sketch, determine the decoding of micro operation fields.	6 Marks	L3	CO4	PO1
	b)	Specify how data hazard occurs in pipelining in detail.	6 Marks	L2	CO4	PO3

CODE No.: 19BT50301 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

COMPUTER AIDED DESIGN AND MANUFACTURING

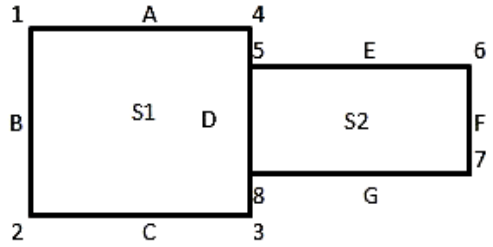
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What are the reasons for implementing a computer aided design system?	6 Marks	L2	CO1	PO1 PO2
	b)	Draw and explain the flow chart of product life cycle.	6 Marks	L2	CO1	PO1 PO2
		(OR)				
2.	a)	Describe nature and role of different elements in CIM system.	6 Marks	L2	CO1	PO1 PO2
	b)	Can you prepare all possible data base of the given object shown below?	6 Marks	L2	CO1	PO1 PO2

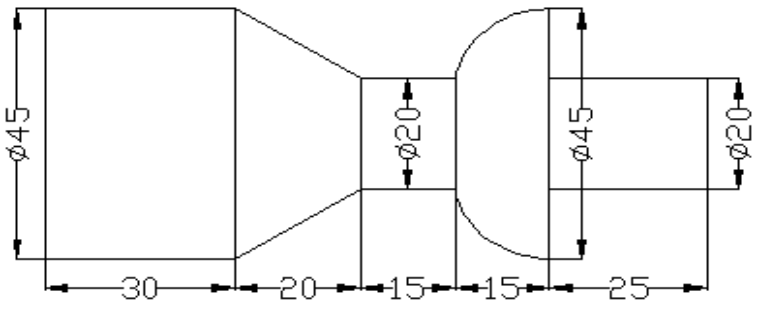


UNIT-II

3.	a)	Find the transformed coordinates when a square [(1, 1), (2, 1), (1,2) and (2, 2)] is rotated by 90° anticlockwise about a line passing through one of its vertex (1, 1) and parallel to x-axis.	6 Marks	L2	CO2	PO2 PO3
	b)	Reflect your understanding about synthetic curves commonly used in CAD with examples.	6 Marks	L2	CO2	PO2 PO3
		(OR)				
4.	a)	What is meant by geometric transformation? What is the need for it?	6 Marks	L2	CO2	PO1 PO2
	b)	Develop the parametric forms for Bezier and B spline curves	6 Marks	L3	CO2	PO1 PO2

UNIT-III

5.		Write the CNC part program to machine the component to get final profile as shown in figure.	12 Marks	L2	CO3	PO1 PO5



(OR)

6.	a)	Describe various G and M codes used in CNC machines.	6 Marks	L2	CO3	PO1 PO5
	b)	What are the basic components of NC system and explain the function of each component?	6 Marks	L2	CO3	PO1 PO2

UNIT-IV

7.	a)	Discuss the objectives of CAQC. Explain the different computer aided inspection methods.	6 Marks	L2	CO4	PO1 PO5
	b)	With a neat diagram, explain the working of generative CAPP system.	6 Marks	L2	CO4	PO1 PO5

(OR)

8.	a)	Discuss the Structure of Automated process planning system and compare it with conventional process planning.	6 Marks	L2	CO4	PO1 PO2
	b)	Describe any one contact and any one non contact Inspection methods.	6 Marks	L2	CO4	PO1 PO2 PO5

UNIT-V

9.	a)	Describe three stage transfer lines.	6 Marks	L2	CO5	PO1 PO2
	b)	Classify robot end effectors and explain any one.	6 Marks	L2	CO5	PO1 PO2

(OR)

10.	a)	Discuss elements of automation.	6 Marks	L2	CO5	PO1 PO2
	b)	Explain robot joints and grippers.	6 Marks	L2	CO5	PO1 PO2 PO5

CODE No.: 19BT50302 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

OPERATIONS RESEARCH

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define and explain the significance of Slack variable, Surplus variable, and Artificial variable in linear programming resource allocation model.	4 Marks	L2	CO1	PO1 PO2
	b)	A patient visits the doctor to get treatment for ill health. The doctor examines the patient and advises him to consume **at least** 40 units of vitamin *A* and 50 units of vitamin *B* daily for a specified time period. He also advises the patient that to get vitamin *A* and vitamin *B* he has to drink tonic *X* and tonic *Y* that have both vitamin *A* and vitamin *B* in a proportion. One unit of tonic *X* consists 2 units of vitamin *A* and 3 units of vitamin *B* and one unit of tonic *Y* consists of 4 units of vitamin *A* and 2 units of vitamin *B*. These tonics are available in medical shops at a cost of Rs.3.00 and Rs.2.50 per unit of *X* and *Y* respectively. Now the problem of patient is how much of *X* and how much of *Y* is to be purchased from the shop to **minimize** the total cost and at the same time he can get required amounts of vitamins *A* and *B*. Formulate an LPP for this and hence find the optimal product mix.	8 Marks	L3	CO1	PO1 PO2

(OR)

2.	a)	Answer the following in brief. i) Outline the scope of OR techniques. ii) Purpose of Artificial variable. iii) Purpose of slack/surplus variable.	5 Marks	L2	CO1	PO1 PO2
	b)	Solve the following LPP with Two- Phase Simplex method. Maximize $Z=3x_1-x_2$. S/t $2x_1+x_2\geq 2$; $x_1+3x_2\leq 2$; $x_2\leq 4$ and $x_1, x_2 \geq 0$	7 Marks	L3	CO1	PO1 PO2

UNIT-II

3.	a)	List the applications of AP.	2 Marks	L1	CO2	PO1 PO2
	b)	A manager has 4 jobs on hand to be assigned to 3 of his clerical staff. Clerical staff differs in efficiency. The efficiency is a measure of time taken by them to do various jobs. The manager wants to assign the duty to his staff, so that the total time taken by the staff should be minimum. The matrix given below shows the time taken by each person to do a particular job. Help the manager in assigning the jobs to the personnel.	10 Marks	L3	CO2	PO1 PO2

Jobs	Men (time taken to do job in hrs.)		
	X	Y	Z
A	10	27	16
B	14	28	7
C	36	21	16

D	19	31	21

(OR)

4.	a)	What is degeneracy in transportation problems? How can you resolve it?	2 Marks	L2	CO1	PO1 PO2
	b)	Solve the following Transportation Problem to find the minimum cost.	10 Marks	L3	CO1	PO1 PO2

Factories→ ↓Markets	I	II	III	IV	Supply
A	2	3	11	7	6
B	1	0	6	1	1
C	5	8	15	9	10
Demand	7	5	3	2	--

UNIT-III

5.	a)	Give the limitations of game theory in brief.	2 Marks	L2	CO2	PO1 PO2
	b)	Solve the following game.	10 Marks	L3	CO2	PO1 PO2

Player B

		I	II	III	IV
	I	-5	3	1	20
Player A	II	5	5	4	6
	III	-4	2	0	5

(OR)

6.	a)	Explain in detail about the costs associated with inventory.	4 Marks	L2	CO3	PO1 PO2
	b)	The demand for an item is 8000 units per annum and the unit cost is Re.1/-. Inventory carrying charges of 20% of average inventory cost and ordering cost is Rs. 12.50 per order. Calculate optimal order quantity, optimal order time, optimal inventory cost and number of orders.	8 Marks	L3	CO3	PO1 PO2

UNIT-IV

7.	a)	Define the three time estimates in PERT.	2 Marks	L2	CO4	PO1 PO2
	b)	For the network given below, calculate the various starts and finish times of the activities and also different floats.	10 Marks	L3	CO5	PO1 PO2 PO3

Activity	A	B	C	D	E	F	G	H
Immediate Predecessor	-	A	A	C	C	B,C	B,C	D,F
Duration	3	2	3	3	2	7	5	6

(OR)

8.	a)	What are the rules of network construction?	2 Marks	L2	CO5	PO1 PO2
	b)	A project is comprised of 8 independent activities as given below:	10 Marks	L3	CO5	PO1 PO2 PO3

Activity	A	B	C	D	E	F	G	H
Predecessor activity	-	-	-	A	C	B, D, E	A	C
Optimistic time	1	2	3	2	4	5	2	1
Normal time	3	3	4	9	5	6	4	3
Pessimistic time	5	4	5	10	6	13	6	6

i) What is the expected time to complete the project?

ii) What is the probability of completing the project in 20 weeks (or) less?

UNIT-V

9.	a)	Explain the structure of a Queuing system in detail.	4 Marks	L2	CO4	PO1 PO2
	b)	The arrival rate of customers at a banking counter follows Poisson distribution with a mean of 45 per hour. The service rate of the counter clerk also follows Poisson distribution with a mean of 60 per hour. i) What is the probability of having 0, 5 and 10 customers in the system? ii) Find the average number of customers waiting in the queue and in the system. iii) Find average waiting time of the customer in the queue and in the system.	8 Marks	L3	CO4	PO1 PO2 PO3

(OR)

10.	a)	What is Monte-Carlo simulation? Explain the steps involved.	4M	L2	CO5	PO1 PO2
	b)	A tourist car operator finds that during the past few months the car's use has varied so much that the cost of maintaining the car varied considerably. During the past 200 days the demand for the car fluctuated as below:	8M	L3	CO5	PO1 PO2 PO3

Trips per week	Frequency	Probability
0	16	0.08
1	24	0.12
2	30	0.15
3	60	0.30
4	40	0.20
5	30	0.15

Using the following random numbers, simulate the demand for a ten week period.
82, 95, 18, 96, 20, 84, 56, 11, 52, 03.

CODE No.: 19BT50303 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

THERMAL ENGINEERING-II

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	With the help of neat sketch, explain the working principle of Benson boiler.	6 Marks	L2	CO1	PO1 PO2 PO3 PO4 PO6
	b)	Discuss the construction and working principle of Cochran boiler indicating the flow path of flue gases and water circulation.	6 Marks	L2	CO1	PO1 PO2 PO3 PO4 PO6
		(OR)				
2.	a)	Explain induced draught and forced draught.	6 Marks	L3	CO1	PO1 PO2 PO3 PO4 PO6
	b)	Determine the height of the chimney to produce a static draught of 22 mm of water if the mean flue gas temperature in chimney is 290ºC and atmospheric temperature is 28ºC. The gas constant for air is 0.287 kJ/kg/K. Assume barometer reading as 760mm of Hg.	6 Marks	L3	CO1	PO1 PO2 PO3 PO4 PO6

UNIT-II

3.	a)	In a steam nozzle, the steam expands from 10 bar and 250ºC to 2 bar. Assuming isentropic expansion and negligible velocity determine: i) Throat area. ii) Exit velocity. iii) Exit area of the nozzle.	6 Marks	L3	CO2	PO1 PO2 PO3 PO4 PO6
	b)	What is the effect of friction flow through a steam nozzle? Explain with the help of h-s diagram.	6 Marks	L3	CO2	PO1 PO2 PO3 PO4 PO6
		(OR)				
4.	a)	Explain the effect of air leakage in a condenser.	6 Marks	L3	CO2	PO1 PO2 PO3 PO4 PO6
	b)	The inlet and out let temperatures of cooling water to a condenser are 37.5ºC and 30ºC respectively. If the vacuum in the barometer is 706 mm of mercury with barometer reading 760mm. Determine condenser efficiency.	6 Marks	L3	CO2	PO1 PO2 PO3 PO4

						PO6
		UNIT-III				
5.	a)	Distinguish between impulse and reaction turbine.	6 Marks	L2	CO3	PO1 PO2 PO3 PO4 PO6
	b)	The velocity of steam exiting the nozzle of the impulse stage of a turbine is 400 m/s. The blade operates close to the maximum balding efficiency. The nozzle angle is 20º. Considering equiangular blades and neglecting blade friction, calculate for a steam flow of 0.6 kg/s, the diagram power and diagram efficiency.	6 Marks	L3	CO3	PO1 PO2 PO3 PO4 PO6
		(OR)				
6.	a)	Define the term degree of reaction and show that for parson's reaction turbine the degree of reaction is 50%.	6 Marks	L2	CO3	PO1 PO2 PO3 PO4 PO6
	b)	A certain stage of Parson's turbine consists of one row of fixed blades and one row of moving blades. The details of the turbine are: The mean diameter of the blades = 68cm, RPM of the turbine = 3600, the mass of the steam passing per sec = 13.5 Kg, Steam velocity at the exit from fixed blades = 143.7m/s, the blade outlet angle = 20º. Calculate the power developed in the stage and gross efficiency. Assuming carry over coefficient as 0.74 and the efficiency of conversion of heat energy into kinetic energy in the blade channel as 0.92.	6 Marks	L3	CO3	PO1 PO2 PO3 PO4 PO6
		UNIT-IV				
7.	a)	Derive an expression for the COP of Bell-Coleman cycle.	6 Marks	L2	CO4	PO1 PO2 PO3 PO4 PO6 PO7
	b)	An air refrigeration plant working on Bell Coleman cycle operates between 1 bar and 5 bar. The adiabatic efficiency of compression is 85% and expansion is 90%. Find out the COP of the system and its tonnage when the air flow rate is 1kg/sec. The cooler temperature is 270C and refrigerant temperature is 0ºC. Also, draw the cycle on P-V and T-S planes.	6 Marks	L3	CO4	PO1 PO2 PO3 PO4 PO6 PO7
		(OR)				
8.	a)	Explain the working of simple vapour absorption refrigeration system with a neat sketch.	6 Marks	L2	CO4	PO1 PO2 PO3 PO4 PO6 PO7
	b)	In a standard vapour compression refrigeration cycle, operating between an evaporator temperature of -10ºC and a condenser temperature of 40ºC, the enthalpy of refrigerant, Freon -12 at the end of the compression is 220kJ/kg. Show the cycle diagram on T-s plane. Calculate i) COP of the cycle. ii) refrigerating	6 Marks	L3	CO4	PO1 PO2 PO3 PO4 PO6

capacity. iii) compressor power. Assume mass flow rate 1kg/min. Property table of F-12 is given below. PO7

T (ºC)	P(bar)	h_f (kJ/kg)	h_g (kJ/kg)
-10	0.2191	26.85	183.1
40	0.9607	74.53	203.1

UNIT-V

9.	a)	Outline the layout of summer Air-conditioning system and explain briefly.	6 Marks	L3	CO5	PO1 PO2 PO3 PO4 PO6 PO7
	b)	5 grams of water vapour per kg of atmospheric air is removed and temperature of air after removing the water vapour becomes 25ºC DBT. Find the following: i) R.H ii) D.P.T Assume condition of atmospheric air is 35ºC and 60% R.H and a pressure of 1.013 kg/cm.	6 Marks	L3	CO5	PO1 PO2 PO3 PO4 PO6 PO7
		(OR)				
10.	a)	Explain the process of Heating and dehumidification.	6 Marks	L2	CO5	PO1 PO2 PO3 PO4 PO6 PO7
	b)	Air is cooled from 39^0C DBT and 29% RH to 24^0C at the rate of $5m^3/s$. Calculate the capacity of the cooling coil if the surface of the coil is 20^0C. Also, calculate bypass factor.	6 Marks	L3	CO1	PO1 PO2 PO3 PO4 PO6 PO7

CODE No.: 19BT50304 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

AUTOMOBILE ENGINEERING
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		Explain briefly various parts of an automobile with the help of a neat sketch.	12 Marks	L2	CO1	PO2
		(OR)				
2.	a)	List different types of nozzles and describe the working of pintle nozzle.	8 Marks	L2	CO1	PO2
	b)	Justify the need for a governor in a CI engine and list various types of governors.	4 Marks	L1	CO1	PO2
		UNIT-II				
3.	a)	Describe the function of a thermostat.	4 Marks	L2	CO2	PO2
	b)	With the help of a neat sketch elucidate tubular radiator and mentions the materials used for radiators.	8 Marks	L2	CO2	PO1
		(OR)				
4.		Elucidate the working of electronic ignition system and explain the benefits of electronic ignition system over ignition system with distributor.	12 Marks	L2	CO2	PO2
		UNIT-III				
5.		Draw simple wiring diagram of electric system of an automobile and mention the necessity of each component.	12 Marks	L2	CO3	PO1
		(OR)				
6.		Explain the following terms: i)VVT. ii)ASS. iii) EBD.	12 Marks	L2	CO3	PO2
		UNIT-IV				
7.	a)	Describe the working of a synchromesh type of gear box.	8 Marks	L2	CO4	PO2
	b)	Differentiate between a live and a dead axle.	4 Marks	L1	CO4	PO2
		(OR)				
8.		Explain steering geometry.	12 Marks	L2	CO4	PO1
		UNIT-V				
9.		Describe the MacPherson strut assembly of independent suspension system. Compare it with the double wish bone suspension system.	12 Marks	L2	CO5	PO2
		(OR)				
10.	a)	What is brake adjustment? When is it required?	4 Marks	L1	CO5	PO1
	b)	Elucidate the working of hydraulic braking system with necessary diagram.	8 Marks	L2	CO5	PO2

❀ ❀ ❀

CODE No.: 19BT50310 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

ARTIFICIAL INTELLIGENCE AND ROBOTICS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		List out AI Techniques and explain in detail about LISP programming.	12 Marks	L2	CO1	PO1
		(OR)				
2.		Explain the concept of rationality and structure of Intelligent agents.	12 Marks	L2	CO1	PO1
		UNIT-II				
3.		What are the various types of robot configuration? Explain with neat sketch.	12 Marks	L2	CO2	PO1 PO2
		(OR)				
4.	a)	What do you understand by degree of freedom (DOF)? How many DOFs are required to position an end effect or at any point in 3-D space?	6 Marks	L2	CO2	PO1 PO2
	b)	Discuss in detail about Joint notation scheme in robotics.	6 Marks	L2	CO2	PO1 PO2
		UNIT-III				
5.	a)	What is homogenous transformation of coordinates? Write homogenous transformation matrices for rotation in 3D.	6 Marks	L2	CO3	PO1 PO2
	b)	Distinguish forward and inverse kinematics.	6 Marks	L3	CO3	PO1 PO2
		(OR)				
6.		Derive the expression for planar R-R Manipulator using Lagrange Euler Formulations.	12 Marks	L3	CO3	PO1 PO2 PO3
		UNIT-IV				
7.	a)	Determine the time required for each joint of a three-axis RRR manipulator to travel the following distances using skew motion; Joint 1, 1000; joint 2, 300; and joint 3, 600. All joints travel at a rotation velocity of 150/s.	8 Marks	L3	CO4	PO1 PO2 PO3
	b)	Define straight line motion and joint integrated motion in robot manipulator.	4 Marks	L1	CO4	PO1
		(OR)				
8.	a)	Discuss the functions of sensors used in robotics.	6 Marks	L2	CO4	PO1
	b)	Explain the working of any two position sensors with neat sketches.	6 Marks	L2	CO4	PO1 PO2
		UNIT-V				
9.		Write a VAL program for inserting a bolt in a hole by approaching 50mm above the bolt, by moving to an intermediate point A, along a straight line and approaching the hole 70mm from above and finally setting the gripper 50mm above the hole.	12 Marks	L3	CO5	PO1 PO2 PO3
		(OR)				
10.	a)	Discuss in detail about modern robots and its future applications.	6 Marks	L2	CO5	PO1
	b)	Explain the concept of robot intelligence and task planning.	6 Marks	L2	CO5	PO1

CODE No.: 19BT50313 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

NON-CONVENTIONAL ENERGY SOURCES

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Enumerate the prospects of Non-conventional energy sources availability in India.	6 Marks	L1	CO1	PO1
	b)	What are the advantages and limitations of renewable energy sources?	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Illustrate the working principles of Pyrheliometer and Sunshine recorder.	6 Marks	L2	CO1	PO1
	b)	Enumerate the advantages, disadvantages and limitations of solar energy.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	State the advantages of disadvantages of concentrated collectors over flat plate collectors.	6 Marks	L2	CO2	PO1
	b)	Derive an expression for efficiency of a flat plate collector.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Classify concentrating collectors and explain the working of parabolic concentrating collector with a neat sketch.	6 Marks	L2	CO2	PO1
	b)	Write a short note on Air collectors and applications of solar air heaters.	6 Marks	L2	CO2	PO1 PO2
		UNIT-III				
5.	a)	Explain photovoltaic conversion and state the reasons for low efficiency of solar cells.	6 Marks	L2	CO3	PO1
	b)	Explain the working of Solar cooling with the help of schematic diagram.	6 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Explain in brief about thermal storage system of solar energy.	6 Marks	L2	CO3	PO1 PO2
	b)	Write a short note on Solar distillation.	6 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	Discuss in detail the advantages and disadvantages of horizontal axis and vertical axis wind mills.	6 Marks	L2	CO4	PO1
	b)	Explain briefly the factors that determine the power output from wind energy.	6 Marks	L2	CO4	PO1
		(OR)				
8.	a)	Discuss the principle of wind energy conversion and basic components of wind energy conversion systems.	6 Marks	L2	CO4	PO1
	b)	With the help of a neat sketch, explain the anaerobic digestion process for the production of bio-gas.	6 Marks	L2	CO4	PO1

UNIT-V

9.	a)	What are the environmental problems caused by geothermal energy?	6 Marks	L2	CO5	PO1 PO2
	b)	Explain Hot dry rocks resources of geothermal energy and how they can be exploited as a source of energy.	6 Marks	L2	CO5	PO1
		(OR)				
10.	a)	Explain in detail with a neat sketch the closed OTEC cycle.	6 Marks	L2	CO5	PO1
	b)	Explain in detail about the double basic tidal energy system.	6 Marks	L2	CO5	PO1 PO2

CODE No.: 19BT50401 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

DIGITAL COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain in detail the Delta modulation transmitter and Receiver.	6 Marks	L2	CO1	PO1
	b)	What is a Compander? Why Compander is invariably used in PCM system? Explain different ways of implementing Compander in a PCM system.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Explain the effects of thermal noise in binary PCM.	6 Marks	L2	CO1	PO1
	b)	A μ- law compressor has a quantizer range of -5 V to 5 V. Find the output range of this quantizer for inputs of -25 mV, 300 mV, and 4.5 V.	6 Marks	L2	CO1	PO4

UNIT-II

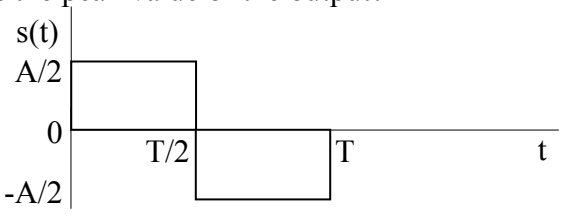
3.	a)	Explain how Nyquist's Criterion eliminates interference in the absence of noise for distortion-less baseband binary transmission.	6 Marks	L2	CO2	PO1
	b)	The binary data stream 001101101 is applied to the input of duo-binary system. Determine the duo-binary coder output and the receiver output with and without precoder.	6 Marks	L1	CO2	PO3
		(OR)				
4.	a)	Explain the duo binary signaling scheme with and without a precoder.	6 Marks	L1	CO2	PO1
	b)	A binary PAM wave with bit duration of 10 μsec is to be transmitted over a channel with a maximum bandwidth of 75kHz. Determine a suitable raised cosine spectrum for this purpose.	6 Marks	L1	CO2	PO4

UNIT-III

5.	a)	Derive the expression for error probability of Coherent FSK system.	6 Marks	L3	CO2	PO2
	b)	The bit stream 11001100101…. is to be transmitted using DPSK. Determine the encoded sequence and transmitted phase sequence and also find the demodulated signal.	6 Marks	L2	CO2	PO3
		(OR)				
6.	a)	Explain the receiver and signal space diagram of BPSK	6 Marks	L2	CO2	PO1
	b)	Consider the signal shown below.	6 Marks	L3	CO2	PO4

i) Determine the impulse response of a filter matched to this signal and sketch it as a function of time.
ii) Plot the matched filter output as a function of time.
iii) What is the peak value of the output?

-



UNIT-IV

7.	a)	State and explain the channel coding theorem.	6 Marks	L2	CO3	PO1
	b)	Consider the discrete memory less source, the source alphabet $S=\{s_1, s_2, s_3\}$ with probabilities $P=\{0.4, 0.35, 0.25\}$ respectively. Find the entropy of the 1^{st} order source and the 2^{nd} order extension of the source.	6 Marks	L3	CO3	PO3
		(OR)				
8.	a)	State and prove the properties of Entropy?	6 Marks	L1	CO3	PO1
	b)	Define: i) Discrete entropy H (X), joint entropy H (X,Y) and Mutual information I(X;Y). ii) Show that I (X;Y) = H (X)+ H (Y) - H (X,Y).	6 Marks	L2	CO3	PO3

UNIT-V

9.	a)	Draw the block diagram of syndrome calculator for an (n, k) cyclic code and explain its working.	6 Marks	L2	CO4	PO2
	b)	A rate 1/3 convolutional encoder has generator vectors {1 0 0}, {1 1 1} and {1 0 1}. Draw the encoder circuit, code tree and state diagram.	6 Marks	L3	CO4	PO4
		(OR)				
10.	a)	Describe how the errors are corrected using Hamming code with an example.	6 Marks	L2	CO4	PO2
	b)	Determine the generator polynomial g(x) for a (7, 4) cyclic code, and find code vectors for the following data vectors 1100, 1010, and 1000.	6 Marks	L3	CO4	PO3

CODE No.: 19BT50402 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

DIGITAL SIGNAL PROCESSING

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

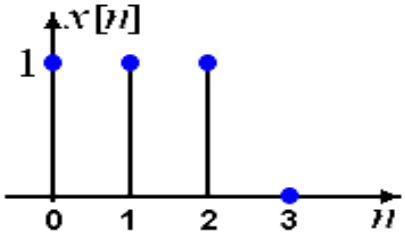
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Check the Causal or Non-Causal, and time invariance of the following systems. $i)\ y[n] = \cos\{x[n]\}$ $ii)\ y[n] = 2x[n] + 1$	6 Marks	L2	CO1	PO1
	b)	Test the linearity and Stability of the following systems. Also comment on the results. $i)\ y[n] = x^2[n]$ $ii)\ y[n] = x[n^2]$s	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Consider the Z-Transform $X[z] = \dfrac{1 - \frac{1}{3}z^{-1}}{\left(1 + \frac{1}{2}z^{-1}\right)\left(1 - \frac{2}{3}z^{-1}\right)}$, for causal sequence. Determine the sequence $x[n]$	8 Marks	L2	CO1	PO3
	b)	Find the impulse response for the following discrete-time system. $y[n] + 0.2y[n-1] = x[n] - x[n-1]$.	4 Marks	L2	CO1	PO2

UNIT-II

3.	a)	State and Prove the following Properties. i) Convolution. ii) Frequency Shifting using DFT.	6 Marks	L2	CO2	PO1
	b)	Determine the 4-point DFT of an aperiodic sequence shown in figure.	6 Marks	L3	CO2	PO2



(OR)

4.		Compute 8-point DFT of the following sequence using Radix-2 DIT-FFT and DIF-FFT algorithm. X[n]={1,1,1,1,1,1,1,1}.	12 Marks	L3	CO2	PO2

UNIT-III

5.	a)	Illustrate the steps involved in designing IIR digital low pass filters using Bi-linear transformation.	6 Marks	L2	CO3	PO1
	b)	List out the advantages and disadvantages of FIR filter and IIR filters.	6 Marks	L3	CO3	PO2
		(OR)				

6.		Design a Butterworth digital high pass filter with the following specifications $\left\|H(e^{j\omega})\right\| \le 0.2 \qquad 0 \le \omega \le 0.2\pi$ $0.8 \le \left\|H(e^{j\omega})\right\| \le 1 \qquad 0.6\pi \le \omega \le \pi$ Using Bilinear transformation.	12 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	Compare the performance of Triangular window and Hamming window.	6 Marks	L2	CO3	PO1
	b)	Consider the following transfer function $H[z] = 1 + \frac{3}{4}z^{-1} + \frac{17}{8}z^{-2} + \frac{3}{4}z^{-3} + z^{-4}$. Realize the system in i) Cascaded form. ii) Minimum number of multipliers in cascaded form.	6 Marks	L3	CO3	PO2
		(OR)				
8.	a)	Design a linear phase LPF with a cutoff frequency of 1 KHz and sampling rate of 4 KHz. Take 9 samples. Use Hamming window.	6 Marks	L4	CO3	PO2
	b)	Obtain the FIR linear phase and cascade form realization for the system characterized by the transfer function given as, $H[z] = \left(1 + \frac{1}{2}z^{-1} + z^{-2}\right)\left(1 + \frac{1}{4}z^{-1} + z^{-2}\right)$.	6 Marks	L3	CO3	PO2
		UNIT-V				
9.		Discuss different addressing modes used in programmable Digital Signal Processor	12 Marks	L2	CO4	PO1
		(OR)				
10.		Explain the architecture of YMS320C6X with neat sketch and explain the operation.	12 Marks	L2	CO4	PO1

CODE No.: 19BT50403 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

VLSI DESIGN

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

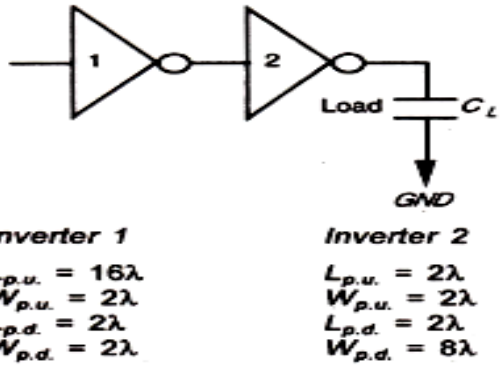
1.	a)	Explain briefly the operation of TTL NAND gate in tristate output configurations.	6 Marks	L2	CO1	PO2
	b)	Explain the ECL circuit.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Compare the performance of I^2C, CMOS and ECL logic.	6 Marks	L1	CO1	PO2
	b)	i) Define Fan-out. ii) What is propagation delay? iii) Define noise margin. iv) Define fan in. v) What is Operating temperature? vi) What are the types of TTL logic?	6 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Derive the relation between IDS and VDS of MOSFET.	8 Marks	L2	CO2	PO2
	b)	What are the effects of scaling of Vt?	4 Marks	L3	CO2	PO3
		(OR)				
4.	a)	Explain the process of fabrication for CMOS technology with neat diagrams.	8 Marks	L3	CO2	PO3
	b)	Using necessary sketches, explain about photolithography process, in semiconductor device manufacture.	4 Marks	L2	CO2	PO1

UNIT-III

5.	a)	Two nMOS inverters are cascaded to drive a capacitive load $C_L = 16C_g$ as shown in Figure. Calculate the pair delay (V_{in} to V_{out}) in terms of geometry indicated in the figure.	6 Marks	L4	CO3	PO4



	b)	Explain the problem of driving large capacitive loads. How such loads can be driven?	6 Marks	L2	CO3	PO2
		(OR)				
6.	a)	Explain the terms figure of merit of MOSFET and output conductance using necessary equations.	4 Marks	L2	CO3	PO2
	b)	Draw the stick diagram and mask layout for CMOS two input NOR gate and stick diagram of two input NAND gates.	8 Marks	L3	CO3	PO6

UNIT-IV

7.	a)	Draw the architecture of Carry Select Adder and explain its operation for 16-bit.	6 Marks	L3	CO3	PO4
	b)	Implement 4**:**1 multiplexer circuit using transmission logic.	6 Marks	L2	CO3	PO5
		(OR)				
8.	a)	Design a parity generator for n-bit and explain the functioning of it with a transistor schematic and layout.	7 Marks	L2	CO3	PO5
	b)	Explain 4-bit array multiplier with neat diagram.	5 Marks	L2	CO3	PO5

UNIT-V

9.	a)	What type of switch technologies are used for CPLDs and FPGAs? Compare them.	6 Marks	L1	CO4	PO2
	b)	Draw the macro cell used in CPLD and explain its working.	6 Marks	L4	CO4	PO4
		(OR)				
10.	a)	Write about SRAM Programming technology of programmable FPGAs with neat sketches.	6 Marks	L4	CO4	PO4
	b)	What is an FPGA? explain about “why Field programmable gate arrays”	6 Marks	L1	CO4	PO1

CODE No.: 19BT50405 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

FIBER OPTIC COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Outline various elements of an optical communication system. Explain each element in brief.	6 Marks	L3	CO1	PO1
	b)	Paraphrase about Cut-off wavelength and mode field diameter of single mode fibers.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Distinguish the step index fibers and graded index fibers.	6 Marks	L3	CO1	PO1
	b)	Identify different fiber materials used in optical communication. Explain.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Illustrate the absorption mechanism in optical communication.	6 Marks	L3	CO2	PO3
	b)	With relevant diagrams and appropriate expressions, explain about the intermodal dispersion.	6 Marks	L2	CO2	PO2
		(OR)				
4.	a)	Summarize core and cladding losses in an optical fiber.	6 Marks	L3	CO2	PO1
	b)	Interpret the information capacity determination and group delay with necessary equations.	6 Marks	L3	CO2	PO3
		UNIT-III				
5.	a)	Generate the laser diode rate equation.	6 Marks	L2	CO3	PO1
	b)	Develop the expression for how temperature effects on Avalanche gain in a p-i-n diode.	6 Marks	L3	CO3	PO2
		(OR)				
6.	a)	Suggests improvements in reach through avalanche photodiode structure and the electric fields.	6 Marks	L2	CO3	PO2
	b)	Discuss about the Resonant frequencies of laser.	6 Marks	L3	CO3	PO4
		UNIT-IV				
7.	a)	Mention and explain different Splicing techniques.	6 Marks	L1	CO4	PO1
	b)	Describe about connector return loss.	6 Marks	L2	CO4	PO2
		(OR)				
8.	a)	Bring out the necessary equations to associate with the optical power launching from a light source to a fiber.	6 Marks	L2	CO4	PO5
	b)	Define about the equilibrium Numerical aperture with its principles.	6 Marks	L1	CO4	PO1
		UNIT-V				
9.	a)	Justify NRZ and RZ line codes in optical link with an example.	6 Marks	L3	CO5	PO1
	b)	Explain about point-point links in Optical system design.	6 Marks	L2	CO5	PO2
		(OR)				
10.	a)	Infer the contribution of how the attenuation does and dispersion is measured in optical communication.	6 Marks	L3	CO5	PO5
	b)	Compare the overall fiber dispersion in multimode and single mode fibers.	6 Marks	L2	CO6	PO1

CODE No.: 19BT50406 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

FPGA ARCHITECTURES AND APPLICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Distinguish between programmable logic devices.	6 Marks	L1	CO1	PO2
	b)	Explain about PAL and implement $f_1 = \Sigma (1, 2, 3, 4, 6, 8)$, $f_2 = \Sigma (0, 2, 3, 4, 5)$.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Implement a BCD to Excess-3 code convertor by ROM.	6 Marks	L3	CO1	PO3
	b)	Write short notes on Sequential Programmable Logic Deceives.	6 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Discuss in detail the architecture of programmable interconnects in FPGAs.	6 Marks	L1	CO2	PO1
	b)	With neat diagrams, explain programmable logic block architectures of FPGAs.	6 Marks	L2	CO2	PO2
		(OR)				
4.	a)	Draw the internal architecture of FPGA and explain its operation in detail.	6 Marks	L2	CO2	PO2
	b)	Explain advantages and limitations of FPGAs.	6 Marks	L1	CO2	PO1
		UNIT-III				
5.	a)	Draw and explain the Xilinx XC4000 Architecture and describe its CLB, I/O block functional operations.	6 Marks	L2	CO3	PO2
	b)	Analyse an FPGA with a simple SRAM programmable architecture.	6 Marks	L3	CO3	PO1
		(OR)				
6.	a)	List out salient features of Xilinx 2000 CLB.	6 Marks	L1	CO3	PO1
	b)	Draw and explain the Xilinx XC3000 Architecture and describe its CLB, I/O block functional operations.	6 Marks	L2	CO3	PO2
		UNIT-IV				
7.	a)	With a neat block diagram, explain ACT2 architecture and its logic modules.	6 Marks	L1	CO3	PO1
	b)	Discuss the architectural differences and specifications of Act_1, Act_2 and Act_3 of family FPGAs.	6 Marks	L2	CO3	PO2
		(OR)				
8.	a)	With a neat block diagram, explain ACT3 architecture and its logic modules.	6 Marks	L1	CO3	PO1
	b)	Explain the ACT_2 architecture for high fan-in example.	6 Marks	L2	CO3	PO2
		UNIT-V				
9.	a)	Explain about position tracker of a Robot manipulator with help of FPGA along with circuit diagram.	6 Marks	L2	CO4	PO2
	b)	Design a five bit binary counter with ACT devices.	6 Marks	L3	CO4	PO3
		(OR)				
10.	a)	Draw the circuit diagram of fast video controller and explain its operation in detail.	6 Marks	L2	CO4	PO2
	b)	Design Mod-6 counter using ACT FPGA and explain its operation.	6 Marks	L3	CO4	PO3

CODE No.: 19BT50407 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

RADAR ENGINEERING

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	What are the desirable pulse characteristics and the factors that govern them in a radar system?	6 Marks	L2	CO1	PO1
	b)	Compute the maximum detectable range of a radar system specified below: Operating wavelength = 3.5cm Peak pulse transmitted power = 400 kW. Minimum detectable power = 10^{-13} W. Capture area of the antenna = 6sq.m. Radar cross-sectional area of the target = 12sq.m.	6 Marks	L3	CO1	PO4
		(OR)				
2.	a)	Explain about the Integration of radar pulses.	6 Marks	L2	CO1	PO1
	b)	Define the following terms: i) PRF. ii) Unambiguous range.	6 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Explain the butterfly effect that is produced by MTI radar.	6 Marks	L2	CO1	PO1
	b)	An MTI radar is operating at 9GHz with a PRF of 2000pps. Calculate the first two lowest blind speeds of this radar. Derive the formula used.	6 Marks	L3	CO1	PO4
		(OR)				
4.	a)	"A simple MTI delay line canceller is an example of time domain filter". Why? Explain.	6 Marks	L2	CO1	PO2
	b)	An 8 GHz police radar measures a doppler frequency of 1565Hz from a car approaching the stationary police vehicle in an 70km/h speed limit zone. What should the police officer do?	6 Marks	L3	CO1	PO4
		UNIT-III				
5.	a)	Explain the block diagram of amplitude comparison mono pulse radar for two coordinate and explain its operation.	6 Marks	L2	CO2	PO1
	b)	Explain about sequential lobing technique, with the help of sketches.	6 Marks	L2	CO2	PO1
		(OR)				
6.	a)	Compare and contrast various types of tracking radars.	6 Marks	L4	CO2	PO2
	b)	Define the following terms: i) tracking range. ii) scattering patterns.	6 Marks	L1	CO2	PO1
		UNIT-IV				
7.	a)	What are the advantages of electronically steered phased array antennas?	6 Marks	L2	CO3	PO2
	b)	Explain the concept of false Alarm rate.	6 Marks	L2	CO3	PO1
		(OR)				
8.	a)	Briefly explain about various types of radar displays.	6 Marks	L2	CO3	PO1
	b)	Describe the working principle of CFAR receiver	6 Marks	L2	CO3	PO2

UNIT-V

9.	a)	Explain the principle of VOR with a neat block diagram.	6 Marks	L2	CO5	PO1
	b)	List out the salient features of VOR.	6 Marks	L2	CO5	PO2
		(OR)				
10.	a)	Explain the principle of DME with a neat block diagram.	6 Marks	L4	CO5	PO2
	b)	Explain the Instrument Landing Systems.	6 Marks	L2	CO5	PO2

CODE No.: 19BT50441 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

MICROPROCESSORS AND INTERFACING

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain about physical memory organization of 8086 with suitable block diagram.	6 Marks	L2	CO1	PO2
	b)	Explain the register organization of 8086 microprocessor.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	With a neat sketch, explain the function of BIU and EU of 8086 microprocessor.	6 Marks	L1	CO1	PO2
	b)	Explain the memory read operation with timing diagram in minimum mode.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Explain the interrupt response sequence of 8086 with a neat sketch.	6 Marks	L2	CO2	PO2
	b)	Write an assembly language program to find average of n numbers.	6 Marks	L3	CO2	PO3
		(OR)				
4.	a)	Write an assembly language program to find maximum and minimum numbers in a series of data.	6 Marks	L3	CO2	PO3
	b)	Explain the procedure for passing parameters to a macro.	6 Marks	L2	CO2	PO1
		UNIT-III				
5.	a)	Interface DAC with 8086 and write an assembly language program to generate a RAMP waveform.	6 Marks	L4	CO3	PO4
	b)	Explain in detail the operation of 8255 in Mode 1 configuration with an example.	6 Marks	L2	CO3	PO2
		(OR)				
6.	a)	Describe the procedure of interfacing static memories with a CPU. List the differences between static and dynamic RAM.	6 Marks	L2	CO3	PO2
	b)	Explain the interfacing of stepper motor with 8086 with a neat sketch.	6 Marks	L3	CO3	PO6
		UNIT-IV				
7.	a)	Explain the initialization sequence of 8259A.	6 Marks	L3	CO3	PO4
	b)	What is key de-bouncing? Show connections to interface a hexadecimal keypad to Intel 8086.	6 Marks	L2	CO3	PO5
		(OR)				
8.	a)	What is DMA data transfer? Explain different DMA data transfer schemes.	6 Marks	L2	CO3	PO5
	b)	Illustrate and explain the internal architecture of 8251 USART.	6 Marks	L2	CO3	PO5
		UNIT-V				
9.	a)	Explain different addressing modes used in 8051 with an example.	6 Marks	L1	CO4	PO2
	b)	Write an assembly language program to count the number of even numbers in a given array of size 10 elements.	6 Marks	L4	CO4	PO4
		(OR)				

10.	a)	Write an assembly language program to generate a pulse with a delay of 1msec on P2.5 using timer0 of 8051. Assume crystal frequency f=11.0592MHz.	6 Marks	L4	CO4	PO4
	b)	Explain the bit fields of TMOD and TCON registers of 8051.	6 Marks	L1	CO4	PO1

CODE No.: 19BT50442 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

PRINCIPLES OF COMMUNICATIONS

[Electrical and Electronics Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Define modulation. What are the need for modulation?	6 Marks	L2	CO1	PO2
	b)	What is meant by coherent detection? Explain about the coherent detection of DSB-SC Modulated wave.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Derive the expression for single tone Amplitude modulated wave.	6 Marks	L2	CO1	PO1
	b)	Explain the generation of SSB-SC wave using phase discrimination method with help of a neat functional diagram.	6 Marks	L3	CO1	PO2
		UNIT-II				
3.	a)	What is time division multiplexing? Explain the need of guard band and commutator-decommutator in Time division Multiplexing.	6 Marks	L1	CO1	PO2
	b)	Explain generation of PAM with neat sketches.	6 Marks	L2	CO1	PO4
		OR)				
4.	a)	Explain demodulation of Pulse Width Modulation wave.	6 Marks	L4	CO1	PO2
	b)	What is pulse position modulation? Explain how PPM can be generated from PWM with the help of waveforms.	6 Marks	L2	CO1	PO4
		UNIT-III				
5.	a)	Define the Quantization and show that the quantization error in PCM is $\Delta^2/12$.	6 Marks	L4	CO2	PO2
	b)	Draw the block diagram of delta modulator and explain each block with mathematical modeling.	6 Marks	L4	CO2	PO2
		(OR)				
6.	a)	A signal whose amplitude varies from 0 to 10V is band limited to 4k Hz and transmitted through the channel using 5 bit PCM. The sampling rate is 50% higher than the nyquist rate. Calculate all parameters of the PCM.	6 Marks	L4	CO2	PO2
	b)	Explain the encoding scheme used in DPCM scheme with block diagram description and mathematical modeling.	6 Marks	L1	CO2	PO1
		UNIT-IV				
7.	a)	Explain the generation and detection of BPSK and BFSK signal with neat block diagram and necessary waveforms.	6 Marks	L1	CO3	PO1
	b)	Derive the expression for the probability of error in Coherent FSK.	6 Marks	L1	CO3	PO3
		(OR)				
8.	a)	Explain the generation and detection of DPSK signal with necessary waveforms. Mention its Advantages clearly.	6 Marks	L4	CO3	PO2
	b)	Distinguish the different types of digital modulation scheme.	6 Marks	L1	CO3	PO1

UNIT-V

9.	a)	Explain the terms: i) Self information. ii) Entropy. iii) Information rate.	6 Marks	L1	CO4	PO1
	b)	A binary source with B (0)=0.25, B(1)=0.75 the binary source is extended in such a way to generate 3rd extension calculate the entropy of extended source $\mathbf{s^3}$ and verify using extension property.	6 Marks	L3	CO4	PO2
		(OR)				
10.	a)	Discrete memory less source emits 5 symbols with probability { 0.4, 0.2, 0.2, 0.1, 0.1}. Find code efficiency and redundancy using Huffman code.	6 Marks	L1	CO4	PO1
	b)	Explain clearly the Shannon-Fano code algorithm.	6 Marks	L2	CO4	PO1

CODE No.: 19BT50502 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

ARTIFICIAL INTELLIGENCE

[Computer Science and Engineering, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	How the AI improves the customer experience in shopping?	6 Marks	L2	CO1	PO1
	b)	Give the comparison between rationality and omniscience.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	With a neat structure, explain the intelligent agents of AI.	6 Marks	L1	CO1	PO1
	b)	What are the risks and benefits of AI?	6 Marks	L2	CO1	PO2

UNIT-II

3.	a)	Draw the graph with start nodes and child nodes from the table shown below. Apply Breadth first search algorithm and draw the state space graph (BFS Spanning tree) to find optimal solution to reach from A to G and show the steps.	6 Marks	L1	CO2	PO1

Start Node	A	A	B	C	C	D	E	F
Child Node	C	B	F	D	E	E	G	G

	b)	Draw the state space diagram of Hill Climbing algorithm and explain the different regions in it.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Demonstrate greedy best first search algorithm with suitable example.	6 Marks	L2	CO2	PO2
	b)	What id heuristic function? Explain its role and advantages in solving the problems.	6 Marks	L3	CO2	PO2

UNIT-III

5.	a)	Describe what you understand by the artificial intelligence technique, evolutionary strategies? Ensure you describe the mutation operator and the importance it plays.	6 Marks	L2	CO3	PO1
	b)	Explain the minimax search algorithm in detail.	6 Marks	L2	CO3	PO1
		(OR)				
6.	a)	How the Monte Carlo tree search strategy works? Explain with an example.	6 Marks	L1	CO3	PO2
	b)	What is alpha-beta pruning? Explain its working process.	6 Marks	L2	CO3	PO2

UNIT-IV

7.	a)	What is a Probabilistic Reasoning? What are the problem areas of Probabilistic Reasoning?	6 Marks	L1	CO4	PO2
	b)	A coin toss experiment with 3 biased coins, with the Probabilities shown in table and with the state transition probability 1/3 for each state. Find the most likely path for the observation sequence H HHH T H T TTT.	6 Marks	L2	CO4	PO2

	STATE1	STATE2	STATE3
P(H)	0.5	0.75	0.25
P(T)	0.5	0.25	0.75

(OR)

8.	a)	Write various knowledge representation issues. Provide the solution of any two issues.	6 Marks	L2	CO4	PO1
	b)	Draw a Bayesian network that contains 3 variables where the factorization of their joint probability distribution is P (A, B, C) = P(C | A, B)P(A)P(B).	6 Marks	L2	CO4	PO1

UNIT-V

9.	a)	What are the three critical tasks for designing and implementing transparent AI? Explain in detail.	6 Marks	L2	CO5	PO1
	b)	What is the impact of artificial intelligence on society?	6 Marks	L2	CO5	PO1

(OR)

10.	a)	What are the limitations of AI?	6 Marks	L1	CO5	PO2
	b)	Write a short note on alternative robotic frameworks.	6 Marks	L2	CO5	PO2

CODE No.: 19BT50505 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

ETHICAL HACKING

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Discuss in detail about the role of security and penetration testers with requirements for a typical ad.	8 Marks	L2	CO1	PO1
	b)	Discuss in detail about Penetration-Testing Methodologies.	4 Marks	L2	CO1	PO1
		(OR)				
2.		Discuss the different types of malicious software and explain what damage they can do to a system.	12 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Discuss in detail about various types of Application layer programs.	6 Marks	L2	CO1	PO1
	b)	Explain in detail about TCP/IP Protocol stack with a neat sketch.	6 Marks	L3	CO1	PO1
		(OR)				
4.	a)	Explain in detail about broad categorization of Human-based social engineering techniques.	6 Marks	L2	CO1	PO8
	b)	Discuss in detail about art of manipulation in social engineering with an example.	6 Marks	L3	CO1	PO6
		UNIT-III				
5.	a)	List out and describe the function of some of the many tools available for foot printing.	6 Marks	L2	CO2	PO1
	b)	Explain in detail about Domain Name System Zone Transfers.	6 Marks	L3	CO2	PO5
		(OR)				
6.	a)	List out and explain the types of scans that can be used for port scanning.	8 Marks	L3	CO2	PO5
	b)	List out and explain various types of HTTP methods.	4 Marks	L3	CO2	PO1
		UNIT-IV				
7.	a)	Discuss in detail about different types of passwords and list out the rules proposed by the EC Council while password creation.	6 Marks	L3	CO3	PO5
	b)	Explain the process of Cover Your Tracks and Erasing Evidence from system using various tools and techniques.	6 Marks	L3	CO3	PO1
		(OR)				
8.	a)	Explain the following terms. i) Performing Automated Password Guessing. ii) Defending Against Password Guessing.	6 Marks	L3	CO3	PO5
	b)	Illustrate the process of hiding files on a system so that they can be prevented from detection.	6 Marks	L3	CO3	PO1
		UNIT-V				
9.	a)	Discuss in detail about public key infrastructure.	8 Marks	L3	CO4	PO1
	b)	List out the several technologies used by firewalls in reducing the attacks.	4 Marks	L2	CO4	PO5
		(OR)				
10.		List out and explain in detail about various cryptographic attacks.	12 Marks	L2	CO4	PO1

CODE No.: 19BT51001 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

OPTOELECTRONICS AND LASER INSTRUMENTATION

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the structure of optical fiber and discuss the classification of optical fibers in detail.	6 Marks	L1	CO1	PO1
	b)	Define dispersion. Why is dispersion so important in optical transmission system?	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Discuss various types of losses in optical fibers.	6 Marks	L2	CO1	PO1
	b)	Write the requirements of light detectors. Differentiate PIN photo diode and avalanche photo diode with respect to their construction and working.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	With a neat sketch, explain the interferometric method of measurement of length.	6 Marks	L2	CO1	PO2
	b)	Illustrate with an example, the difference between an extrinsic and intrinsic fiber optic sensor.	6 Marks	L2	CO1	PO1
		(OR)				
4.	a)	Apply fiber grating sensors in real time applications and discuss in detail.	6 Marks	L3	CO2	PO2
	b)	Discuss about phase and polarization fiber sensors.	6 Marks	L2	CO1	PO2
		UNIT-III				
5.	a)	With the help of energy level diagram, explain how a molecular gas laser is used widely in industries for cutting and welding purpose.	6 Marks	L2	CO2	PO1
	b)	Define Q-switching. Analyze a Q-switched laser for obtaining energetic pulses from laser by modulation.	6 Marks	L3	CO2	PO2
		(OR)				
6.	a)	Explain the construction and working principle of solidstate laser with neat diagram.	6 Marks	L2	CO2	PO1
	b)	Differentiate liquid laser with gas laser.	6 Marks	L2	CO2	PO1
		UNIT-IV				
7.	a)	Explain in detail about the principle of laser welding and laser melting.	6 Marks	L1	CO3	PO1
	b)	Discuss the usage of different lasers in material processing applications in industries.	6 Marks	L2	CO2	PO1
		(OR)				
8.	a)	Explain how lasers are used in removal of tumors of vocal cards.	6 Marks	L2	CO3	PO6
	b)	Illustrate the application of lasers in treatment of eye tissues and diseases.	6 Marks	L3	CO3	PO6

UNIT-V

9.	a)	Using suitable technique, construct a hologram with four level laser.	6 Marks	L3	CO3	PO1
	b)	Discuss the operation of holographic interferometer in detail.	6 Marks	L2	CO4	PO2
		(OR)				
10.	a)	Analyze different opto-electronic modulators with respect to their working principle.	6 Marks	L2	CO4	PO1
	b)	Describe the application of electro optic planar waveguide in digital modulation.	6 Marks	L2	CO4	PO2

CODE No.: 19BT51041 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

PLC AND SCADA

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Compare discrete and analog I/O modules with respect to the type of input or output devices with which they can be used.	6 Marks	L3	CO1	PO1
	b)	Briefly describe each of the following PLC modes of operation: i) Program. ii) Test. iii) Run.	6 Marks	L3	CO1	PO1
		(OR)				
2.	a)	Describe the PLC scan sequence in detail.	6 Marks	L3	CO1	PO1
	b)	List any three standard PLC languages as defined by the International Standard for Programmable Controllers, and give a brief description of each.	6 Marks	L3	CO1	PO1

UNIT-II

3.		A pump is to be used to fill two storage tanks. The pump is manually started by the operator from a start/stop station. When the first tank is full, the control logic must be able to automatically stop flow to the first tank and direct flow to the second tank through the use of sensors and electric solenoid valves. When the second tank is full, the pump must shut down automatically. Indicator lamps are to be included to signal when each tank is full. i) Draw a sketch of the process. ii) Prepare a typical PLC program for this control process.	12 Marks	L3	CO2	PO3
		(OR)				
4.	a)	Design a PLC program and prepare a typical I/O connection diagram and ladder logic program for the following counter specifications. i) Counts the number of times a push button is closed. ii) Decrements the accumulated value of the counter each time a second push button is closed.	6 Marks	L3	CO2	PO3
	b)	Name the three forms of PLC counter instructions, and explain the basic operation of each.	6 Marks	L1	CO2	PO3

UNIT-III

5.	a)	Explain how the PLC handles overflow and negative numbers for the ADD and SUBTRACT functions.	6 Marks	L3	CO1	PO1
	b)	Apply not-equal-to COMPARE function, the output is to be on except when an input count is exactly 86.	6 Marks	L3	CO2	PO3
		(OR)				
6.	a)	Describe the operation of the SKIP function.	6 Marks	L3	CO1	PO1
	b)	Two part conveyor lines, A and B, feed a main conveyor line, M. A third conveyor line, R, removes rejected parts a short distance away from the main conveyor. Conveyors A, B and R have parts counters connected to them. Construct a PLC program to obtain	6 Marks	L3	CO1	PO1

the total parts output of main conveyor M.

UNIT-IV

7.		An RTU can gather data in the form of a discrete switch position. This is used for alarm and status monitoring. What three other forms of field data can be an RTU gather? Describe in detail.	12 Marks	L3	CO3	PO3
		(OR)				
8.	a)	Discuss about central control and navigation facilities used in SCADA system.	6 Marks	L2	CO3	PO3
	b)	Describe about how MTU message calls for Analog output of particular register.	6 Marks	L2	CO3	PO3

UNIT-V

9.		Explain in detail about how HMI applications and I/O servers are configured.	12 Marks	L3	CO3	PO3
		(OR)				
10.		Design of water treatment plant SCADA system using system graphic displays.	12 Marks	L3	CO3	PO3

CODE No.: 19BT51042 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

SENSORS AND SIGNAL CONDITIONING

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Define gauge factor of a strain gauge and derive the expression of gauge factor for metals and semiconductors.	4 Marks	L1	CO1	PO1
	b)	A resistance wire strain gauge having a nominal resistance of 350Ω is subjected to a strain of 500 microstrain. Find the change in value of resistance neglecting the Piezoresistive effect.	8 Marks	L1	CO1	PO1
		(OR)				
2.	a)	With neat schematic, explain the principle and working of Resistive temperature detector and thermistor.	4 Marks	L3	CO1	PO1
	b)	Demonstrate the following terms: i) Foil type strain gauges. ii) Semiconductor strain gauges.	8 Marks	L1	CO1	PO2
		UNIT-II				
3.	a)	Describe the construction and working of variable reluctance sensors.	6 Marks	L2	CO2	PO2
	b)	Explain the construction and working of synchro's and synchro resolvers.	6 Marks	L3	CO1	PO1
		(OR)				
4.	a)	Discuss the principle of working and applications of frequency response of capacitive sensors with a neat sketch.	6 Marks	L2	CO2	PO1
	b)	Explain the principle of any one of inductive transducer with necessary diagrams.	6 Marks	L3	CO2	PO1
		UNIT-III				
5.	a)	Discuss about the measurement of temperature using radiation sensors.	4 Marks	L2	CO2	PO3
	b)	What are the basic characteristics of pyroelectric sensors? Explain the working principle with a neat sketch.	8 Marks	L1	CO2	PO6
		(OR)				
6.	a)	With neat schematic, explain the principle and working of magnetostrictive sensor.	6 Marks	L2	CO2	PO1
	b)	Describe the properties of materials used for piezoelectric transducers. Derive the expressions for voltage and charge sensitivities.	6 Marks	L2	CO2	PO1
		UNIT-IV				
7.	a)	What are optical fibers? Show how the fiber optic sensors are constituted for measuring linear and rotary displacement, with necessary diagrams.	6 Marks	L1	CO3	PO1
	b)	Describe the basics of a Semiconductor gas detector and explain its usefulness in chemical analysis.	6 Marks	L2	CO3	PO1
		(OR)				

8.	a)	What are biosensors? List their applications. Illustrate the structure of biosensor.	6 Marks	L1	CO3	PO1
	b)	Explain the construction and working of ultrasonic sensors.	6 Marks	L3	CO3	PO1

UNIT-V

9.	a)	With a neat block diagram, explain in detail about chopper amplifier.	6 Marks	L2	CO4	PO2
	b)	Describe the construction and working of Infrared Pyrometers. List their fields of application, advantages and disadvantages.	6 Marks	L3	CO4	PO2

(OR)

10.	a)	Discuss about the measurement of linear and angular displacement using capacitive transducers with neat sketch.	5 Marks	L2	CO2	PO1
	b)	Demonstrate the following terms: i) Push-pull bridge for signal conditioning. ii) Instrumentation amplifier.	7 Marks	L2	CO4	PO2

CODE No.: 19BT51201 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

DATA WAREHOUSING AND DATA MINING

[Information Technology]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Describe the role of concept hierarchies in data mining.	6 Marks	L2	CO1	PO1
	b)	Explain multidimensional data model with a neat diagram.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Differentiate ROLAP, MOLAP and HOLAP.	6 Marks	L5	CO1	PO1
	b)	List out the OLAP operations and explain the same with an example.	6 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Define Data Mining. Describe the important tasks of data mining.	6 Marks	L1	CO1	PO2
	b)	What are the types of data? Differentiate among structured and unstructured data with suitable examples.	6 Marks	L1	CO1	PO2
		(OR)				
4.	a)	Explain the steps for data preprocessing with an example.	6 Marks	L2	CO2	PO2
	b)	Explain various measures of similarity and dissimilarity.	6 Marks	L2	CO2	PO2
		UNIT-III				
5.	a)	Elaborate the steps for improving the efficiency of Apriori algorithm.	6 Marks	L6	CO3	PO1
	b)	Explain FP-Growth algorithm for suitability of mining frequent patterns.	6 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Describe various error measures with respect to computation of classification accuracy.	6 Marks	L2	CO3	PO2
	b)	Discuss Back propagation algorithm for classification with an example.	6 Marks	L6	CO3	PO2
		UNIT-IV				
7.		Write short notes on: i) K-Means. ii) DBSCAN.	12 Marks	L2	CO4	PO2
		(OR)				
8.	a)	What is a cluster? Discuss in detail Partition-based clustering techniques.	6 Marks	L1	CO4	PO2
	b)	Describe various outlier handling methods.	6 Marks	L2	CO4	PO3
		UNIT-V				
9.	a)	How data mining is useful for the society? Explain in brief.	6 Marks	L1	CO5	PO2
	b)	Explain the trends of data mining.	6 Marks	L2	CO5	PO2
		(OR)				
10.	a)	Discuss about multimedia mining in brief.	6 Marks	L6	CO5	PO2
	b)	Explain about spatial mining.	6 Marks	L2	CO5	PO2

CODE No.: 19BT51202 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

WEB TECHNOLOGIES

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Create a simple HTML page which demonstrates the use of various types of lists.	6 Marks	L6	CO1	PO1
	b)	Explain the drag and drop feature in HTML5 with suitable example.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Explain the following tags in detail with example. i) Table. ii) Form iii. Frame.	6 Marks	L2	CO1	PO1
	b)	Explain the following HTML tags with suitable example: i) <font> . ii) <meta>. iii) <p> . iv) <video>.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Explain the following terms related to CSS with examples. i) Font-size. ii) Font-weight. iii) Text-decoration. iv) Text-transform. v) Padding. vi) Border style.	6 Marks	L2	CO2	PO2
	b)	Explain absolute and relative positioning elements using Z-index property with suitable example.	6 Marks	L2	CO2	PO2
		(OR)				
4.	a)	Explain image maps and animations with example.	6 Marks	L1	CO2	PO2
	b)	Explain about JQuery selectors with suitable example.	6 Marks	L2	CO2	PO2
		UNIT-III				
5.	a)	Create badges as numerical indicators of how many items are associated with a link.	6 Marks	L6	CO3	PO1
	b)	Develop a mobile optimized website for displaying the images using responsive classes.	6 Marks	L5	CO6	PO6
		(OR)				
6.	a)	Develop Contact Us Web page using the grid system in bootstrap.	6 Marks	L5	CO6	PO6
	b)	Develop a predefined alert messages web page using bootstrap.	6 Marks	L5	CO3	PO1
		UNIT-IV				
7.	a)	Develop a PHP code to implement multi-level inheritance.	6 Marks	L5	CO4	PO3
	b)	Demonstrate the implementation of Object Cloning in PHP.	6 Marks	L3	CO4	PO4
		(OR)				
8.	a)	Explain how to create functions in PHP with example.	6 Marks	L2	CO4	PO3
	b)	Demonstrate OOP principles with suitable example using PHP.	6 Marks	L3	CO4	PO4
		UNIT-V				
9.	a)	Explain with example how the validation of forms is done using PHP.	6 Marks	L2	CO5	PO1
	b)	Demonstrate cookies and session handlers using PHP.	6 Marks	L3	CO5	PO5
		(OR)				
10.	a)	Explain how to interact with the database in PHP using MySQL.	6 Marks	L2	CO6	PO1
	b)	What is prepared statement? Explain in detail with the suitable example.	6 Marks	L1	CO6	PO6

❀ ❀ ❀

CODE No.: 19BT51204 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

LINUX PROGRAMMING

[Computer Science and Engineering, Information Technology]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Compare and contrast the cmp command and comm Command	6 Marks	L3	CO1	PO3
	b)	Define sed utility. Explain two formats of the sed command and address types with examples.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Specify the usage of following commands with an example. i) cat. ii) diff .	6 Marks	L2	CO1	PO1
	b)	Compare and contrast rmdir and rm commands working with suitable examples.	6 Marks	L3	CO1	PO3
		UNIT-II				
3.	a)	Illustrate the significance of Process execution and Quoting shell meta characters.	6 Marks	L2	CO2	PO2
	b)	Explain case structure in shell script with suitable example.	6 Marks	L4	CO2	PO4
		(OR)				
4.	a)	Write a shell script for given year is leap year or not.	6 Marks	L4	CO2	PO4
	b)	Summarize the loop control structures used in bash with examples.	6 Marks	L4	CO2	PO4
		UNIT-III				
5.	a)	Differentiate soft link and hard link with examples.	6 Marks	L2	CO3	PO2
	b)	Demonstrate these system calls with syntax. i) open(). ii) read().	6 Marks	L2	CO3	PO4
		(OR)				
6.	a)	Illustrate the working of following system calls with examples. i) chmod( ). ii) getcwd().	6 Marks	L2	CO3	PO2
	b)	Write a C Program to copy the contents of one file to another file.	6 Marks	L3	CO3	PO1
		UNIT-IV				
7.	a)	Illustrate the working of exec family of library functions with examples.	6 Marks	L2	CO4	PO2
	b)	Explain the concept of process creation and process termination with suitable example.	6 Marks	L1	CO4	PO2
		(OR)				
8.	a)	Differentiate between reliable signals and unreliable signals.	6 Marks	L2	CO4	PO1
	b)	Illustrate the concept of the orphan process.	6 Marks	L4	CO4	PO2
		UNIT-V				
9.	a)	Define usage of pipe and how IPC can be implemented using pipes.	6 Marks	L2	CO5	PO1
	b)	Differentiate the host byte and network byte ordering addresses.	6 Marks	L2	CO5	PO1
		(OR)				
10.	a)	Explain briefly about the following socket APIs with clear syntax: i) socket ( ). ii) bind( ).	6 Marks	L3	CO5	PO3
	b)	Define FIFO and how FIFO's are called as named pipes.	6 Marks	L2	CO5	PO1

CODE No.: 19BT51205 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

MOBILE COMPUTING

[Information Technology]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Write a short note on GPRS.	6 Marks	L2	CO1	PO1
	b)	Demonstrate the process of call Handover when a mobile station moves.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	List and explain the novel application of mobile devices.	6 Marks	L2	CO1	PO1
	b)	Explain in detail about protocol layers in DECT.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Examine Medium Access Control in Near and Far Terminal.	6 Marks	L4	CO2	PO2
	b)	Explain Frequency Hopping Spread Spectrum in detail.	6 Marks	L2	CO2	PO2
		(OR)				
4.	a)	List the advantages and disadvantages of Spread Spectrum based wireless System.	6 Marks	L1	CO2	PO1
	b)	Explain WCDMA 3G Communication Standards.	6 Marks	L2	CO2	PO5
		UNIT-III				
5.	a)	Illustrate the working of mobile IP with Architecture.	6 Marks	L3	CO3	PO2
	b)	Explain in detail about IP sec suite of protocols.	6 Marks	L2	CO3	PO2
		(OR)				
6.	a)	Determine the functions of home and foreign agent in Mobile IP.	6 Marks	L5	CO3	PO1
	b)	How does VoIP function? Explain in detail.	6 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	Explain Indirect TCP. What are its advantages and disadvantages?	6 Marks	L2	CO3	PO1
	b)	Discover the special requirements in transport layer protocols in case of 2.5G/3G wireless networks.	6 Marks	L4	CO3	PO2
		(OR)				
8.	a)	Describe with a diagram the fast retransmission/fast recovery in mobile network.	6 Marks	L4	CO3	PO2
	b)	Describe Snooping TCP. What are the advantages and disadvantages of Snooping TCP?	6 Marks	L2	CO3	PO1
		UNIT-V				
9.	a)	Explain briefly the layers of WAP.	6 Marks	L2	CO4	PO1
	b)	List and explain ZigBee Features.	6 Marks	L4	CO4	PO1
		(OR)				
10.	a)	Explain in detail about WDP.	6 Marks	L2	CO4	PO1
	b)	List the advantages of WLAN.	6 Marks	L4	CO4	PO1

CODE No.: 19BT51207 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

AI IN HEALTHCARE

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	How Artificial Intelligence can bring improvements in Health Care? Explain.	6 Marks	L2	CO1	PO1
	b)	What are the benefits and risks of Artificial Intelligence in Healthcare?	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	"Artificial Intelligence ***Vs*** Human Intelligence" – which has good results in Health care? Justify?	6 Marks	L2	CO1	PO2
	b)	Discuss about the terminology Artificial Intelligence and Neural Networks.	6 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Discuss about artificial intelligence in preventive healthcare.	6 Marks	L1	CO2	PO5
	b)	Describe the present state and future state of Artificial Intelligence in healthcare for Surgery and Anesthesiology.	6 Marks	L3	CO2	PO2
		(OR)				
4.	a)	Describe the status of Artificial Intelligence in any two Healthcare specialties.	6 Marks	L1	CO2	PO1
	b)	Describe the present state and future state of Artificial Intelligence in healthcare for Pharmacy and Dermatology.	6 Marks	L1	CO2	PO1
		UNIT-III				
5.		Demonstrate the role of Microsoft in Artificial Intelligence in healthcare applications.	12 Marks	L3	CO3	PO5
		(OR)				
6.	a)	What is the significance of Face book and Baidu in Artificial intelligence in Health care.	6 Marks	L2	CO3	PO6
	b)	Demonstrate the role of IBM Watson in healthcare applications.	6 Marks	L2	CO3	PO5
		UNIT-IV				
7.	a)	How artificial intelligence help in remote monitoring in healthcare?	6 Marks	L3	CO4	PO6
	b)	Describe the following terminology in healthcare: Block chain and Robots.	6 Marks	L2	CO4	PO5
		(OR)				
8.	a)	Briefly discuss about Incentivized wellness and smart implantable in healthcare.	6 Marks	L2	CO4	PO5
	b)	Discuss about the usage of drones, smart places and smart hospitals in Healthcare.	6 Marks	L2	CO4	PO5

UNIT-V

9.	a)	Describe about delivering a scalable and engaging digital Therapy case study with examples.	6 Marks	L3	CO5	PO5
	b)	Demonstrate about the outcomes of a digitally delivered, Low carbohydrate, Type 2 Diabetes self-Management with examples.	6 Marks	L3	CO5	PO5
		(OR)				
10.	a)	Discuss the impact of Big data Analytics in diagnosing Disease Risk from patient data.	6 Marks	L2	CO5	PO5
	b)	Describe the benefits of using Augmented and Virtual reality for Epilepsy.	6 Marks	L2	CO5	PO5

CODE No.: 19BT51209 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

IoT ARCHITECTURE AND PROTOCOLS

[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Discuss the main design principles in developing an IoT System. Explain.	6 Marks	L2	CO1	PO1
	b)	Write about devices and gateways used in IoT with suitable examples.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	How does an M2M gateway work in an IoT System? Explain.	6 Marks	L2	CO1	PO1
	b)	Write about XaaS in detail.	6 Marks	L4	CO1	PO2
		UNIT-II				
3.	a)	With a neat sketch, explain the IoT reference model.	6 Marks	L3	CO2	PO2
	b)	Illustrate steps of design methodology for a Smart Home IoT application.	6 Marks	L4	CO2	PO2
		(OR)				
4.	a)	Write in detail about Smart Traffic Control application and map IoT concepts to develop a deployment view of the System.	6 Marks	L4	CO2	PO2
	b)	Explain the devices and networks required for implementing IoT solutions in real-world.	6 Marks	L2	CO2	PO2
		UNIT-III				
5.	a)	Illustrate on Bluetooth technology used in IoT.	6 Marks	L4	CO3	PO1
	b)	Compare and contrast 6LoWPAN, 6TiSCH and 6Lo.	6 Marks	L2	CO3	PO2
		(OR)				
6.	a)	Draw MAC frame structure of IEEE802.15.4 and explain in detail.	6 Marks	L2	CO3	PO1
	b)	Explain the working of CARP with an example in detail.	6 Marks	L1	CO3	PO1
		UNIT-IV				
7.	a)	Illustrate the roles and functionality of the MQTT protocol with a neat diagram.	6 Marks	L4	CO4	PO1
	b)	Discuss about SCADA protocol translation in detail.	6 Marks	L2	CO4	PO1
		(OR)				
8.	a)	Write short notes on: i) XMPP. ii) DDS.	6 Marks	L2	CO4	PO1
	b)	Define Web socket. Give examples of generic web-based Protocols.	6 Marks	L2	CO4	PO2
		UNIT-V				
9.	a)	Mention in detail about the security considerations in MAC802.11ah.	6 Marks	L2	CO5	PO1
	b)	Illustrate the IoT Architecture for Smart City.	6 Marks	L4	CO5	PO2
		(OR)				
10.	a)	What are the main security challenges and issues in IoT? Explain.	6 Marks	L2	CO5	PO3
	b)	Describe the methodology to design an Energy Management System using IoT.	6 Marks	L4	CO5	PO2

CODE No.: 19BT51501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

MODERN CRYPTOGRAPHY

[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain encryption and decryption process of affine cipher.	6 Marks	L2	CO1	PO1
	b)	Encrypt the message "**meet me at the usual place at ten rather than eight o clock**" using the Hill cipher with the key $\begin{pmatrix} 9 & 4 \\ 5 & 7 \end{pmatrix}$. Show your calculations and the result.	6 Marks	L4	CO1	PO3
		(OR)				
2.	a)	Explain Random and Pseudo-Random-Sequence Generation.	6 Marks	L2	CO1	PO3
	b)	What is a One-Way hash function? Explain briefly hash function properties.	6 Marks	L3	CO2	PO3
		UNIT-II				
3.	a)	What is a Stream cipher? How it differs from block cipher mode of encryption?	6 Marks	L1	CO2	PO4
	b)	Compare different block cipher modes of symmetric algorithms.	6 Marks	L4	CO2	PO5
		(OR)				
4.	a)	What is PKI? Explain with a suitable example.	6 Marks	L2	CO2	PO1
	b)	Design a key generation mechanism using random bit strings.	6 Marks	L3	CO3	PO3
		UNIT-III				
5.	a)	State and prove Euler's theorem.	6 Marks	L2	CO4	PO1
	b)	Explain the steps of primality test using Lehmann method.	6 Marks	L2	CO4	PO1
		(OR)				
6.	a)	Describe RSA algorithm. Perform encryption/decryption using RSA algorithm with instances: p=3; q=11,e=7;m=5 .	6 Marks	L4	CO3	PO5
	b)	Discuss the security of DES.	6 Marks	L2	CO4	PO3
		UNIT-IV				
7.	a)	Briefly explain one way hash functions using Symmetric Block algorithms.	6 Marks	L2	CO5	PO1
	b)	Explain Snefru hash function.	6 Marks	L4	CO5	PO5
		(OR)				
8.	a)	Describe the major steps in Secure Hash algorithm.	6 Marks	L2	CO5	PO1
	b)	Differentiate MD4 and MD5 algorithms.	6 Marks	L4	CO5	PO2
		UNIT-V				
9.	a)	Discuss the process of digital signature signing and verification process.	6 Marks	L2	CO6	PO1
	b)	Explain SCHNORR authentication and encryption algorithm with an example.	6 Marks	L2	CO6	PO1
		(OR)				
10.	a)	Explain the steps involved in Diffie Hellman key exchange algorithm.	6 Marks	L2	CO6	PO1
	b)	Discuss Shamir's Three-Pass protocol.	6 Marks	L2	CO6	PO1

❀ ❀ ❀

CODE No.: 19BT51505 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

SOFTWARE TESTING

[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Describe the Goals and Psychology of testing.	6 Marks	L2	CO1	PO1
	b)	With a neat sketch, explain the life cycle of software testing.	6 Marks	L3	CO1	PO1
		(OR)				
2.	a)	List out the Verification and Validation activities and explain.	6 Marks	L3	CO1	PO2
	b)	What is the use of Test strategy? Explain with an example.	6 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	What is the need of White-Box testing? Explain.	6 Marks	L1	CO2	PO1
	b)	What is meant by mutation testing? Explain with an example.	6 Marks	L3	CO2	PO2
		(OR)				
4.	a)	What are the differences between White-Box testing and Black-Box testing?	6 Marks	L2	CO2	PO1
	b)	Describe briefly about Boundary Value analysis.	6 Marks	L2	CO2	PO2
		UNIT-III				
5.	a)	What are the guidelines for test administration and estimation?	6 Marks	L2	CO3	PO3
	b)	Differentiate Test plan and Quality plan.	6 Marks	L3	CO3	PO2
		(OR)				
6.	a)	Describe the process of writing templates for Test Cases and Test Scripts.	6 Marks	L1	CO3	PO1
	b)	What test processes need improvement? Explain.	6 Marks	L2	CO3	PO2
		UNIT-IV				
7.	a)	"Regression Testing produces Quality software". Justify the statement.	6 Marks	L2	CO4	PO4
	b)	Describe the classification of Software Metrics.	6 Marks	L2	CO4	PO4
		(OR)				
8.	a)	What are different types of Regression testing? Define Regression Test problem.	6 Marks	L2	CO4	PO2
	b)	Discuss any two regression techniques to measure to software quality.	6 Marks	L2	CO4	PO3
		UNIT-V				
9.	a)	What are the parameters to be considered to select the testing tools?	6 Marks	L2	CO5	PO2
	b)	How the testing tools are categorized? Explain.	6 Marks	L3	CO5	PO4
		(OR)				
10.	a)	What are different costs incurred in Testing Tools?	6 Marks	L2	CO5	PO4
	b)	Give an overview on some commercial Testing Tools.	6 Marks	L2	CO5	PO2

❀ ❀ ❀

CODE No.: 19BT60314 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

OPTIMIZATION TECHNIQUES
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the statement of an optimization problem.	6 Marks	L3	CO1	PO1
	b)	Enlist various engineering applications of optimization.	6 Marks	L2	CO1	PO1
		(OR)				
2.		Solve the following non linear programming problem using the Lagrange multipliers method. Minimize $Z = X_1^2 + X_2^2 + X_3^2$ Subject to the constraints : $4X_1 + X_2^2 + 2X_3 = 14$ $X_1, X_2 \& X_3 \geq 0$	12 Marks	L3	CO1	PO1 PO2
		UNIT-II				
3.		Solve the following Linear Programming Problem by using Simplex method. Maximize $Z = 10X_1 + 15X_2 + 20X_3$ Subject to the constraints : $2X_1 + 4X_2 + 6X_3 \leq 24$, $3X_1 + 9X_2 + 6X_3 \leq 30$ $X_1, X_2 \& X_3 \geq 0$	12 Marks	L3	CO2	PO1 PO2
		(OR)				
4.		Solve the following Linear Programming Problem by using Dual Simplex Method. Minimize $Z = 2X_1 + 3X_2$ Subject to the constraints : $2X_1 + 2X_2 \leq 30$, $X_1 + 2X_2 \geq 10$ $X_1, X_2 \geq 0$	12 Marks	L3	CO2	PO1 PO2
		UNIT-III				
5.		Minimize the function $f(X_1, X_2) = X_1 - X_2 + 2X_1^2 + 2X_1X_2 + X_2^2$, starting from point $X_1 = \{0\ 0\}$ using Steepest descent method.	12 Marks	L3	CO3	PO1 PO2
		(OR)				
6.		Minimize the function $f(X_1, X_2) = X_1^2 - X_2^2 + X_1 - X_2$, starting from point $X_1 = \{0\ 0\}$ using Powell's Method.	12 Marks	L3	CO3	PO1 PO2
		UNIT-IV				
7.		Use dynamic programming approach to solve the following Linear Programming Problem. Maximize $Z = X_1 + 9X_2$ Subject to the constraints : $2X_1 + X_2 \leq 25$, $X_2 \leq 11$ $X_1 \& X_2 \geq 0$	12 Marks	L3	CO4	PO1 PO2 PO3
		(OR)				

8.	A distance network consists of nine nodes which are distributed as shown in the following table. Find the shortest path from node 1 to node 9 and the corresponding distance.	12 Marks	L3	CO4	PO1 PO2 PO3

Arc	Distance
1 - 2	2
1 - 3	2
1 - 4	1
2 - 6	4
3 - 7	5
3 - 5	8

Arc	Distance
4 - 5	3
5 - 9	5
6 - 8	1
7 - 8	4
8 - 9	3

UNIT-V

9.	Explain the steps involved in algorithm of Particle Swarm Optimization with a flow chart.	12 Marks	L2	CO5	PO1 PO2 PO3

(OR)

10.	Explain Mathematical Modeling of Genetic algorithm with an example.	12 Marks	L2	CO5	PO1 PO2 PO3

CODE No.: 19BT60502 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

MACHINE LEARNING

[Information Technology]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	List the steps that are involved in designing a learning system and explain about choosing the training experience with an example.	6 Marks	L2	CO3	PO1
	b)	Illustrate Find S algorithm over Water Sport concept. Training instances given below.	6 Marks	L3	CO3	PO2

Day	Sky	Airtemp	Humidity	Wind	Water	Forecast	WaterSport
1.	Sunny	Warm	Normal	Strong	Warm	Same	Yes
2.	Sunny	Warm	High	Strong	Warm	Same	Yes
3.	Rainy	Cold	High	Strong	Warm	Change	No
4.	Sunny	Warm	High	Strong	Cool	Change	Yes

(OR)

2.	a)	Discuss concept learning as search with respect to general to specific ordering of hypothesis.	6 Marks	L2	CO1	PO1
	b)	Explain the different issues in machine learning.	6 Marks	L2	CO2	PO2

UNIT-II

3.	a)	Discuss about inductive bias in decision tree learning.	6 Marks	L2	CO2	PO1
	b)	List the issues in decision tree learning and explain them.	6 Marks	L2	CO2	PO1

(OR)

4.	a)	Construct decision trees to represent the Boolean functions for Play Tennis. (Outlook = Sunny A Humidity = Normal). V (Outlook = Overcast). v (Outlook = Rain A Wind = Weak).	6 Marks	L4	CO2	PO3
	b)	Explain about Large margin principle in SVM.	6 Marks	L2	CO2	PO2

UNIT-III

5.	a)	Discuss the appropriate problems for neural network learning.	6 Marks	L2	CO4	PO3
	b)	Demonstrate under what conditions the perceptron rule fails and it becomes necessary to apply the delta rule.	6 Marks	L2	CO4	PO4

(OR)

6.	a)	Explain in detail about the representational power of feed forward neural networks with respect to back propagation.	6 Marks	L2	CO4	PO1
	b)	Distinguish between hypothesis space search and inductive bias in back propagation algorithm.	6 Marks	L2	CO4	PO2

UNIT-IV

7.	a)	Explain belief network and conditional independence with an example.	6 Marks	L2	CO2	PO1
	b)	Write about maximum likelihood hypothesis for predicting probabilities.	6 Marks	L2	CO2	PO1

(OR)

8.	a)	Prove that how maximum likelihood (Bayesian learning) can be used in any learning algorithms that are used to minimize the squared error between actual hypotheses and predicted output hypothesis.	6 Marks	L3	CO2	PO2
	b)	Explain about Bayes optimal classifier.	6 Marks	L2	CO5	PO6

UNIT-V

9.	a)	Explain in detail about temporal difference learning.	6 Marks	L2	CO2	PO1
	b)	Discuss the learning tasks and Q learning in the context of reinforcement learning.	6 Marks	L2	CO2	PO1

(OR)

10.	a)	Explain K nearest Neighbor learning algorithm.	6 Marks	L2	CO2	PO1
	b)	Write about case-based reasoning.	6 Marks	L2	CO2	PO2

CODE No.: 19BT71202 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Regular Examinations January – 2022

MOBILE APPLICATION DEVELOPMENT
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Discuss in detail about mobile web presence.	6 Marks	L2	CO1	PO1
	b)	List out the various scenarios that would say where a native app would be the best solution.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Explain in brief the various benefits of a mobile app.	8 Marks	L2	CO1	PO1
	b)	List out and explain the few reasons why users might need access to mobile content.	4 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	Explain in detail about the two techniques to handle changes in screen orientation and illustrate in detail about anchoring views.	6 Marks	L1	CO1	PO1
	b)	List out the various common attributes used in views and view groups.	6 Marks	L1	CO1	PO1
		(OR)				
4.		Discuss in detail about linking activities using intents.	12 Marks	L2	CO1	PO1
		UNIT-III				
5.	a)	List out and explain in detail about basic views that you can use to design the UI for Android applications.	8 Marks	L3	CO2	PO2
	b)	List out and define main types of menus in android.	4 Marks	L2	CO2	PO5
		(OR)				
6.	a)	Discuss in detail about using picker views.	6 Marks	L2	CO2	PO1
	b)	List out and explain the various image views in detail.	6 Marks	L3	CO2	PO5
		UNIT-IV				
7.	a)	Discuss in detail about Consuming Web Services Using HTTP.	8 Marks	L2	CO3	PO3
	b)	Identify and explain the process of sending SMS messages using intent.	4 Marks	L3	CO3	PO5
		(OR)				
8.	a)	Explain the process of sending SMS messages programmatically in detail.	6 Marks	L3	CO3	PO5
	b)	Discuss in detail about preventing the messaging application from receiving a message.	6 Marks	L2	CO3	PO3
		UNIT-V				
9.	a)	Illustrate the process of performing long-running tasks in a service in brief.	6 Marks	L3	CO4	PO5
	b)	Explain in detail about binding activities to services with an example.	6 Marks	L3	CO4	PO3
		(OR)				
10.	a)	Discuss in brief about establishing communication between a service and an activity.	6 Marks	L2	CO4	PO3
	b)	Discuss in detail about understanding threading in android application.	6 Marks	L3	CO4	PO5

❀ ❀ ❀

CODE No.: 19BT4BS01 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

MATERIAL SCIENCE

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		Differentiate advanced materials with engineering materials with suitable applications.	12 Marks	L2	CO1	PO1
		(OR)				
2.		Summarize the processing, properties and applications of polymers and ceramics.	12 Marks	L2	CO1	PO1
		UNIT-II				
3.		What are Laminated composite materials? Explain the Laminated composite materials with suitable structures and applications.	12 Marks	L3	CO2	PO1
		(OR)				
4.	a)	Briefly describe the classification and application of structural composites in commercial air crafts.	8 Marks	L2	CO2	PO1
	b)	List four reasons why glass fibers are most commonly used for reinforcement.	4 Marks	L1	CO2	PO1
		UNIT-III				
5.		Discuss in detail the characteristics of shape memory alloys and applications of shape memory alloys.	12 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Elaborate on smart materials.	5 Marks	L6	CO3	PO1
	b)	List the properties and advance applications of electro-rheostatic and magneto static materials	7 Marks	L1	CO3	PO1
		UNIT-IV				
7.		What are nano materials? Describe the fabrication of nano materials by using any suitable technique.	12 Marks	L2	CO4	PO1
		(OR)				
8.		Describe about biomimetic materials and their modern applications in the field of technology.	12 Marks	L2	CO4	PO1
		UNIT-V				
9.		Explain the processing and potential applications of functionally graded materials.	12 Marks	L2	CO5	PO1
		(OR)				
10.	a)	Illustrate functionally graded fiber cement as structural material.	6 Marks	L2	CO5	PO1
	b)	Identify any six applications of functionally graded materials in optoelectronic devices.	6 Marks	L3	CO5	PO1

CODE No.: 19BT4HS04 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

ENTREPRENEURSHIP FOR MICRO, SMALL AND MEDIUM ENTERPRISES

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	Discuss the concept of entrepreneurship as Leadership, Risk taking, Decision- making and Business Planning.	12 Marks	L2	CO1	PO1
	(OR)				
2.	Explain the entrepreneurial decision process in Entrepreneurship development.	12 Marks	L2	CO2	PO2

UNIT-II

3.	Enumerate the role of incubation centers for promoting entrepreneurships and start-ups.	12 Marks	L1	CO1	PO1
	(OR)				
4.	Discuss the concept of business plan. And discover its significant role in micro small and medium enterprises.	12 Marks	L2	CO2	PO2

UNIT-III

5.	Describe the essential elements that are required for small enterprises.	12 Marks	L2	CO1	PO1
	(OR)				
6.	Execute the objectives of Micro Enterprises.	12 Marks	L3	CO2	PO2

UNIT-IV

7.	List out the main functions of SFCs. Explain.	12 Marks	L2	CO1	PO1
	(OR)				
8.	What is NIESBUD? State the role of NIESBUD in India.	12 Marks	L1	CO2	PO2

UNIT-V

9.	Examine the role of Bharatiyamahila bank for encouraging women entrepreneurs.	12 Marks	L4	CO1	PO1
	(OR)				
10.	Define rural entrepreneurship. And demonstrate the need for rural entrepreneurship in India.	12 Marks	L3	CO2	PO2

CODE No.: 19BT4HS07 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

INDIAN ECONOMY

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering,]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

	UNIT-I				
1.	Define Indian Economy and explain its importance in economic development.	12 Marks	L2	CO1	PO1
	(OR)				
2.	Compare and contrast between Law of demand and Law of supply.	12 Marks	L2	CO1	PO1
	UNIT-II				
3.	Examine the importance of material selection of a product.	12 Marks	L2	CO1	PO6
	(OR)				
4.	Outline the design selection process with your own example.	12 Marks	L2	CO1	PO6
	UNIT-III				
5.	Examine the role of engineers in employment and inclusive growth.	12 Marks	L2	CO1	PO6
	(OR)				
6.	Compare and contrast between five year plans and NITI aayog in the development of economy in our country.	12 Marks	L2	CO1	PO6
	UNIT-IV				
7.	Demonstrate with your own examples the importance of time value of money.	12 Marks	L2	CO2	PO12
	(OR)				
8.	Explain cash flow diagram with your own examples.	12 Marks	L2	CO2	PO1
	UNIT-V				
9.	Compare between value analysis and value engineering.	12 Marks	L2	CO2	PO12
	(OR)				
10.	Demonstrate the procedure of value engineering in detail.	12 Marks	L2	CO1	PO1

CODE No.: 19BT4HS11 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

PROFESSIONAL ETHICS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Where and how do Moral problems arise in Engineering?	6 Marks	L2	CO1	PO1
	b)	List the steps involved in confronting Moral Dilemmas.	6 Marks	L2	CO1	PO1
		(OR)				
2.		"The three types of Inquiry influence the Engineering Ethics". Examine the given statement.	12 Marks	L2	CO3	PO8
		UNIT-II				
3.	a)	What do you understand by the terms: Utilitarianism and Virtue Ethics?	6 Marks	L2	CO3	PO8
	b)	Write a short note on: Duty Ethics and Deontology.	6 Marks	L2	CO3	PO8
		(OR)				
4.		Discuss briefly the competencies and expectations of a professional.	12 Marks	L4	CO2	PO2
		UNIT-III				
5.	a)	Explain briefly about engineering experiments.	6 Marks	L2	CO1	PO1
	b)	Explain briefly about standard experiments.	6 Marks	L2	CO1	PO1
		(OR)				
6.		"The responsibilities of engineers play a significant role in building a nation". Justify.	12 Marks	L4	CO2	PO2
		UNIT-IV				
7.	a)	Explain the concept of whistle blowing giving a suitable example.	6 Marks	L2	CO1	PO1
	b)	What is meant by Conflicts of Interest?	6 Marks	L2	CO1	PO1
		(OR)				
8.		"Professional rights can lead to conflicts of interest". Justify the given statement suggesting a few tips to solve.	12 Marks	L4	CO2	PO2
		UNIT-V				
9.	a)	Explain briefly the ethical aspects of corporate governance.	6 Marks	L2	CO3	PO8
	b)	Explain the role of engineers as expert witnesses.	6 Marks	L2	CO3	PO8
		(OR)				
10.		What is meant by 'morally creative leaders' and participation in professional societies?	12 Marks	L4	CO2	PO2

CODE No.: 19BT21501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Differentiate between Procedural Oriented and Object Oriented Languages.	6 Marks	L2	CO1	PO1
	b)	Write about Garbage Collection in Java.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Illustrate the usage of this keyword using an example program.	6 Marks	L2	CO1	PO1
	b)	Explain the following: i) class. ii) object. iii) constructor.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Develop a java program to implement Towers of Hanoi Problem.	6 Marks	L3	CO1	PO3
	b)	Analyze the concept of constructor overloading with an example program.	6 Marks	L2	CO2	PO2
		(OR)				
4.	a)	List and explain any four operators in java.	6 Marks	L1	CO1	PO1
	b)	Give the purpose of using the final keyword in java.	6 Marks	L1	CO1	PO1
		UNIT-III				
5.	a)	"Java supports reusability". Justify the statement.	6 Marks	L5	CO2	PO1
	b)	Write the process of creating and accessing a package.	6 Marks	L1	CO2	PO1
		(OR)				
6.	a)	Design a program to demonstrate multiple inheritance in java	6 Marks	L3	CO2	PO4
	b)	Explain the following: i) Abstract class. ii) Final keyword with inheritance.	6 Marks	L1	CO2	PO1
		UNIT-IV				
7.	a)	Develop a java program for producer consumer problem to illustrate the concept of multithreading.	6 Marks	L3	CO2	PO4
	b)	What is Java Collections Framework? List out some benefits of Collection framework.	6 Marks	L1	CO2	PO1
		(OR)				
8.	a)	Difference between Thread and Process in Java. How to implement Thread in Java?	6 Marks	L2	CO2	PO2
	b)	Develop a java program to read 20 marks and store them in an array. Define your own exception named wrong mark exception. Throw and catch this type of exception when a mark is (<0 and >100).	6 Marks	L3	CO2	PO3
		UNIT-V				
9.	a)	What is an Event? Explain the role of Event handler in AWT.	6 Marks	L1	CO3	PO1
	b)	Design and develop an Applet to receive the value of the parameter message from the html file and display it on the webpage.	6 Marks	L3	CO3	PO5
		(OR)				
10.	a)	Construct an anonymous inner class for handling mouse entered events into an Applet.	6 Marks	L3	CO3	PO3
	b)	List and explain any three Swing GUI Components.	6 Marks	L2	CO3	PO1

CODE No.: 19BT40403 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

LINEAR AND DIGITAL IC APPLICATIONS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	With relevant diagram illustrate the working principle of a Monostable multivibrator using 555 timer. Derive the expression of time delay.	6 Marks	L4	CO1	PO3
	b)	Describe the principle of operation of RC Phase shift oscillator using op-amp. Derive the condition for frequency of oscillations.	6 Marks	L2	CO1	PO8
		(OR)				
2.	a)	Describe the NE 565 PLL with relevant diagram and explain its working principle with states of PLL and make circuit connections to track the input signal.	6 Marks	L2	CO1	PO6
	b)	A PLL has a free running frequency of 500 KHz, the bandwidth of the LPF=10KHz. Will the PLL lock-in if f_i =60 KHz? What is the frequency of the VCO output?	6 Marks	L3	CO1	PO4
		UNIT-II				
3.	a)	Develop a First order Butter worth HPF using op-amp and plot the Frequency response.	6 Marks	L3	CO2	PO3
	b)	Design a first order low pass filter with a cut off frequency of 1KHz and a pass band gain of 2.	6 Marks	L3	CO2	PO4
		(OR)				
4.	a)	Examine the operation of a Dual slope Analog to Digital converter with relevant circuit diagram and conversion time graph.	8 Marks	L2	CO3	PO2
	b)	A 8- bit ADC outputs all 1's when Vi=5.1V. Find it's resolution and digital output when Vi=1.28V.	4 Marks	L3	CO3	PO4
		UNIT-III				
5.	a)	Differentiate initial and always statements.	6 Marks	L1	CO4	PO1
	b)	Explain the structure of various LOOP statements in Verilog HDL with examples.	6 Marks	L1	CO4	PO1
		(OR)				
6.	a)	Discuss system tasks and compiler directives available in Verilog HDL.	6 Marks	L1	CO4	PO1
	b)	Write Verilog HDL code for 4-to-1 Multiplexer Using Conditional Operators.	6 Marks	L2	CO5	PO2
		UNIT-IV				
7.	a)	With neat circuit diagram, explain the working of a 4-bit odd parity generator.	6 Marks	L2	CO5	PO1
	b)	Sketch the symbol, logic diagram & write Verilog HDL source code of 74x138 IC.	6 Marks	L2	CO5	PO6
		(OR)				

8.	a)	Design barrel shifter for 8-bit using three control inputs using multiplexers or shift registers.	6 Marks	L4	CO5	PO3
	b)	Write a Verilog code for full subtractor using two half subtractors and an OR Gate.	6 Marks	L2	CO5	PO1

UNIT-V

9.	a)	Examine the process to convert a D- flip-flop to J-K flip-flop. Write dataflow style Verilog HDL program.	6 Marks	L3	CO5	PO2
	b)	Design a 4-bit binary synchronous counter using IC 74 x 74. Write Verilog HDL program for this logic. Using data flow style.	6 Marks	L3	CO5	PO6

(OR)

10.	a)	Sketch the logic diagram of 74 x 194 4-bit universal shift register and develop a Verilog HDL module for the same.	6 Marks	L2	CO5	PO2
	b)	Develop MOD 16 Down ripple counter with D-flip-flops and explain its operation.	6 Marks	L3	CO5	PO4

CODE No.: 19BT40503 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

DESIGN AND ANALYSIS OF ALGORITHMS

[Information Technology]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

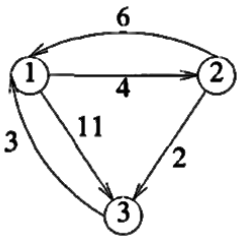
1.	a)	Demonstrate various types on complexities and Asymptotic notations with examples.	6 Marks	L2	CO1	PO1
	b)	Solve the recurrence relation and compute its complexity. $T(n) = 2T(n/2) + n$, if $n > 1$ $= 1$ otherwise	6 Marks	L4	CO1	PO2
		(OR)				
2.	a)	Define amortized analysis illustrate aggregate analysis with example.	6 Marks	L3	CO1	PO1
	b)	Apply Master's theorem on the following recurrence relation and find its complexity. $T(n)=8T(n/2) +1000n^2$	6 Marks	L4	CO1	PO2

UNIT-II

3.	a)	Illustrate SimpleUnion() and WeightedUnion() algorithms with an example.	4 Marks	L2	CO2	PO2
	b)	Consider the array of ten elements a[1:7] = (36, 25, 40, 2, 7, 80, 15). Sort these elements using Merge sort algorithm. Analyze its time and space complexity and represent in the form of recurrence relation.	8 Marks	L4	CO2	PO2
		(OR)				
4.	a)	Analyze and compare the complexities of recursive and iterative versions of binary search algorithm.	6 Marks	L4	CO2	PO2
	b)	Outline an algorithm to find MaxMin on a given set of elements.	6 Marks	L4	CO2	PO1

UNIT-III

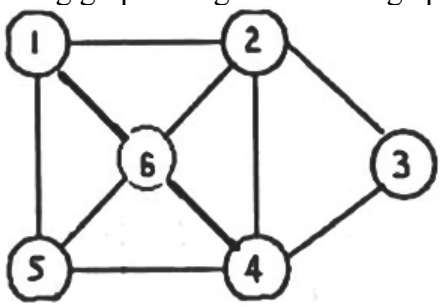
5.	a)	Differentiate characteristics of greedy method and dynamic programming.	6 Marks	L2	CO2	PO1
	b)	Analyze the working of Matrix Chain Multiplication algorithm and compute its complexity.	6 Marks	L3	CO2	PO2
		(OR)				
6.	a)	Compute the cost of shortest path for the following digraph using All Paths algorithm.	6 Marks	L4	CO2	PO2



	b)	Apply 0/1 knapsack method for the case in which n = 3, W_1 =2, W_2 =3; W_3 = 4, p_1 = 1, p_2= 2, p_3= 5, and m = 6, compute the maximum profit.	6 Marks	L4	CO3	PO3

UNIT-IV

7.	a)	Apply algorithm Job sequencing with deadlines and find out optimal solutions for the following problem. Let n = 4, $(p_1, p_2, p_3, p_4) = (100, 10, 15, 27)$, $(d_1, d_2, d_3, d_4) = (2, 1, 2, 1)$	6 Marks	L4	CO3	PO2
	b)	Use algorithm Shortest Paths to obtain in non decreasing order the lengths of the shortest paths from vertex1 to all remaining vertices by taking suitable digraph.	6 Marks	L3	CO2	PO2
		(OR)				
8.	a)	Outline an algorithm to the Job sequencing with deadlines.	6 Marks	L3	CO2	PO2
	b)	Write about Hamiltonian Cycle. Draw the portion of state space tree for the following graph using backtracking approach.	6 Marks	L3	CO2	PO2



UNIT-V

9.	a)	Draw the portion of the state space tree generated by LCBB for the following knapsack instances. n = 5, $(P_1, P_2, P_3, P_4, P_5) = (w_1, w_2, w_3, w_4, w_5) = (4, 4, 5, 8, 9)$ and m = 15.	6 Marks	L3	CO3	PO1
	b)	Present an algorithm schema LCBB for a LC branch and bound search for a least cost answer node.	6 Marks	L2	CO3	PO1
		(OR)				
10.	a)	Explain the classes of NP-hard and NP-complete.	6 Marks	L2	CO4	PO1
	b)	Briefly explain deterministic and nondeterministic algorithms with example.	6 Marks	L2	CO4	PO2

CODE No.: 19BT50101 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

IRRIGATION ENGINEERING AND HYDRAULIC STRUCTURES

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

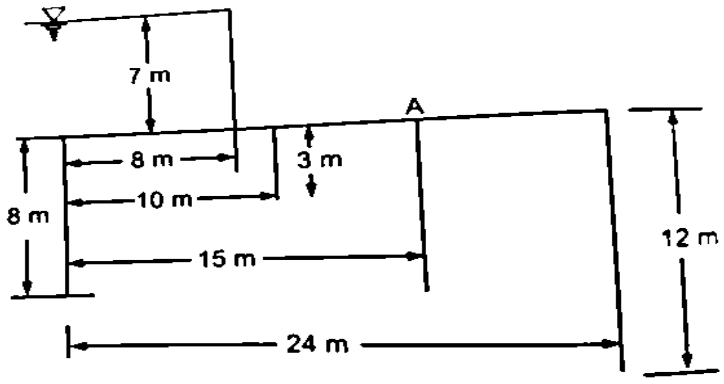
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define irrigation and explain its necessity in a tropical country like India.	6 Marks	L2	CO1	PO1 PO7
	b)	Determine the field capacity of soil for the following data. Depth of root zone = 1.50m Existing moisture = 7% Dry density of soil = 1400 kg/m^3 Quantity of water applied to soil = 600 m^3 Water lost due to deep percolation and Evaporation=8% Plot area =1000m^2	6 Marks	L4	CO1	PO1 PO2 PO6 PO7
		(OR)				
2.	a)	What is the classification of irrigation water having the following characteristics: Concentration of Na, Ca and Mg are 22.2, 3.2 and 1.5 milli-equvalent per litter respectively and the electrical conductivity is 190 micro mhos per cm at 25^0 C.	6 Marks	L4	CO1	PO1 PO2 PO5 PO8
	b)	Explain the terms duty and delta. Derive the relationship between Duty, Delta and Base period.	6 Marks	L4	CO1	PO1 PO2

UNIT-II

3.	a)	Explain the Bligh's creep theory for seepage flow below a weir.	6 Marks	L4	CO2	PO1 PO2 PO4 PO5 PO6 PO7 PO10
	b)	For the section of hydraulic structure given below, Determine i) average hydraulic gradient, ii) residual seepage head at point 'A', iii) Uplift pressure at Point 'A', iv) Bligh's coefficient of creep.	6 Marks	L4	CO2	PO1 PO2 PO4 PO5 PO6 PO7



(OR)

4.	a)	Analyze and explain the functions of silt excluder with a neat sketch.	6 Marks	L4	CO2	PO1 PO2 PO6 PO7 PO10
	b)	Explain the design principles of vertical drop weir.	6 Marks	L2	CO2	PO1 PO6 PO8 PO10

UNIT-III

5.	a)	Derive an expression for elementary profile of a gravity dam.	4 Marks	L4	CO3	PO1 PO2 PO6 PO7 PO10
	b)	Design the practice profile of a gravity dam of stone masonry given the following data: RL of base of dam = 1480 m RL of FRL = 1500.5 m Specific gravity of the masonry = 2.3 Safe compressive stress for masonry = 1200 kN/m² Height of waves = 1.2 m.	8 Marks	L6	CO3	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10

(OR)

6.	a)	Explain the different failures of earth dam.	4 Marks	L2	CO3	PO1 PO6 PO7 PO10
	b)	Design a suitable section for the overflow portion of a concrete gravity dam having the downstream face sloping 0.75 H:1V. The design discharge for the spillway is 8600 cumecs. The height of the spillway crest is kept at RL 205.0 m. the spillway length consists of 6 spans having clear width of 10 m each. Thickness of each pier may be taken as 2.6 m.	8 Marks	L6	CO3	PO1 PO2 PO3 PO4 PO6 PO8 PO10

UNIT-IV

7.	a)	Explain canal regulation works.	4 Marks	L2	CO4	PO1 PO6 PO7 PO8 PO10
	b)	Design a 1.6 m Sarda type fall for a canal having a discharge of 15 cumecs with following data: Bed level upstream = 103.0 m Side slope of channel = 1:1 Bed level downstream = 101.5 m Full supply level = 104.5 Bed level with u/s and d/s soil = 1.0 m Assume Bligh's Coefficient = 6	8 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO10

(OR)

8.	a)	Discuss canal outlets and its classification.	4 Marks	L4	CO4	PO1 PO2 PO6 PO7 PO10
	b)	Using Kennedy's theory, design an irrigation canal for a discharge of5 cumecs, assume N= 0.0225, m= 1.0 and B/D = 3.24. Also find the bedslope of the channel.	8 Marks	L6	CO4	PO1 PO2 PO4 PO5 PO7 PO8 PO10

UNIT-V

9.	a)	Differentiate between aqueduct and super passage with a neat sketch.	4 Marks	L4	CO5	PO1 PO2 PO6 PO7 PO10
	b)	Design a drainage waterway, canal waterway and bed levels at any two sections for a cross drainage work with given the following data: Full supply discharge = 35 cumecs Full supply level = R.L. 215.5 m Canal bed level = R.L. 213.0 m Canal bed width = 21.5 Trapezoidal canal section with $1\frac{1}{2}$H:1V slopes. Canal water depth = 1.5 m Drainage High flood discharge = 300 cumecs High flood level = 210.0 m High flood depth = 2.5 m General ground level = 212.5 m.	8 Marks	L6	CO5	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO10

(OR)

10.	a)	What are the various factors for selection of site for aqueducts?	4 Marks	L4	CO5	PO1 PO2 PO6 PO7
	b)	Design waterways and bed levels at any two sections for a Syphon aqueduct if the following data at the crossing of a canal and a drainage are given: Discharge of canal = 40 cumecs Bed width of canal= 30 Full supply depth of canal = 1.6 m Bed level of canal = 206.4 m Side slope of canal = $1\frac{1}{2}$ H:1V High flood discharge of drainage = 450 cumecs High flood level of drainage = 207.0 m Bed level of drainage = 204.5 m General ground level = 206 .5 m.	8 Marks	L6	CO5	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO10

CODE No.: 19BT50102 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

FOUNDATION ENGINEERING
[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	List the different methods of soil exploration. Explain any one of the methods.	6 Marks	L2	CO1	PO1 PO5 PO10
	b)	The field 'N' value in a deposit of fully submerged fine sand was 50 at a depth of 8 m. The average saturated unit weight of soil is 19 kN/m^3. Calculate the corrected 'N' value.	6 Marks	L4	CO1	PO1 PO2 PO8
		(OR)				
2.	a)	Distinguish between disturbed and undisturbed soil samples. Also give the typical values of area ratio, inside clearance and outside clearance for extracting an undisturbed sample.	6 Marks	L4	CO1	PO1 PO2 PO4 PO10
	b)	Discuss about the planning of subsurface exploration programme. What are the factors affecting the depth of exploration?	6 Marks	L2	CO1	PO1 PO11

UNIT-II

3.	a)	What is lateral earth pressure? Explain the different types of earth pressures with neat sketches.	6 Marks	L2	CO2	PO1 PO10
	b)	A 5.0m high vertical wall supports a cohesive backfill with upper horizontal surface. The properties of backfill are as follows: Upper 3.0 m depth γ_{sat} = 17.6 kN/m^3, c = 7.5kN/m^2 and ϕ = 20^o (ii) Lower 2.0m depth γ_{sat} = 19.2kN/m^3, c = 10kN/m^2 and ϕ = 20^o The free water table stands behind the wall at a depth of 4m from top, neglecting negative pressure up to a depth of tension cracks, determine the total active pressure and its point of application.	6 Marks	L4	CO2	PO1 PO2 PO4 PO6 PO7 PO10
		(OR)				
4.	a)	What are the assumptions of Rankine's earth pressure theory? Derive the Rankine's expression for active and passive earth pressure for a horizontal ground surface condition.	6 Marks	L4	CO2	PO1 PO2 PO5 PO10
	b)	Determine the passive pressure by Rankine's theory per unit run for a retaining wall 4m high, with i=15^0, Φ'=30^0 and γ= 19 kN/m^3. The back face of the wall is smooth and vertical.	6 Marks	L4	CO2	PO1 PO2 PO4 PO10

UNIT-III

5.	a)	Illustrate the different types of earth slope failures with neat sketches.	6 Marks	L2	CO3	PO1 PO6

						PO10
	b)	A 5 m deep canal has side slopes 1:1. The properties of soil are c_u = 20 kPa, $\phi = 10^0$, e = 0.8 and G = 2.80. If Taylor's stability number is 0.108, determine the factor of safety with respect to cohesion, when the canal runs full. Also find the same in case of sudden drawdown, if Taylor's stability number for this condition is 0.137.	6 Marks	L4	CO3	PO1 PO2 PO4 PO6 PO7 PO8 PO10
		(OR)				
6.	a)	Derive an expression for the factor of safety of a purely cohesive soil slope using Swedish slip circle method.	6 Marks	L4	CO3	PO1 PO2 PO10
	b)	Define Taylor's stability number and explain how it is used in the stability analysis of slope under submerged condition.	6 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	State the assumptions made in Terzaghi's bearing capacity analysis. Distinguish between general and local shear failures.	6 Marks	L4	CO4	PO1 PO2 PO10
	b)	A square footing of size 2.5 m is built in a homogeneous bed of dense sand of unit weight 20 kN/m^3 at a depth of 1.5 m below the ground surface. Estimate the safe load that can be carried by footing with a factor of safety of 3 against shear failure. Take N_c=65.4, N_q=49.4 and N_γ=54.0.	6 Marks	L4	CO4	PO1 PO2 PO4 PO6 PO7 PO10
		(OR)				
8.	a)	Explain the plate load test to determine the bearing of soils. What are its limitations?	6 Marks	L2	CO4	PO1 PO10
	b)	Plate load tests were conducted in a cohesive soil using two plates of different sizes and the following results were obtained. Find the size of the square footing to carry a load of 800 kN at a settlement of 25 mm.	6 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO6 PO8 PO10

Load (kN)	Size of plate (m)	Settlement (mm)
40	0.3 x 0.3	25
100	0.6 x 0.6	25

		UNIT-V				
9.	a)	With the help of sketch, explain the load transfer mechanism in a single pile.	6 Marks	L2	CO5	PO1 PO10
	b)	A group of nine piles of 10 m length are arranged in square pattern in sand. Each pile is of 300 mm in diameter with centre to centre spacing of 900 mm. Calculate the ultimate load capacity of the pile group. Take N_q 27, $\emptyset = 30^0$, γ = 19 kN/m^3	6 Marks	L4	CO5	PO1 PO2 PO4 PO8 PO10
		(OR)				
10.	a)	Discuss the process of sinking of well foundation in detail.	6 Marks	L2	CO5	PO1 PO10
	b)	Design a pile group to carry 3000 kN in a soil of uniform clay to depth of 6m underlain by hard rock. The unconfined compressive strength (average) of the clay is 30 kN/m^2. Adopt a factor of safety of 3 against shear failure.	6 Marks	L6	CO5	PO1 PO2 PO3 PO4 PO6 PO8

CODE No.: 19BT50103 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

REINFORCED CEMENT CONCRETE STRUCTURES

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		A reinforced concrete beam is to be designed over an effective span of 5m to support a design service load of 8 kN/m. Adopt M20 grade concrete and Fe 415 HYSD bars and design the beam to satisfy the collapse and serviceability limit states.	12 Marks	L6	CO1	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10
		(OR)				
2.		A tee beam slab floor of an office comprises of a slab 150mm thick spanning between ribs spaced at 3m apart. The effective span of the beam is 8m. Live load on floor is 4 kN/m². Using M20 grade concrete and Fe 415 HYSD bars, design one of the intermediate tee beams.	12 Marks	L6	CO1	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10
		UNIT-II				
3.	a)	An RCC beam 230mm wide and 450mm deep is reinforced with 4 bars of 16mm diameter of grade Fe 415 on tension side. If design shear force is 60 kN. Design the shear reinforcement consisting only of vertical stirrups. The grade of concrete used is M20.	6 Marks	L6	CO2	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10
	b)	A tee beam continuous over 8 m spans has a flange width 900 mm and web width of 300 mm. Effective depth = 400 mm, Area of tension reinforcement = 1600 mm², Area of compression reinforcement = 900 mm². Adopting Fe 415 HYSD bars, estimate the safety of the beam for deflection control using the empirical method.	6 Marks	L4	CO2	PO1 PO2 PO4 PO5 PO6 PO8 PO10
		(OR)				
4.		A rectangular reinforced concrete beam section of size 400 mm overall depth and 200 mm wide is subjected to a twisting moment of 2500 N-m in addition to a transverse shear of 60 kN at the critical section. Calculate the stirrups necessary. Assume M20 grade concrete and Fe 415 steel. The bending moment at a critical section is 25000 N-m. Take effective cover as 40 mm.	12 Marks	L6	CO2	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10

UNIT-III

5.	a)	Explain where and how you provide torsion reinforcement in slabs.	6 Marks	L4	CO3	PO1 PO2
	b)	Design Two way slab for an office floor to suit the following data. Size of office floor is 4 x 6 m, the edge condition is two adjacent edges discontinuous, materials is M20 grade concrete and Fe 415 HYSD bars.	6 Marks	L6	CO3	PO1 PO2 PO3 PO4 PO5 PO6 PO8 P010
		(OR)				
6.		Design a reinforced concrete slab to carry a live load 3 kN/m² on an effective span of 3.5 m. Using M20 grade concrete and Fe 415 steel reinforcement. Sketch the reinforcement details.	12 Marks	L6	CO3	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10

UNIT-IV

7.	a)	How the compression failures occur in RCC columns.	4 Marks	L2	CO4	PO1
	b)	Design the reinforcement in a circular column of diameter 350 mm with helical reinforcement of 8 mm diameter to support a factored load of 1400 kN. The column has an unsupported length of 3.5 m and is braced against side sway. Adopt M20 grade concrete and Fe 415 steel bars.	8 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10
		(OR)				
8.		A short rectangular column having an effective length of 3 m carries a factored axial compressive load of 2000kN. Architectural requirements dictate the column size as 600 x 450 mm. Design the column using M20 concrete and Fe415 steel.	12 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10

UNIT-V

9.	a)	Write down the different types of footings and their suitability. Enumerate the procedure for the design of combined rectangular footing for two columns only.	6 Marks	L4	CO5	PO1 PO2
	b)	A square column of size 400 mm carries a service load of 600 KN. Design an isolated footing for the column by limit state method, if the safe bearing capacity of the soil is 250 KN/m². Use M20 concrete and Fe 415 steel.	6 Marks	L6	CO5	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10

(OR)

10.	A straight stair in residential building is supported on wall on one side and stringer beam on the other side. The risers are 150 mm and treads are 250 mm, and the horizontal span of the stair as 1.2 m. Design the steps use M20 grade concrete.	12 Marks	L6	CO5	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10

CODE No.: 19BT50104 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations June - 2022

TRANSPORTATION ENGINEERING

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What are the required surveys to select the best alignment for given road?	6 Marks	L2	CO1	PO1 PO5 PO6 PO7
	b)	Design the extra widening required for a pavement of width 7m on a horizontal curve of radius 255 m if the longest wheel base of vehicle expected on the road is 7.0 m. Design speed is 75 kmph.	6 Marks	L6	CO2	PO1 PO2 PO3 PO4 PO8
		(OR)				
2.	a)	Write a short note on Jayakar Committee recommendations.	6 Marks	L2	CO1	PO1
	b)	Design overtaking sight distance for a design speed of 90 KMPH. Assume all other required data as per IRC recommendations.	6 Marks	L6	CO2	PO1 PO2 PO3 PO4 PO6 PO7 PO8

UNIT-II

3.	a)	A two lane road at present carrying a traffic of 1500 CVPD. It is to be strengthen for growing traffic needs, VDF=3.75, rate of growth of traffic 7.5% annum, period of construction is 5 years. The pavement is to be designed for a life of 10 years after completion. Calculate the cumulative standard axles used for design.	6 Marks	L4	CO3	PO1 PO2 PO5 PO8
	b)	Write a short note on Los Angeles abrasion test and its significance.	6 Marks	L2	CO1	PO1 PO5 PO8
		(OR)				
4.	a)	Write a short note on ductility test on bitumen and its significance.	6 Marks	L2	CO1	PO1 PO2 PO5 PO8
	b)	Calculate the stress at interior, edge and corner regions of a cement concrete pavement using Westergaard's equation. Use the following data. Wheel load, P=5500kg; Modulus of elasticity of concrete, E=3.0x10^5 kg/cm^2; Pavement thickness, h=15 cm, Poisson's ratio=0.15; Modulus of subgrade reaction=6.0 kg/cm^3; Radius of contact area=12 cm.	6 Marks	L4	CO3	PO1 PO2 PO8

UNIT-III

5.	a)	What is the need of spot speed studies discuss briefly?	6 Marks	L2	CO4	PO1
	b)	Briefly discuss the scope of traffic engineering.	6 Marks	L4	CO4	PO1 PO2
		(OR)				
6.	a)	Write short note road user characteristics.	6 Marks	L2	CO4	PO1
	b)	Briefly discuss the latest developments in traffic volume data collection.	6 Marks	L4	CO4	PO1 PO2 PO5 PO12

UNIT-IV

7.	a)	Discuss briefly about rail joints with neat sketches.	6 Marks	L4	CO5	PO1 PO2 PO10
	b)	A turnout takes off as a 6^0 curve with contrary flexure from a BG main line on a 4^0 curve. The speed on the branch line is restricted to 45 km/hr. Determine the maximum permissible speed on the main line.	6 Marks	L4	CO5	PO1 PO2 PO4
		(OR)				
8.	a)	Briefly discuss the permanent way with a neat sketch.	6 Marks	L2	CO5	PO1 PO10
	b)	Determine the quantity of all the materials required for 5 km track laying for BG.	6 Marks	L4	CO5	PO1 PO2 PO4 PO8

UNIT-V

9.	a)	Write a short note on Airport drainage.	6 Marks	L2	CO6	PO1 PO6 PO7 PO8
	b)	The monthly average of the maximum daily temperature at the proposed site of an airport is 45^0 C during the hottest month of the year. During the same month, the average daily temperature is 33^0 C. Calculate the airport reference temperature. If the site is at MSL and is having an effective gradient of 0.5%. Calculate the actual length to be provided, if basic runway length is 2000 m.	6 Marks	L4	CO6	PO1 PO2 PO4 PO8
		(OR)				
10.	a)	Write a short note on Terminal builidng and its functions.	6 Marks	L2	CO6	PO1 PO8
	b)	The basic length of runway required for take-off and landing are 2000m and 2400m respectively at the proposed site for an airport situated 450m above MSL. The airport reference temperature is 24^0C and the effective gradient along the proposed runway is 0.4%. Calculate the actual length of the runway to be provided.	6 Marks	L4	CO6	PO1 PO2 PO4 PO8

CODE No.: 19BT50105 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

CONSTRUCTION EQUIPMENT AND AUTOMATION

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Describe various criteria for deciding two–shift or three-shift working in a construction project.	6 Marks	L2	CO1	PO1 PO2
	b)	Elucidate safety control measures during construction.	6 Marks	L4	CO1	PO1 PO2 PO7
		(OR)				
2.	a)	Write short notes on: i) Field repairs. ii) Servicing of equipment. iii) Maintenance of engine of heavy earthmoving equipment.	6 Marks	L2	CO1	PO1 PO5 PO6
	b)	A machine was purchased for Rs.45000/- on 1st January, 1985, the erection and installation work costs Rs.7000/-. This was replaced by a new one on 31st December 2005. If the scrap value was estimated fund on 15th June, 1996.	6 Marks	L4	C01	PO1 PO2 PO5 PO10

UNIT-II

3.	a)	Explain the importance of forklifts and mention its types.	6 Marks	L2	CO2	PO1 PO2 PO5
	b)	Discuss different activities an excavator can perform. Also, list the applications of excavator.	6 Marks	L4	CO2	PO1 PO2 PO5
		(OR)				
4.	a)	Discuss the functions of scrapper and List the types of scrapper.	8 Marks	L4	CO2	PO1 PO2 PO5
	b)	Name different portable bins. Write the uses and applications of different portable bins.	4 Marks	L2	CO2	PO1 PO2 PO5

UNIT-III

5.	a)	Discuss in detail about the process of Ready mix concrete manufacturing with a neat sketch.	6 Marks	L2	CO3	PO1 PO5 PO10
	b)	How will you enhance the production capacity of: i) Jaw crushers. ii) Hammer mills. iii) Screening plants. iv) Crushing plants.	6 Marks	L4	CO3	PO1 PO2 PO5 PO6
		(OR)				
6.	a)	Define the process of grouting. Explain the different types of grouting and their applications.	6 Marks	L2	CO3	PO1 PO5
	b)	Suggest two air pollution control equipment used in hot mix asphalt plants and explain about its working.	6 Marks	L4	CO3	PO1 PO2 PO5

UNIT-IV

7.	a)	What is BIM? Explain which professionals and which areas can BIM is useful.	6 Marks	L4	CO4	PO1 PO2 PO5 PO11 PO12
	b)	Explain the stages of project planning.	6 Marks	L2	CO4	PO1 PO5 PO10 PO11
		(OR)				
8.	a)	Explain different dimensions in construction and specify how 5-D is useful in undertsanding the construction process.	6 Marks	L4	CO4	PO1 PO2 PO5 PO10 PO11
	b)	How do engineers are trained in manging these autonomous applications in construction.	6 Marks	L4	CO4	PO1 PO2 PO10 PO11

UNIT-V

9.	a)	Suggest the statement "Robots are very useful in the field of construction".	6 Marks	L4	CO5	PO1 PO2 PO5 PO6 PO11
	b)	"Automation in pre-cast industry" give advantages and disadvantages.	6 Marks	L2	CO5	PO1 PO5 PO11
		(OR)				
10.	a)	Differentiate AGVs and AMVs.	6 Marks	L4	CO5	PO1 PO2 PO5 PO11
	b)	As an engineer would like to prefer robots over mechanical equipment. Why?	6 Marks	L4	CO5	PO1 PO2 PO5 PO6 PO11

CODE No.: 19BT50107 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

ENVIRONMENTAL POLLUTION AND CONTROL

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What is air pollution? Differentiate between primary and secondary air pollutants with examples.	6 Marks	L4	CO1	PO1 PO2 PO6 PO7
	b)	Explain about the different layers of atmosphere with a neat sketch.	6 Marks	L2	CO1	PO1 PO6 PO7 PO10
		(OR)				
2.	a)	Analyze the various impacts of noise pollution on animals and humans.	6 Marks	L4	CO1	PO1 PO2 PO6 PO7
	b)	Discuss about the role of particulate matter in air.	6 Marks	L2	CO1	PO1 PO6 PO7

UNIT-II

3.	a)	Briefly explain self-purification of environment and the associated mechanism.	6 Marks	L2	CO2	PO1 PO6 PO7 PO10
	b)	Briefly explain any one of the case studies in controlling the noise pollution.	6 Marks	L4	CO2	PO1 PO4 PO5 PO6 PO8 PO12
		(OR)				
4.	a)	What are the control options available to reduce of air pollution generated from automobiles?	6 Marks	L2	CO2	PO1 PO6 PO7 PO8
	b)	There are five air conditioners in a room producing 56 dB, 53 dB, 59 dB, 53 dB, 79 dB. Calculate the total sound produced by them.	6 Marks	L4	CO2	PO1 PO2 PO4 PO6 PO7

UNIT-III

5.	a)	Differentiate preliminary and primary treatment of waste water.	6 Marks	L4	CO4	PO1 PO2 PO5 PO6 PO7 PO8 PO10
	b)	What is the need of coagulation process in water treatment? Explain different type coagulants used.	6 Marks	L4	CO3	PO1 PO4 PO5 PO6 PO7 PO10
		(OR)				
6.	a)	Prepare a flow chart of water treatment steps of a water treatment plant. Discuss about disinfection.	6 Marks	L4	CO3	PO1 PO2 PO5 PO6 PO7 PO8 PO10
	b)	What is the purpose of preliminary treatment in wastewater treatment plant?	6 Marks	L2	CO3	PO1 PO5 PO6 PO8 PO10

UNIT-IV

7.	a)	How does surface mining cause soil pollution?	6 Marks	L4	CO4	PO1 PO2 PO4 PO6 PO7
	b)	How polluted soils can impact on human health in urban areas?	6 Marks	L4	CO4	PO1 PO2 PO4 PO6 PO7 PO8 PO10
		(OR)				
8.		How to solve the challenges associated with land pollution?	12 Marks	L4	CO4	PO1 PO2 PO4 PO6 PO7 PO8 PO10

UNIT-V

9. a) Waste composition has been measured for two cities. The results are summarized in Table below: — 6 Marks — L4 — CO5 — PO1 PO2 PO4 PO6 PO7

	City 1	City 2
Wet Weight Generation Rate (kg/person-day)	2.0	1.8
Wet Weight Composition (%)		
Food	15	10
Paper	30	40
Yard	20	15
Other	35	35
Moisture content of fractions (% on wet weight basis)		
Food	80	50
Paper	10	4
Yard	80	30
Other	5	4

i) Which city generates more paper on a dry weight basis?
ii) Find the percent moisture (wet weight basis) for city 1. A nearby disposal site receives all of its MSW (Municipal Solid Waste) from cities 1 and 2. The average moisture content for MSW disposed of at the site is 20 percent.
iii) What fraction of the dry weight refuse comes from city 1?

b) Distinguish open dumping and sanitary land filling. — 6 Marks — L4 — CO5 — PO1 PO2 PO4 PO6 PO7 PO8

(OR)

10. a) What are the wastes to energy options? Discuss any one of the technique in detail. — 6 Marks — L2 — CO5 — PO1 PO5 PO6 PO7 PO8

b) Differentiate primary and secondary air pollutants. — 6 Marks — L4 — CO1 — PO1 PO2 PO6 PO7

CODE No.: 19BT50201 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

CONTROL SYSTEMS

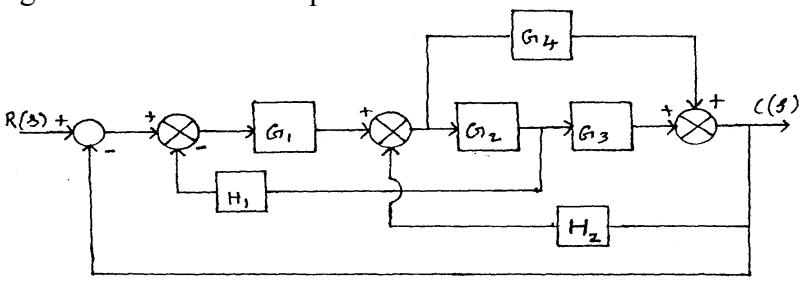
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

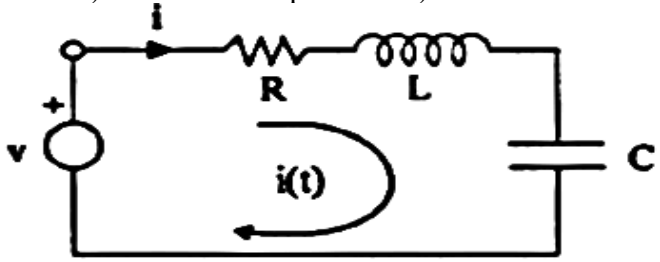
UNIT-I

1.	a)	Derive an expression for the transfer function of an Armature controlled DC motor.	6 Marks	L3	CO1	PO1
	b)	Obtain transfer function for the given system using block diagram reduction techniques.	6 Marks	L3	CO1	PO5



(OR)

2.	a)	Define transfer function and enumerate its advantages and disadvantages.	4 Marks	L2	CO1	PO1
	b)	Obtain the relation between the applied voltage and the current in the form of : i) Differential equation. ii) Transfer function.	8 Marks	L3	CO1	PO2



UNIT-II

3.	a)	Derive the expression for steady state error and obtain its static error constants k_p, k_v and k_a.	6 Marks	L2	CO2	PO1
	b)	For a system whose transfer function is $G(S) = \frac{1}{S(S+1)}$, the input to the system is described by $r(t) = 4 + 6t + 2t^2$. Find the generalized error coefficients and steady state error.	6 Marks	L4	CO2	PO2

(OR)

4.	a)	What is an integral controller and justify how does it improves the dynamics of a control system?	4 Marks	L2	CO2	PO7
	b)	Determine the nature of the closed-loop system for a unit-step input from open loop transfer function of unity feedback system given by $G(S) = \frac{8}{S(S+1)}$. Also determine rise time, peak time and peak overshoot.	8 Marks	L2	CO2	PO2

UNIT-III

5.	a)	Draw the Nyquist plot for the system whose open loop transfer function is $G(S)H(S) = \frac{K}{S(S+2)(S+10)}$. Determine the range of 'K' for which closed loop system is stable.	6 Marks	L2	CO3	PO2
	b)	Determine the range of K for which the system represented by the characteristic equation $S^2 + KS + 2K - 1 = 0$ is stable.	6 Marks	L2	CO3	PO4

(OR)

6.		Sketch the Bode plots showing the magnitude in dB and phase angle in degrees as a function of log frequency for the transfer function $G(S)H(S) = \frac{KS^2}{(1+0.2S)(1+0.02S)}$. Determine the system gain *K* for the gain cross over frequency to be 5 rad/sec.	12 Marks	L2	CO3	PO4

UNIT-IV

7.		A Unity feedback system has an open loop transfer function $G(S) = \frac{K}{S(1+2S)}$. Design a lag compensator so that the phase margin is 40° and the steady state error for ramp input is less than or equal to 0.2.	12 Marks	L4	CO4	PO3

(OR)

8.		Consider the unity feedback system whose open loop transfer function is $G(s)H(s) = \frac{K}{S(S+3)(S+6)}$. Design a suitable compensator to meet the following specifications i) Velocity error constant, K_v= 80 and ii) Phase margin=35^0.	12 Marks	L4	CO4	PO3

UNIT-V

9.		Test the controllability and observability of a system described by $\begin{bmatrix} \dot{X}_1 \\ \dot{X}_2 \\ \dot{X}_3 \end{bmatrix} = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -160 & -56 & -14 \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \\ X_3 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \\ -14 \end{bmatrix} u, \quad y = \begin{bmatrix} 1 & 0 & 0 \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \\ X_3 \end{bmatrix}$	12 Marks	L4	CO5	PO4

(OR)

10.	a)	State the properties of state transition matrix and its significance.	6 Marks	L2	CO5	PO1
	b)	Find the state transitions matrix of the following system. $\dot{X} = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -2 & -5 & -4 \end{bmatrix} X.$	6 Marks	L3	CO5	PO2

❀ ❀ ❀

CODE No.: 19BT50301 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

COMPUTER AIDED DESIGN AND MANUFACTURING

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	What is CAM and write the advantages of CAM?	6 Marks	L2	CO1	PO1 PO2
	b)	Explain the database requirements for CIM.	6 Marks	L2	CO1	PO1 PO2
		(OR)				
2.	a)	Briefly describe various types of storage devices used in computer.	8 Marks	L2	CO1	PO1 PO2
	b)	Write a short note on Computer Integrated Manufacturing (CIM).	4 Marks	L2	CO1	PO1 PO2
		UNIT-II				
3.		Explain 2D and 3D transformations in detail.	12 Marks	L2	CO2	PO1 PO2
		(OR)				
4.	a)	Explicate Geometric transformation. Explain any three common transformations used in computer graphics.	6 Marks	L2	CO2	PO1 PO2
	b)	Differentiate parametric and non-parametric representation of curves.	6 Marks	L2	CO2	PO1 PO2
		UNIT-III				
5.		Discuss on CNC hardware basics.	12 Marks	L2	CO3	PO1 PO5
		(OR)				
6.	a)	Discuss the functions of G codes and explain any five of them in detail.	8 Marks	L2	CO3	PO1 PO5
	b)	What are canned cycles in CNC programming? Explain with an example.	4 Marks	L2	CO3	PO1 PO2
		UNIT-IV				
7.	a)	Write a short note on part family concept.	6 Marks	L2	CO4	PO1 PO5
	b)	Describe production flow analysis in GT concept.	6 Marks	L2	CO4	PO1 PO2
		(OR)				
8.	a)	Contrast contact and non-contact inspection methods.	6 Marks	L3	CO4	PO1 PO2 PO5
	b)	Describe the typical activities involved in CAQC.	6 Marks	L2	CO4	PO1 PO2 PO5

UNIT-V

9.		Define a flow line and classify various types of flow lines.	12 Marks	L1	CO5	PO1 PO2 PO5
		(OR)				
10.	a)	Define Automation. Describe the elements of Automation.	6 Marks	L2	CO5	PO1 PO2 PO5
	b)	Classify Robots by coordinate system with a neat sketch.	6 Marks	L2	CO5	PO1 PO2 PO5

CODE No.: 19BT50302 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

OPERATIONS RESEARCH

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	A company produces two types of leather belts types A and B. Belt A is of a superior quality and belt B is of a lower quality. Profits on the two types of belts are 40 and 30 paise per belt respectively. Each belt of type A requires twice as much time as required by a belt of type B. If all the belts were of type B, the company could produce 1000 belts per day. The supply of leather however is sufficient only for 800 belts per day. Belt A requires a fancy buckle and only 400 fancy buckles are available per day. For belt of type B only 700 buckles are available per day. Formulate LP model and solve the problem.	12 Marks	L3	CO1	PO1 PO2 PO3

(OR)

2.	Solve the following problem by Big-M method. Maximize $Z = 2x_1+5x_2$ Subject to $x_1+4x_2 \geq 24$ $3x_4+x_2 = 21$ $x_1+x_2 \leq 9$ when $x_1 , x_2 \geq 0$	12 Marks	L3	CO1	PO1 PO2 PO3

UNIT-II

3.	A company has received a contract to supply gravel for three new construction projects located in towns A, B and C.	12 Marks	L3	CO1	PO1 PO2 PO3

Project Location	Weekly Requirement (truck loads)
A	72
B	102
C	41

The company has three gravel plants X, Y and Z located in three different towns.

Plant	Amount available/week (truck loads)
X	76
Y	62
Z	77

The company has computed the delivery cost from each plant to each project site. These costs (in rupees) are shown below:

	A	B	C
X	4	8	8
Y	16	24	16
Z	8	16	35

i) Schedule the shipment from each plant to each project location in such a manner so as to minimize the total transportation cost within the constraints imposed by plant capacities and project requirements.

ii) Find the minimum cost.

Is the solution unique? If it is not, find alternative schedule with the same minimum cost.

(OR)

4. A 400m medley relay involves 4 different swimmers, who successively swim 100m of the backstroke, breaststroke, butterfly and freestyle. A coach has six very fast swimmers whose expected times (in seconds) in the individual events are given below: — 12 Marks — L2 — CO1 — PO1

Swimmer	Event 1	2	3	4
1	65	73	63	57
2	67	70	65	58
3	68	72	69	55
4	67	75	70	57
5	71	69	75	57
6	69	71	66	59

How should the coach assign swimmers to the relay?

UNIT-III

5. a) Explain briefly the following: — 4 Marks — L1 — CO2 — PO1

i) Dominance. ii) Mixed strategy.

b) Consider the 5 x 2 game played by players C and D and solve it by graphical method. — 8 Marks — L3 — CO2 — PO1 PO2 PO3

	Player D		
Player C		I	II
	I	1	2
	II	4	5
	III	9	-7
	IV	-3	-4
	V	2	1

(OR)

6. a) A manufacturing company purchases 9000 components for its annual requirement, ordering one month usage at a time. Each component costs Rs 20. The ordering cost per order is Rs 15 and the carrying charges are 15 % of the average inventory per year. You have been assigned to suggest a more economical purchasing policy for the company. What advice would you offer and how much would it save the company per year? — 5 Marks — L2 — CO3 — PO1

b) A manufacturing company needs 2500 units of a particular component every year. The company buys it at the rate of Rs 30 per unit. The order processing cost for this component is estimated at Rs 15 and the cost of carrying a component in stock comes to about Rs 4/ year. The company can manufacture this component internally. In that case it saves 20% of the price of the product. However, it estimates a setup cost of Rs 250 per production run. The annual production rate would be 4800 units. The inventory holding cost remains unchanged. Determine EOQ and the optimal Number of orders placed in a year. Determine the optimum production lot size. Should the company manufacture the component internally or continue to purchase it from the supplier? — 7 Marks — L3 — CO3 — PO1 PO2

UNIT-IV

7. The following table gives the activities and other relevant data for a project. — 12 Marks — L3 — CO4 — PO1 PO2 PO3

Activity	Immediate predecessor (s)	Normal time (days)	Crash time (days)	Normal cost (Rs.)	Crash cost (Rs.)
A	__	4	3	60	90
B	__	6	4	150	250
C	__	2	1	38	60
D	A	5	3	150	250
E	C	2	2	100	100
F	A	7	5	115	175
G	B, D, E	4	2	100	240

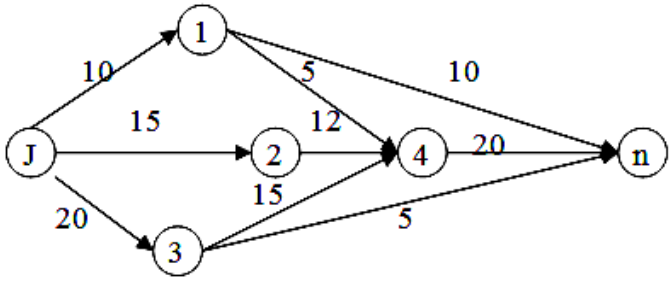
Indirect cost varies as follows:

Days	15	14	13	12	11	10	9	8	7	6
Cost(Rs.)	600	500	400	250	175	100	75	50	35	25

i) Draw the network diagram.
ii) Find the normal project duration and the associated total cost.
iii) Find the optimal project duration and the associates total cost.

(OR)

8. Find the maximum flow for the following network from source to sink. — 12 Marks — L3 — CO4 — PO1 PO2 PO3



UNIT-V

9. a) The arrival rate of customers at the single window booking counter of a two wheeler agency follows poission distribution and and the service time follows exponential distribution and hence, the service rate also follows poission distribution. The arrival rate and the service rate are 25 customers per hour and 35 customers per hour respectively. Find the following: — 5 Marks — L3 — CO5 — PO1 PO2 PO3
   i) Utilization of the booking clerk.
   ii) Average number of waiting customers in the queue.
   iii) Average number of waiting customers in the system.
   iv) Average waiting time per customer in the queue.
   v) Average waiting time per customer in the system.

   b) An oil company is constructing a service station on a high way. Traffic analysis indicated that customers' arrivals over most of the day would approximate a poisson distribution with a mean of 40 automobiles per hour, with that service time distribution approximating the negative exponential. If 5 pumps are installed; — 7 Marks — L3 — CO5 — PO1 PO2 PO3

i) What is the probability that an arrival would have to wait in line?
ii) Find out the average waiting time, average time spent in the system and the average number of automobiles in the system.

(OR)

10. A dentist schedules all her patients for 30 minutes appointments. Some of the patients take more or less than 30 minutes depending on the type of dental work to be done. The following summary shows the various categories of work, their probabilities and time needed to complete the work. — 12 Marks — L4 — CO5 — PO1, PO2, PO3

Category	Time required (Minutes)	Probability of category
Filling	45	0.4
Crown	60	0.15
Cleaning	15	0.15
Extraction	45	0.1
Checkup	15	0.2

Simulate the dentist's clinic for four hours and determine the average waiting time for the patients as well as the idleness of the doctor. Assume that all the patients show up at the clinic at exactly their scheduled arrival times, starting at 8 A.M. Use the following random numbers for handling the above problem: 40, 82, 11, 34, 25, 66, 17, 79.

CODE No.: 19BT50303 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

THERMAL ENGINEERING-II
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Define boiler. Briefly explain boiler accessories.	6 Marks	L2	CO1	PO1
	b)	Illustrate with a neat sketch working of lamont boiler.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Discuss boiler efficiency and heat balance sheet.	6 Marks	L2	CO1	PO1
	b)	The following observations were made in a boiler trail. Coal used = 250 kg of calorific value = 29800 KJ/kg, Water evaporated = 2000 kg, Steam pressure = 11.5 bar, dryness fraction of steam = 0.95 and feed water temperature = 34ºC. Calculate: i. Equivalent of evaporation ii. Boiler efficiency	6 Marks	L3	CO1	PO1 PO2
		UNIT-II				
3.	a)	Derive an expression for discharge of steam flow through nozzle.	6 Marks	L2	CO2	PO1
	b)	Dry saturated steam at a pressure of 8 bar with negligible velocity expands isentropically in a convergent nozzle to 2 bar and dryness fraction 0.89. Determine the velocity of steam leaving the nozzle.	6 Marks	L3	CO2	PO1 PO2
		(OR)				
4.	a)	Compare the merits and demerits of surface condenser over jet condenser.	6 Marks	L2	CO2	PO1
	b)	Vacuum efficiency of condenser is 96%. The temperature of condensate is 40ºC. If the barometer reads 752 mm of hg, find the vacuum gauge reading of the condenser.	6 Marks	L2	CO2	PO1 PO2
		UNIT-III				
5.	a)	Differentiate between impulse and reaction turbines.	6 Marks	L1	CO3	PO1
	b)	The steam supply to an impulse turbine with a single row of moving blades is 2 kg/sec. The turbine develops 130KW, the blade velocity being 175 m/s. The steam flows from the nozzle with a velocity of 400 m/s and the velocity coefficient of blades is 0.9. Find the nozzle angle, blade angle at entry and exit, if the steam flows axially after passing over the blades.	6 Marks	L3	CO3	PO1 PO2 PO3 PO4
		(OR)				
6.	a)	What is degree of reaction? Explain with h-s diagram.	6 Marks	L3	CO3	PO1
	b)	A parson's reaction turbine, while running at 400 r.p.m consumes 30 tons of steam per hour. The steam at a certain stage is at 1.6 bar with dryness fraction of 0.9 and the stage develops 10KW. The axial velocity of flow is constant and equal to 0.75 of the blade velocities. Find mean diameter of the drum and volume of the steam flowing per second. The balde tip angles at inlet and exit as 35º and 20º respectively.	6 Marks	L3	CO3	PO1 PO2 PO3 PO4

UNIT-IV

7.	a)	List the desirable properties of refrigerants.	6 Marks	L3	CO4	PO1 PO2
	b)	In a refrigeration plant works on bell Coleman cycle. Air is compressed to 5 bars from 1 bar. Its initial temperature is 10º C after compression the air is cooled up to 20º C in a cooler before expanding back to a pressure of 1 bar. Determine the theoretical COP of the plant and net refrigerating effect. Take Cp = 1.005 KJ/kg K and Cv = 0.718 KJ/kg K.	6 Marks	L3	CO4	PO1 PO2 PO3
		(OR)				
8.	a)	Discuss the advantages of vapour absorption refrigeration system over vapour compression refrigeration system.	6 Marks	L3	CO4	PO1 PO2
	b)	Differentiate between heat engine, refrigerator and heat pump with neat sketch.	6 Marks	L3	CO4	PO1 PO2 PO3

UNIT-V

9.	a)	With the help of psychrometric charts, explain the following process: i) Heating and humidification process. ii) Cooling and de humidification.	6 Marks	L3	CO5	PO1
	b)	Atmospheric air with dry bulb temperature of 28ºC and a wet bulb temperature of 17ºC is cooled to 15ºC without changing its moisture content. Find i) Original relative humidity. ii) Final relative humidity. iii) Final wet bulb temperature.	6 Marks	L3	CO5	PO1 PO2 PO3
		(OR)				
10.	a)	Define the following terms: i) Specific humidity. ii) Absolute humidity. iii) Relative humidity.	6 Marks	L3	CO5	PO1 PO2
	b)	Draw a neat diagram of air conditioning system required for winter season. Explain the working of different components in the circuit.	6 Marks	L3	CO5	PO1 PO2 PO3 PO4

CODE No.: 19BT50304 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

AUTOMOBILE ENGINEERING
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	List the types of drive mechanism in automobiles and explain any one with a neat sketch.	6 Marks	L1	CO1	PO1 PO2
	b)	Compare turbo charging and supercharging.	6 Marks	L2	CO1	PO1
		(OR)				
2.		Explain the working of solex carburetor with a neat sketch.	12 Marks	L2	CO1	PO1
		UNIT-II				
3.		Discuss the working principle of high pressure cooling system used in automobiles.	12 Marks	L2	CO2	PO1 PO2
		(OR)				
4.	a)	Differentiate between battery ignition and magneto ignition system.	6 Marks	L2	CO2	PO1
	b)	What are the merits and demerits of electronic ignition system?	6 Marks	L2	CO2	PO1
		UNIT-III				
5.		Illustrate with a neat sketch working principle of a solenoid switch and current voltage regulator used in an automobile.	12 Marks	L2	CO3	PO1
		(OR)				
6.		Explain the importance of traction control system (TCS) and active suspension system (ASS) in an automobile.	12 Marks	L2	CO3	PO1
		UNIT-IV				
7.		Classify the types of gearbox used in automobile. Explain any two with a neat sketch.	12 Marks	L2	CO4	PO1 PO2
		(OR)				
8.		Explain the following: i) Camber. ii) Caster. iii) Toe-in. iv) Toe-out. v) Steering ratio. vi) Over steering.	12 Marks	L1	CO4	PO1
		UNIT-V				
9.		What is the significance of damping system? Explain the working of suspension systems used in an automobile.	12 Marks	L2	CO5	PO1 PO2
		(OR)				
10.		With neat diagram describe the working principle of a mechanical braking system and pneumatic braking system.	12 Marks	L2	CO5	PO1 PO2

CODE No.: 19BT50402 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

DIGITAL SIGNAL PROCESSING

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Check the stability of the LTI systems , whose impulse responses are. i) $h(n) = 4^n u(-n)$. ii) $h(n) = 0.3^n u(n) + 2^n u(n)$.	6 Marks	L2	CO1	PO2
	b)	Test the causality of the following system. i) $y(n) = x(n) + 2x(n+3)$. ii) $y(n) = x(n^2)$.	6 Marks	L2	CO1	PO2
		(OR)				
2.		Evaluate the transfer function of the system $y(n) = 0.7y(n-1) - 0.12y(n-2) + x(n-1) + x(n-2)$ using Z transform. Assume the system is initially at rest.	12 Marks	L3	CO1	PO4

UNIT-II

3.	a)	State and prove any two properties of DFT.	6 Marks	L2	CO2	PO1
	b)	Construct the general flow graph for 8 point DIFFFT algorithm and analyze its computational complexity.	6 Marks	L2	CO2	PO2
		(OR)				
4.		Apply decimation in time algorithm and compute the DFT of the following sequence: x(n)={2, 1, 2, 1, 1, 2, 1, 2 }.	12 Marks	L3	CO2	PO5

UNIT-III

5.	a)	Apply impulse invariant transformation method and Convert the analog filter into a digital filter whose system function is $H(S) = \frac{S + 0.4}{(S + 0.4)^2 + 16}$. Assume T=0.1sec.	8 Marks	L3	CO3	PO5
	b)	Express the relationship between digital and analog frequency in bilinear and impulse invariant method.	4 Marks	L2	CO3	PO1
		(OR)				
6.		Design a digital Butterworth filter satisfying the constraints. $0.707 \le \left\| H\left(e^{j\omega}\right) \right\| \le 1 \quad 0 \le \omega \le \frac{\pi}{2}$ $\left\| H\left(e^{j\omega}\right) \right\| \le 0.2 \quad \frac{3\pi}{4} \le \omega \le \pi$ with T=1sec using bilinear transformation.	12 Marks	L4	CO3	PO3

UNIT-IV

7.	a)	Evaluate the frequency response of FIR filter defined by $y(n) = 0.25x(n) + x(n-1) + 0.25\ x(n-2)$. Calculate the phase delay and group delay.	7 Marks	L4	CO3	PO2
	b)	Realize the FIR filter having transfer function $H(z)=\mathbf{z^5+2z^4+0.5z^3+0.5z^2+2z+1}$.	5 Marks	L3	CO3	PO5
		(OR)				
8.		Design a linear phase FIR highpass filter using hamming window with cut off frequency $Wc=0.8\pi$ rad/sample and N=7.	12 Marks	L4	CO3	PO3

UNIT-V

9.	a)	What are the functional units in the architecture of TMS320C6X processor and explain their operations.	8 Marks	L2	CO4	PO1
	b)	Write short notes on Control Register file.	4 Marks	L2	CO4	PO1
		(OR)				
10.		Discuss different addressing modes used in programmable Digital signal processor.	12 Marks	L2	CO4	PO1

CODE No.: 19BT50407 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

RADAR ENGINEERING

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	With neat diagram of normalized radar cross section of sphere as a function of its circumference. Explain Rayleigh, Mie and optical region.	6 Marks	L2	CO1	PO2
	b)	With appropriate diagrams explain the process of envelope detection.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Identify and build the relation between range and minimum detectable signal for RADAR.	6 Marks	L2	CO1	PO2
	b)	With the basic principles of RADAR discuss the various parameters which improve the performance of the RADAR.	6 Marks	L4	CO1	PO4
		UNIT-II				
3.	a)	Explain how isolation between transmitter and receiver is obtained in CW RADAR.	6 Marks	L2	CO1	PO1
	b)	Construct a block diagram to evaluate the working of MTI RADAR with power amplifier transmitter.	6 Marks	L2	CO1	PO1
		(OR)				
4.	a)	What is the use of delay line canceller? Obtain the frequency response of a single and double delay line canceller.	6 Marks	L3	CO1	PO5
	b)	Demonstrate MTI RADAR using range gates and filters using block diagram and discuss its frequency response characteristics.	6 Marks	L3	CO1	PO5
		UNIT-III				
5.	a)	What do you mean by term tracking radar? Explain the working of monopulse radar with the help of block diagram.	6 Marks	L3	CO2	PO5
	b)	With a neat diagram explain the operation of a conical scan Radar. Explain the various factors that need to be considered for optimum squint angle.	6 Marks	L2	CO2	PO1
		(OR)				
6.	a)	Distinguish scanning and tracking. Explain any one method of tracking in detail.	6 Marks	L2	CO2	PO5
	b)	Why is the acquisition needed? What are the various search patterns available explain them with neat sketches.	6 Marks	L3	CO2	PO5
		UNIT-IV				
7.	a)	Elaborate the various displays available and specify their characteristics.	6 Marks	L2	CO3	PO1
	b)	What is the role of duplexers in radar system? Illustrate transmit and receive condition in case of balanced duplexer.	6 Marks	L2	CO3	PO1
		(OR)				
8.	a)	Infer how beam width of a phase array antenna will vary with steering angle.	6 Marks	L2	CO3	PO2
	b)	Illustrate how Neyman-Pearson observer criteria are used for detection of RADAR signals.	6 Marks	L2	CO4	PO5

UNIT-V

9.	a)	Write a short note on Instrument landing system.	6 Marks	L1	CO5	PO2
	b)	Demonstrate the salient features of VHF Omnidirectional Range (VOR) navigation system used for detecting the position of aircrafts.	6 Marks	L2	CO5	PO6
		(OR)				
10.	a)	Elaborate how range and accuracy can be calculated for an ILS navigator system for any application.	6 Marks	L2	CO5	PO6
	b)	Explain the localizer and glide path systems of ILS.	6 Marks	L2	CO5	PO6

CODE No.: 19BT50441 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

MICROPROCESSORS AND INTERFACING

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the Register organization of 8086.	5 Marks	L1	CO1	PO1
	b)	Sketch the pin diagram of 8086 and explain each and every pin.	7 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Illustrate the timing diagram for the minimum mode of read cycle of 8086.	6 Marks	L2	CO1	PO2
	b)	Write an ALP to find largest byte in given set of n bytes.	6 Marks	L4	CO1	PO4
		UNIT-II				
3.	a)	Explain in detail about PUSH and POP Instructions in 8086.	6 Marks	L1	CO2	PO1
	b)	Elaborate Interrupt Service Routine.	6 Marks	L2	CO2	PO2
		(OR)				
4.	a)	Define the following with an example. i) Byte, ii)Word, iii)Quad word	6 Marks	L1	CO2	PO1
	b)	Write an ALP to count number of bit '1's in a given word '56FA'H.	6 Marks	L4	CO2	PO4
		UNIT-III				
5.	a)	Define Interfacing and mention the purpose of interfacing.	6 Marks	L2	CO3	PO1
	b)	Develop an ALP to generate a 100 KHz saw tooth signal.	6 Marks	L3	CO3	PO3
		(OR)				
6.	a)	Explain how a stepper motor is different from a conventional motor for few 8086 based applications.	6 Marks	L2	CO3	PO2
	b)	Develop an Assembly language program in 8086 to rotate a stepper motor by 180º in anti clockwise direction followed by another 180º in clockwise direction.	6 Marks	L4	CO3	PO6
		UNIT-IV				
7.	a)	Write in detail about the operating modes of 8259.	6 Marks	L1	CO3	PO1
	b)	Explain the Pin architecture of 8257.	6 Marks	L1	CO3	PO1
		(OR)				
8.	a)	Explain the internal architecture of 8257 DMA controller.	6 Marks	L1	CO3	PO1
	b)	Analyze an Interrupt request response of an 8086 system.	6 Marks	L2	CO3	PO2
		UNIT-V				
9.	a)	Explain any two applications of microcontrollers.	4 Marks	L1	CO4	PO1
	b)	Analyze the operational features of 8051 microcontroller.	8 Marks	L2	CO4	PO2
		(OR)				
10.	a)	Write an ALP for 8051 microcontrollers to rotate stepper motor by 90º.	6 Marks	L3	CO4	PO5
	b)	Write an ALP to add and multiply unsigned bytes.	6 Marks	L4	CO4	PO4

❀ ❀ ❀

CODE No.: 19BT50442 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

PRINCIPLES OF COMMUNICATIONS

[Electrical and Electronics Engineering,
Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain how the signal of an SSB-SC is reconstructed at the receiver using block diagram.	6 Marks	L2	CO1	PO2
	b)	What does modulation actually do to a message and carrier?	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Define frequency modulation. Derive the expression for single tone FM wave and specify the bandwidth requirements.	8 Marks	L1	CO1	PO1
	b)	Give the relationship between phase and Frequency modulation and explain.	4 Marks	L2	CO1	PO2
		UNIT-II				
3.		Explain TDM and FDM with the help of block diagram and give their advantages and disadvantages.	12 Marks	L2	CO2	PO1
		(OR)				
4.	a)	What are the advantages of digital communication systems over analog communication systems?	4 Marks	L1	CO2	PO2
	b)	With neat block diagram and waveforms, explain the generations of PAM, PWM and PPM.	8 Marks	L1	CO2	PO2
		UNIT-III				
5.	a)	Explain the terms: i) Quantization error ii) Slopeover distortion iii) Effects of Quantization	6 Marks	L2	CO3	PO2
	b)	Explain adaptive delta modulation with neat block diagram and brief its advantages over delta modulation.	6 Marks	L2	CO3	PO1
		(OR)				
6.		Explain each block of a PCM system and elaborate the advantages when compared to pulse modulation techniques.	12 Marks	L4	CO3	PO2
		UNIT-IV				
7.	a)	Differentiate BFSK, BASK and BPSK with relevant waveforms.	6 Marks	L3	CO4	PO1
	b)	Briefly explain about the coherent and non-coherent techniques of a pass band digital transmission.	6 Marks	L4	CO4	PO2
		(OR)				
8.		Sketch the waveforms for the bit pattern 1100010101 using DPSK and QPSK.	12 Marks	L4	CO4	PO2

UNIT-V

9.	a)	Explain Huffman coding for ½, 1/8, 1/8, 1/16, 1/16, 1/16, 1/32 and 1/32.	6 Marks	L3	CO5	PO1
	b)	An event has six possible outcomes with the probabilities 0.5, 0.25, 0.125, 0.15, 0.25, 0.125. Find the entropy of the system. Also find rate of information if there are 16 outcomes per second.	6 Marks	L3	CO5	PO3
		(OR)				
10.	a)	Derive the coding efficiency in Shannon-Fano method.	7 Marks	L3	CO5	PO4
	b)	Design an encoder for a generator polynomial with (6, 3) block code.	5 Marks	L4	CO5	PO3

CODE No.: 19BT50502 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations June - 2022

ARTIFICIAL INTELLIGENCE

[Computer Science and Engineering, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the disciplines that contribute ideas and techniques to artificial intelligence.	6 Marks	L2	CO1	PO1
	b)	Discuss the advantages of artificial intelligence.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Define rational agent? Describe the properties of task environment.	6 Marks	L1	CO1	PO1
	b)	Construct schematic diagrams for simple-reflex agent and model-based reflex agents.	6 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Explain the four-phase problem-solving process followed by agents.	6 Marks	L1	CO2	PO1
	b)	Discuss the importance of using problem-solving agents to solve real-world problems.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Describe informed search strategies with examples.	6 Marks	L2	CO2	PO2
	b)	Analyze the process of generating heuristics from sub-problems with suitable example.	6 Marks	L4	CO2	PO2

UNIT-III

5.	a)	Explain simulated annealing algorithm.	6 Marks	L2	CO2	PO1
	b)	Examine the importance of using alpha-beta pruning to make optimal decision in multiplayer games.	6 Marks	L2	CO2	PO3
		(OR)				
6.	a)	Illustrate Hill-climbing search mechanism using 8-queens problem.	6 Marks	L2	CO2	PO1
	b)	Discuss the importance of using move ordering in game with relevant example.	6 Marks	L2	CO2	PO2

UNIT-IV

7.	a)	Elaborate the process of constructing Bayesian networks with suitable example.	6 Marks	L2	CO3	PO1
	b)	Examine the importance of using transition and sensor models to handle dynamic situations.	6 Marks	L4	CO3	PO3
		(OR)				
8.	a)	Explain the Simplified matrix algorithms used in Hidden Markov Model.	6 Marks	L2	CO3	PO2
	b)	Discuss the applications of kalman filter.	6 Marks	L1	CO3	PO1

UNIT-V

9.	a)	Elaborate on the types of robots from the hardware perspective.	6 Marks	L2	CO4	PO1
	b)	Discuss the negative aspects of artificial intelligence and its impact on society.	6 Marks	L2	CO5	PO8
		(OR)				

10.	a)	Analyze localization and mapping using a simplified kinematic and sensor model for robots.	6 Marks	L2	CO4	PO1
	b)	Outline the Trust and Transparency mechanism in artificial intelligence.	6 Marks	L2	CO5	PO6

CODE No.: 19BT51042 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

SENSORS AND SIGNAL CONDITIONING

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Differentiate primary and secondary transducers.	6 Marks	L2	CO1	PO2
	b)	Describe the materials used for RTD's, along with their properties. Sketch their typical characteristics.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Explain the construction of wire wound strain gauges and derive the expression for the gauge factor.	6 Marks	L2	CO1	PO2
	b)	What are thermistors? Explain their different forms of construction.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Derive the expressions for voltages in the three phases of a synchro-transmitter.	6 Marks	L2	CO1	PO2
	b)	Derive the relationship between linear displacement and change in overlapping area of parallel plates of capacitor and prove that sensitivity of the sensor is constant.	6 Marks	L2	CO1	PO6
		(OR)				
4.	a)	Explain principle and working of eddy current sensor with neat sketch.	6 Marks	L2	CO1	PO1
	b)	Elaborate the measurement of linear displacement with a reluctance sensor with neat sketch.	6 Marks	L2	CO1	PO6
		UNIT-III				
5.	a)	Describe the properties of materials used for piezo-electric transducers. Derive expressions for voltage and charge sensitivities.	6 Marks	L2	CO2	PO2
	b)	Select a suitable sensor used for measurement of temperature range of 1200ºC to 3500ºC and explain its working.	6 Marks	L2	CO2	PO2
		(OR)				
6.	a)	Explain the principle of working and constructional details of a photo-voltaic cell. Explain why it is useful for space applications.	6 Marks	L3	CO2	PO3
	b)	Distinguish infrared and radiation pyrometers with respect to construction and working principles.	6 Marks	L2	CO2	PO2
		UNIT-IV				
7.	a)	Select an appropriate non contact sensor to measure liquid level. Justify your sensor selection and explain its principle using a neat sketch.	6 Marks	L2	CO3	PO5
	b)	Describe how fiber optic transducers are used for measurement of liquid level.	6 Marks	L2	CO3	PO2

(OR)

8.	a)	Select a suitable transducer for measurement of speed and explain its operation.	6 Marks	L2	CO3	PO5
	b)	Demonstrate how smart sensors are used for measurement of physical parameters using suitable example.	6 Marks	L2	CO3	PO6

UNIT-V

9.	a)	Derive the expressions for bridge sensitivity factor for Blumlein bridge having inductors in push pull configuration.	6 Marks	L3	CO4	PO2
	b)	Describe the functioning of a carrier amplifier using an operational amplifier. Sketch the relevant waveforms.	6 Marks	L2	CO4	PO1

(OR)

10.	a)	Write short notes on A.C bridges using Push-pull transducers.	6 Marks	L2	CO4	PO2
	b)	Derive the expressions for output voltage of a instrumentation amplifier in terms of the two input voltages.	6 Marks	L3	CO4	PO2

CODE No.: 19BT51202 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations June - 2022

WEB TECHNOLOGIES

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		Design a web page which provides the following details: i) Train Name ii) Starting Place iii) Destination iv) Arrival and Departure time v) Fare Place a border for the table and use cell padding to present the cell data with clarity. Align the table in the center of the screen. Use a caption saying 'Time and Fare List'.	12 Marks	L2	CO1	PO3
		(OR)				
2.		Design a web page with fields user id, password and a submit button. Consider the following while writing a HTML code. i) Table to include fields. ii) Background image with repeatable option. iii) Font Styles and Sizes.	12 Marks	L2	CO1	PO3
		UNIT-II				
3.	a)	Classify different types of CSS. List the advantages of external CSS.	6 Marks	L1	CO2	PO1
	b)	Develop a web page to perform hiding and showing of HTML elements using JQuery.	6 Marks	L3	CO2	PO4
		(OR)				
4.	a)	Compare and Contrast AJAX Web Application Model and Classical Web Application Model.	6 Marks	L2	CO2	PO2
	b)	Design a webpage with animation effects using JQuery methods.	6 Marks	L3	CO2	PO4
		UNIT-III				
5.		Create contact us page using bootstrap responsive classes.	12 Marks	L3	CO3	PO5
		(OR)				
6.		Create a grid system for mobile, tablet and desktop with bootstrap.	12 Marks	L3	CO3	PO5
		UNIT-IV				
7.	a)	Define Associative array. Write a code to implement associative array.	6 Marks	L1	CO4	PO1
	b)	Explain the following concepts of PHP arrays: i) Merging ii) Slicing iii) Splicing	6 Marks	L2	CO4	PO1
		(OR)				
8.	a)	Classify data types of PHP.	6 Marks	L1	CO4	PO1
	b)	Define Type casting. List cast operators of PHP with syntax.	6 Marks	L1	CO4	PO1

UNIT-V

9.	Develop a PHP code to perform the following with MySQL database: i) Connection Establishment. ii) Query generation for table creation. iii) Retrieving the data from the select query.	12 Marks	L3	CO5	PO6
	(OR)				
10.	Develop a PHP code for the following: i) Fetching database results into an object. ii) Retrieving database results using indexed and associative arrays.	12 Marks	L3	CO6	PO6

CODE No.: 19BT51205 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

MOBILE COMPUTING

[Information Technology]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Show with a diagram the steps involved in a mobile terminated call (a station calling and a mobile station) in GSM	6 Marks	L3	CO1	PO2
	b)	Explain about GPRS system in detail.	6 Marks	L2	CO1	PO1
		(OR)				
2.		Give reasons for a handover in GSM and the problems associated with it. Discuss the typical steps for handover are and what types of handover can occur?	12 Marks	L1	CO1	PO2
		UNIT-II				
3.	a)	"TDMA is much more flexible than FDMA"-Justify this statement with various TDMA algorithms.	6 Marks	L4	CO2	PO5
	b)	Explain about CDMA.	6 Marks	L1	CO2	PO1
		(OR)				
4.	a)	Compare and Contrast LTE Advanced and WiMax 16M.	6 Marks	L4	CO2	PO5
	b)	Write a short notes on WCDMA 3G.	6 Marks	L1	CO2	PO1
		UNIT-III				
5.	a)	Explain mechanism for IP packet delivery using mobile IP concept.	6 Marks	L2	CO2	PO1
	b)	Explain the format of Agent Advertisement Packet.	6 Marks	L1	CO3	PO1
		(OR)				
6.	a)	Explain in detail about IP-in-IP encapsulation.	6 Marks	L2	CO3	PO1
	b)	Define care of address (CoA) and what are the two different possibilities for the location of CoA?	6 Marks	L1	CO3	PO1
		UNIT-IV				
7.	a)	Describe slow start of congestion control. How can fast recovery take place in the congestion avoidance phase?	6 Marks	L2	CO3	PO2
	b)	Discuss the working principle, advantage and disadvantages of Indirect TCP in detail.	6 Marks	L1	CO3	PO1
		(OR)				
8.	a)	Describe briefly on congestion control in traditional TCP.	6 Marks	L1	CO3	PO1
	b)	Write about selective retransmission policy in mobile TCP.	6 Marks	L2	CO3	PO1
		UNIT-V				
9.	a)	Explain the session establishment in WSP/B.	6 Marks	L1	CO4	PO1
	b)	Compare and Contrast ZigBee and Wi-Fi.	6 Marks	L4	CO4	PO2
		(OR)				
10.	a)	Discuss MAC layer Bluetooth system.	6 Marks	L2	CO4	PO1
	b)	Write short notes on Wireless LANs.	6 Marks	L1	CO4	PO1

CODE No.: 19BT60314 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

OPTIMIZATION TECHNIQUES

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What is a saddle point? Find the dimensions of a cylindrical tin (with top and bottom) made up of sheet metal to maximize its volume such that the total surface area is equal to $A_0 = 36\pi$.	6 Marks	L3	CO1	PO1 PO2
	b)	Classify the optimization technique methods and provide suitable example for each case.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Use Kuhn-Tucker conditions to solve the following non-linear programming problem. Maximize $Z = 3.6x_1-0.4x_1^2+1.6x_2-0.2x_2^2$ Subject to the constraints $2x_1+x_2 \le 10$ $x_1, x_2 \ge 0$	8 Marks	L3	CO1	PO1 PO2
	b)	How would you formulate an Optimization problem in general statement? Also provide insights of ; i) Design Constraints. ii) Constraint Surface. iii) Objective Function. iv) Design Vector.	4 Marks	L2	CO1	PO1 PO2

UNIT-II

3.	a)	Solve the following LPP using Simplex method. *Maximize* $Z = 10x_1 + 4x_2 + x_3$ *subject to* $2x_1 + x_2 \le 1$ $x_1 + 4x_2 \le 6$ $x_3 \le 6$ $x_1, x_2, x_3 \ge 0$	8 Marks	L3	CO2	PO1 PO2
	b)	Define: i) Surplus variable, ii) Slack variable	4 Marks	L2	CO2	PO1
		(OR)				
4.		Solve the following LPP by using Dual Simplex Method Minimize $Z = 2x_1 + 3x_2$ Subjected to $2x_1+2x_2 \le 30$ $x_1+2x_2 \ge 10$ $x_1, x_2 \ge 0$	12 Marks	L3	CO2	PO1 PO2

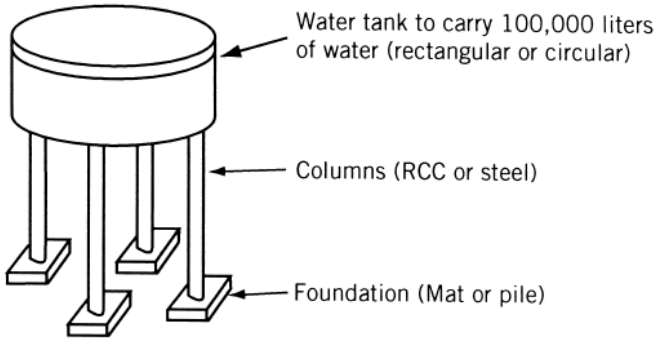
UNIT-III

5.		Perform four iterations of Powell's method to minimize the function $f = 4x_1^2+3x_2-5x_1x_2-8x_1$ from the starting point (0, 0).	12 Marks	L3	CO3	PO1 PO2

(OR)

6.		Minimize $f(x_1,x_2)=\frac{1}{3}(x_1+1)^3+x_2$ Subject to $g_1(x_1, x_2) = 1 - x_1 \leq 0$ $g_2(x_1, x_2) = -x_2 \leq 0$ using exterior penalty function method.	12 Marks	L3	CO3	PO1 PO2

UNIT-IV

7.	a)	Explain the concept of sub-optimization in the context of the design of the water tank shown below.  	6 Marks	L2	CO4	PO1 PO2 PO3
	b)	Explain the computational procedure in Dynamic programming.	6 Marks	L2	CO4	PO1

(OR)

8.		Use dynamic programming approach to minimize; $f = 50x_1 + 100x_2$ Subject to $10x_1 + 5x_2 \leq 2500$ $4x_1 + 10x_2 \leq 2000$ $x_1 + 1.5x_2 \leq 450$ $x_2 \geq 0 x_2 \geq 0$ s	12 Marks	L3	CO4	PO1 PO2 PO3

UNIT-V

9.		Explain the steps involved in Genetic Algorithm with a flow chart.	12 Marks	L2	CO5	PO1 PO2 PO3

(OR)

10.	a)	What is global best and local best in Particle Swarm Optimization?	4 Marks	L2	CO5	PO1 PO2 PO3
	b)	Explain the algorithm of Ant Colony Optimization.	8 Marks	L2	CO5	PO1

CODE No.: 19BT60502 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

MACHINE LEARNING

[Information Technology]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Investigate the different perspectives and issues in Machine Learning.	6 Marks	L4	CO2	PO2
	b)	Illustrate the General-to-Specific Ordering of Hypotheses using example hypotheses.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Write the algorithm for the Finding A Maximally Specific Hypothesis.	6 Marks	L3	CO3	PO1
	b)	Explain the simple learning algorithm to represent the version space.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Information gain measures the expected reduction in entropy. Justify.	6 Marks	L4	CO2	PO2
	b)	Illustrate the operations of ID3 algorithm with an example.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Explain the hypothesis space search in Decision tree learning.	6 Marks	L2	CO1	PO2
	b)	Analyze the use of kernels in SVM and which kernel can be used in the case of non-linear data.	6 Marks	L4	CO2	PO2
		UNIT-III				
5.	a)	Investigate the advantage of gradient descent rule over the perceptron training rule.	6 Marks	L4	CO4	PO3
	b)	Find the stochastic approximation to gradient descent rule and explain.	6 Marks	L3	CO4	PO2
		(OR)				
6.	a)	Derive the gradient descent training rule and explain the steps with necessary equations.	6 Marks	L3	CO4	PO3
	b)	Explain the architecture of a typical multilayer neural network and illustrate its decision surface.	6 Marks	L2	CO4	PO2
		UNIT-IV				
7.	a)	Discuss in detail about maximum likelihood hypotheses for predicting probabilities.	6 Marks	L2	CO2	PO2
	b)	Apply the MDL principle to the problem of learning decision trees. Explain in detail.	6 Marks	L3	CO2	PO2
		(OR)				
8.	a)	Explain the Bayes optimal classification process in detail.	6 Marks	L2	CO2	PO2
	b)	Analyze the drawback of Bayes Optimal Classifier and advantage of Gibbs algorithm.	6 Marks	L4	CO3	PO3
		UNIT-V				
9.	a)	Discuss in detail about the locally weighted linear regression algorithm.	6 Marks	L2	CO2	PO2
	b)	Write a short note on the Radial Basis Functions.	6 Marks	L2	CO2	PO2
		(OR)				
10.	a)	Analyze the various remarks on the k-nearest neighbor algorithm.	6 Marks	L4	CO2	PO2
	b)	Describe the learning task in reinforcement learning process.	6 Marks	L2	CO2	PO2

CODE No.: 19BT71202 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations June – 2022

MOBILE APPLICATION DEVELOPMENT
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Analyze and explain the mobile user browsing behavior.	6 Marks	L2	CO1	PO1
	b)	Discuss the key principles those are followed to design the user interfaces of mobile apps.	6 Marks	L2	CO1	PO1
		(OR)				
2.		Explain the design patterns of Mobile apps.	12 Marks	L3	CO1	PO2
		UNIT-II				
3.	a)	Discuss the procedure to passing data between the activities using an Intent object.	6 Marks	L2	CO2	PO2
	b)	Develop an android program to understand the activity behavior when changes in screen orientation.	6 Marks	L3	CO2	PO3
		(OR)				
4.	a)	Develop an android program to display notifications on status bar.	6 Marks	L4	CO2	PO4
	b)	List and discuss the common attributes of Views and View Groups.	6 Marks	L2	CO2	PO2
		UNIT-III				
5.		List and discuss the Basic views in Android to design the user interface.	12 Marks	L4	CO3	PO4
		(OR)				
6.		List and discuss the picker views in Android to design the user interface with an example program.	12 Marks	L2	CO3	PO2
		UNIT-IV				
7.	a)	Develop an Android program to access a web service and returns a string of random quotes.	8 Marks	L3	CO3	PO3
	b)	Explain the methods to get location details that was touched on map by the user with a suitable program.	4 Marks	L2	CO3	PO2
		(OR)				
8.		Discuss the accessing of web services using GET method with an example program.	12 Marks	L2	CO3	PO2
		UNIT-V				
9.		Discuss the integration of Google play In-App billing into an android application.	12 Marks	L2	CO4	PO5
		(OR)				
10.		Illustrate the usage of the threads in an Android application with a suitable example.	12 Marks	L2	CO4	PO5

❀ ❀ ❀

CODE No.:14BT40503 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations August – 2021

DESIGN AND ANALYSIS OF ALGORITHMS
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Write Algorithms to illustrate UNION and FIND operations on sets.	14 Marks
		(OR)	
2	a)	Write and explain the final Algorithm for collapse Rule with an example.	7 Marks
	b)	Explain about various Asymptotic Notations.	7 Marks

UNIT-II

3	a)	Write a Pseudo code for Divide and Conquer algorithm for merging two sorted arrays into a single sorted one with example.	7 Marks
	b)	Explain graph traversal algorithm with examples.	7 Marks
		(OR)	
4	a)	Explain Strassen's matrix multiplication algorithm with example.	7 Marks
	b)	Find the Best, Worst and Average case complexities of Quick Sort algorithm.	7 Marks

UNIT-III

5		Consider n=4 and (q_1, q_2, q_3, q_4)=(do, if, int, while) and the values for p's and q's are give as p(1:4)=(3, 3, 1, 1) and q(0:4)=(2, 3, 1, 1, 1). Construct the Optimal binary search Tree.	14 Marks
		(OR)	
6		Write and explain the general method of Greedy Technique in detail.	14 Marks

UNIT-IV

7		Apply back tracking to solve sum of subsets problem for the following instance S={1,3,4,5}, d={1,2,1,3}.	14 Marks
		(OR)	
8	a)	Write a short notes on: i) Graph coloring. ii) Hamiltonian cycles.	10 Marks
	b)	Explain the general method Branch and Bound Algorithm.	4 Marks

UNIT-V

9	a)	Compare and contrast Deterministic and Non-Deterministic algorithms. Explain the Searching process using non deterministic algorithms.	7 Marks
	b)	Explain NP-hard Scheduling problems with examples.	7 Marks
		(OR)	
10		Explain the Cook's theorem with example.	14 Marks

CODE No.:14BT60101 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations August - 2021

REINFORCED CEMENT CONCRETE STRUCTURES – II

[CIVIL ENGINEERING]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	Explain the different types of stair case with neat sketch	14 Marks
	(OR)	
2	Design a dog-legged stair case for a building in which the vertical distance is 3.6m. The stair hall measures 2.5m x 5.0m. The live load may be taken as 2.5 kN/m^2. Use M20 grade concrete and Fe415 grade steel. Draw a neat sketch showing reinforcement details in the waist slab	14 Marks

UNIT-II

3	Design a combined rectangular footing for two columns C1 and C2 spaced at 3m apart. Characteristic loads on C1 and C2 are 750kN and 1000kN respectively and the size of the columns is 300mm x 600mm where 600mm size is along C1-C2. Width of the footing shall be 2m. The A.B.P on soil is 150kN/m^2.	14 Marks
	(OR)	
4	Design a pile under a column transmitting an axil load of 500kN. The pile is to be driven to a hard stratum available at a depth of 8m. Use M20 concrete and Fe: 415 steel.	14 Marks

UNIT-III

5	Describe the behaviour of the various elements of a counterfort retaining wall and write the design steps of this retaining wall.	14 Marks
	(OR)	
6	Design the counter fort retaining wall to suit the following data: Height of the wall above ground level = 6m; Density of soil: 16 kN/m^3 ; Angle of repose: 33^0; S.B.C. of soil: 160 kN/m^2; Spacing of counterforts :3m c/c	14 Marks

UNIT-IV

7	Design a rectangular water tank 5m x 4m with depth of storage 3m, resting on ground and whose walls are rigidly joined at vertical and horizontal edges. Assume M20 concrete and Fe415 grade steel. Sketch the details of reinforcement in the tank	14 Marks
	(OR)	
8	Design a conical dome roof for a room with base diameter as 10m. The live load due to wind, snow, etc may be taken as 2N/m. The height of the roof is 4m.	14 Marks

UNIT-V

9	Describe in detail the design steps for the design of chimney.	14 Marks
	(OR)	
10	Design a circular silo of 12m height and 6m internal diameter to store cement of unit weight 15.5kN/m^3 and $\phi = 25^0$.	14 Marks

CODE No.:14BT60103 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations August – 2021

TRANSPORTATION ENGINEERING - I

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) What is highway alignment? What factors are to be given consideration while fixing the alignment? Also discuss the role of obligatory points in finalizing alignment. 7 Marks

b) Calculate the length of transition curve and the shift using the following data: Design speed = 65kmph; Radius of circular curve = 220m; Allowable rate of introduction of super elevation (pavement rotated about the center line)=1 in 150; Pavement width including extra widening =7.5 m 7 Marks

(OR)

2 a) List the Drawings and Reports to be prepared in Highway Projects. 7 Marks

b) There is a horizontal highway curve of radius 400m and length 200m on highway. Compute the set-back distances required from the centre line on the inner of the curve so as to provide for: 7 Marks

i) Stopping sight distance of 90m.
ii) Safe overtaking sight distance of 300m.
iii) The distance between the centre lines of the road and the inner lane is 1.9m

UNIT-II

3 Discuss the construction of Road in water-Logged areas and explain the process of drainage of slopes and erosion control. 14 Marks

(OR)

4 The maximum quantity of water expected in one of the open longitudinal drains on clayey soil is 0.9 m^3/sec. Design the cross section and longitudinal slope of trapezoidal drain assuming the bottom width of the trapezoidal section to be 1.0m and cross slope to be 1.0 vertical to 1.5 horizontal. The allowable velocity of flow in the drain is 1.2m/sec and Manning's roughness coefficient is 0.02. 14 Marks

UNIT-III

5 a) Explain design of Dowel bars along with equations. 7 Marks

b) Calculate the stresses at interior, edge and corner regions of a cement concrete pavement using Westergaard's stress equation. Use the following data: 7 Marks
Wheel load, P=5100kg.
Modulus of elasticity of cement concrete, E=3.0×105 kg/cm^2
Pavement thickness, h=18cm
Poisson's ratio of concrete, μ=0.15
Modulus of sub grade reaction ,K=6.0 kg/cm^3
Radius of contact area, a=15cm

(OR)

6 Elaborate IRC recommended procedure for design of rigid pavements. 14 Marks

UNIT-IV

7 a) What are the materials used in Cement Concrete roads? Write the construction procedure of CC Pavements. 7 Marks

b) Write a brief note on PCC pavements. 7 Marks

(OR)

8 Write in detail with the help of neat sketches: 14 Marks

i) Compacting equipment of Asphalt Pavement.

ii) Air Compressors.

UNIT-V

9 a) Explain the causes, effects and adjustment of creep. Write short notes on the following: 7 Marks

i) Summit Curves and Valley Curves. ii) Cant deficiency.

iii) Points and Crossings. iv) Coning of wheels.

b) Discuss the theories related to creep. What are the function of various components like: 7 Marks

i) rails. ii) sleepers. iii) ballast.

(OR)

10 a) Elaborate factors affecting selection of site for Airport. 7 Marks

b) What are the different types of horizontal and vertical curves? Derive the relation between radius and versine of the curve. 7 Marks

CODE No.:14BT60207 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations August – 2021

HIGH VOLTAGE ENGINEERING
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Enumerate the various applications of insulating materials.	7 Marks
	b)	Estimate the control of electric stresses in the insulating materials.	7 Marks
		(OR)	
2	a)	Distinguish between solid, liquid, gaseous breakdown theories.	7 Marks
	b)	Discuss about the electric field stresses in the insulating materials.	7 Marks

UNIT-II

3	a)	Write about the composite dielectrics along with its properties.	7 Marks
	b)	Explain the process of thermal breakdown in solid dielectrics.	7 Marks
		(OR)	
4		State Paschen's law? How do you account for the minimum voltage for breakdown under PD condition?	14 Marks

UNIT-III

5	a)	What is a Tesla coil? How is damped high frequency oscillations obtained from a Tesla coil?	7 Marks
	b)	Explain one method of controlled tripping of impulse generators. Why is controlled tripping necessary?	7 Marks
		(OR)	
6		Why is a Cockcroft-Walton circuit preferred for voltage multiplier circuits? Explain its working with a schematic diagram.	14 Marks

UNIT-IV

7		Explain the different methods of high current measurements with their relative merits and demerits.	14 Marks
		(OR)	
8	a)	What are the conditions to be satisfied by a potential divider to be used for impulse work?	7 Marks
	b)	What is a mixed potential divider? How it is used for impulse voltage measurements?	7 Marks

UNIT-V

9		What is 'Wagner's earthing device'? Explain how it is used for eliminating stray capacitances.	14 Marks
		(OR)	
10		Explain the power frequency and impulse voltage test conducted on bushings.	14 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations August - 2021

OPERATIONS RESEARCH

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Solve the following Linear Programming Problem (LPP). 14 Marks

$Max\ Z = 4x_1 + 6x_2 + 2x_3 \quad st$

$4x_1 - 4x_2 \le 5, -x_1 + 6x_2 \le 5, -x_1 + x_2 + x_3 \le 5$

$x_i \ge 0$

(OR)

2 Solve the following LPP by using dual simplex method. 14 Marks

$Min\ Z = x_1 + 2x_2 + 3x_3$

$st \quad x_1 - x_2 + x_3 \ge 4$

$x_1 + x_2 + 2x_3 \le 8$

$x_2 - x_3 \ge 2 \quad x_i \forall i \ge 0$

UNIT-II

3 Solve the following transportation problem. Use North-West method for generating the initial basic feasible solution. 14 Marks

Demand / Factory	S_1	S_2	S_3	S_4	Supply
A	7	10	12	10	40
B	9	12	10	10	30
C	12	9	14	12	20
Requirement	25	15	30	10	

(OR)

4 The owner of a small machine shop has four machinists available to assign to jobs for the day. Five jobs are offered with the expected profit (in hundreds of rupees) for each machinist on each job being as follows. 14 Marks

Machinist	**A**	**B**	**C**	**D**	**E**
1	6	8	5	10	8
2	7	9	6	7	6
3	9	9	11	7	8
4	5	6	9	8	8

Find the assignment of machinists to jobs that result in a maximum profit. Which job should be declined?

UNIT-III

5 From the activity details given below, determine the optimal project duration by taking indirect cost as Rs.4.50/day. 14 Marks

Activity	Normal time(days)	Crash time(days)	Cost slope Rs/day
1-2	3	1	4
2-3	4	2	4
2-4	7	3	1
3-4	5	2	2

(OR)

6 A distance network consists of 11 nodes which are distributed as shown in the following table. Find the shortest path from node 1 to node 11 and the corresponding distance. 14 Marks

Arc	Distance	Arc	Distance
1-2	8	5-8	12
1-3	7	5-9	7
1-4	1	6-9	9
2-5	5	7-9	6
3-5	9	7-10	13
3-6	2	8-11	4
3-7	8	9-11	2
4-7	10	10-11	15

UNIT-IV

7 A bank has 2 tellers working on SB A/c. The first teller handles withdrawals only. The second teller handles deposits only. It has been found that the service time distribution for the deposits and withdrawals both are exponentially with mean service time of 3 minutes / customer. Depositors one found to arrive in a Poisson distribution throughout the day with mean arrival rate of 16/hr. withdrawals also arrive in a poisons fashion with mean arrival rate of 14/hr. What would be the average waiting time for depositors and withdrawals, if each teller would handle both withdrawals and deposits? What would be the effect, if this could only be accomplished by increasing the service time to 3.5 minutes? 14 Marks

(OR)

8 a) Explain about various types of customers in queuing theory. 7 Marks

b) In a railway yard goods train arrive at a rate of 30 trains/day. Assuming that the inter-arrival time follows an exponential distribution and service time distribution is also exponential with an average 36 minutes. Calculate the following: 7 Marks

i) The average number of trains in the queue.
ii) The average waiting of a train in the system.
iii) The probability that the number of trains in the system exceeds 10.

UNIT-V

9 Find the optimum strategies and value of game for the following game by graphical method. 14 Marks

		B				
A		1	2	3	4	5
	1	-1	3	4	-2	6
	2	4	2	6	3	2

(OR)

10 a) State the dominance rules used in games theory. 7 Marks

b) Obtain the optimal strategies for both persons and the value of the game for zero-sum two-person game whose payoff matrix is given as follows 7 Marks

Player B	Player A					
	1	3	-1	4	2	-5
	-3	5	6	1	2	0

CODE No.:14BT60402 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations August – 2021

MICROWAVE ENGINEERING

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain and derive the expression for quality factor Q of microstrip line.	10 Marks
	b)	Explain various applications of Microwaves	4 Marks

(OR)

2	a)	Prove that the rectangular waveguide is high pass filter. Define the terms cut-off frequency and cut-off wavelength.	7 Marks
	b)	Show that the velocity of the wave in waveguides is a function of frequency. What is guide wavelength?	7 Marks

UNIT-II

3	a)	Derive the scattering matrix of E-plane Tee.	7 Marks
	b)	With a neat diagram, explain the dielectric and rotary wave phase shifters.	7 Marks

(OR)

4		Write short notes on the following. i) Directional coupler. ii) Wave guide windows. iii) Flap attenuator.	14 Marks

UNIT-III

5	a)	List the classification of microwave tubes. Differentiate between klystrons and TWT.	7 Marks
	b)	Explain how oscillations are generated in reflex klystron. How to calculate its electronic admittance?	7 Marks

(OR)

6	a)	Explain the principle of operation of two cavity Klystron with neat diagrams.	7 Marks
	b)	Derive an expression for the power output and efficiency of a two cavity Klystron.	7 Marks

UNIT-IV

7	a)	What are the salient features of TWT? How it is able to give large bandwidth.	6 Marks
	b)	A TWT operates at f = 3 GHz. The slow wave structure has a pitch angle of 5^0 and the attenuation constant is 3 Np/m. Determine the propagation constant of the travelling wave in the tube.	8 Marks

(OR)

8	a)	Draw the structure of 8 cavity magnetron and explain its bunching process.	7 Marks
	b)	Explain how cross field is used to generate oscillations in Magnetron.	7 Marks

UNIT-V

9	a)	Explain the operation of Gunn diode along with its V-I characteristics.	7 Marks
	b)	Give the microwave bench setup to measure wavelength of a given signal.	7 Marks

(OR)

10	a)	Explain the measurement procedure for Q-factor of a resonant cavity.	7 Marks
	b)	Explain in detail about RWH theory.	7 Marks

CODE No.:14BT60403 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations August – 2021

VLSI DESIGN

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	With neat diagrams, explain the different steps in n-well fabrication of CMOS transistors.	8 Marks
	b)	Define threshold voltage of a MOS device and explain its significance.	6 Marks
		(OR)	
2	a)	Illustrate an equation for I_{DS} of an n-channel Enhancement MOSFET operating in linear region.	8 Marks
	b)	Estimate g_m of the device for a PMOS transistor is operating in saturation region with the following parameters. $V_{GS} = -5V$; $V_{tp} = -1.2V$; W/L = 95; $\mu_n C_{ox} = 95\ \mu A/V^2$	6 Marks

UNIT-II

3	a)	What are various limitations of scaling?	4 Marks
	b)	Design a symbolic layout for a complementary CMOS circuit that implements Y= (A+BC)**'.**	10 Marks
		(OR)	
4	a)	Drive an expression for a nMOS inverter pair delay whose transistor size is 4**:**1.	8 Marks
	b)	Drive the expression for effective resistance and capacitance estimation using RC delay models.	6 Marks

UNIT-III

5	a)	Explain the operation of 8 x 8 array multiplier with neat sketch	8 Marks
	b)	With the help of the logical schematic, explain the working of a parity generator.	6 Marks
		(OR)	
6	a)	Explain the CMOS system design based on the data path operators with a suitable example.	6 Marks
	b)	Discuss the working principle of booth multiplier with an example.	8 Marks

UNIT-IV

7	a)	Design an OR-AND PLA that provides the following outputs. F1 = M2**.** M3**.** M5 F2 = M0**.** M1**.** M4 F3 = M1**.** M2**.** M6**.** M7	8 Marks
	b)	With neat diagram, explain the operation of synchronous counter.	6 Marks
		(OR)	
8	a)	With neat sketch, explain CLB, IOB and programmable interconnects of FPGA device.	8 Marks
	b)	Compare the features of PLA, PAL, CPLD and FPGAs.	6 Marks

UNIT-V

9	a)	Explain the various logic synthesis tools available for ASIC and FPGA-based design.	7 Marks
	b)	Explain various types of simulation.	7 Marks

(OR)

10	a)	What is need for testing? Explain the difference between testing and verification.	6 Marks
	b)	Explain the chip level test techniques. Explain the chip level test techniques.	8 Marks

CODE No.:14BT60431 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations August – 2021

PRINCIPLES OF COMMUNICATION

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Find the Fourier transform of $\cos w_0 t$ and $\sin w_0 t$. Compare their power spectral densities.	7 Marks
	b)	A signal x(t) is having a fourier Transform of x(f). Find the Fourier Transform of dx(t)/dt.	7 Marks
		(OR)	
2	a)	Explain the effect of PSD on Transfer function.	7 Marks
	b)	Show that $R_{12}(\tau)=R_{21}(-\tau)$.	7 Marks

UNIT-II

3	a)	Explain the operation of envelop detector with a neat circuit diagram.	7 Marks
	b)	Draw the spectrum of WBFM and explain the effect of modulation index on the spectrum.	7 Marks
		(OR)	
4	a)	Explain clearly about pre-emphasis and de-emphasis in FM wave.	7 Marks
	b)	Explain the difference between DSB and SSB system.	7 Marks

UNIT-III

5	a)	Explain the generation and detection of PPM signal.	8 Marks
	b)	Assess the effect of aliasing in sampling process.	6 Marks
		(OR)	
6	a)	Compare FDM and TDM. What is meant by an asynchronous multiplexing?	7 Marks
	b)	Explain the methods for demodulation of PAM signals.	7 Marks

UNIT-IV

7	a)	Derive the expression for signal to quantization noise ratio for PCM system that employs linear quantization technique. Assume the input to the PCM system is a sinusoidal signal.	7 Marks
	b)	Distinguish between QPSK and MSK.	7 Marks
		(OR)	
8	a)	Explain the delta modulation with block diagram. Discuss the disadvantages of delta modulation.	8 Marks
	b)	Discuss coherent, non coherent detection of ASK.	6 Marks

UNIT-V

9	a)	Discuss the viterbi algorithm with example.	7 Marks
	b)	What is the use of syndrome? Draw the (n-k) syndrome calculation circuit for (n,k) cyclic code? Explain.	7 Marks
		(OR)	
10	a)	Find a generator polynomial for a (7, 4 cyclic code and hence find the code word for[1000].	7 Marks
	b)	Consider 5 messages with probabilities 0.22, 0.34, 0.17, 0.19, 0.08 are transmitted. Estimate its coding efficiency using Huffman code.	7 Marks

❀ ❀ ❀

CODE No.:14BT60201 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations January - 2022

MICROPROCESSORS AND MICROCONTROLLERS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Illustrate 8086 Physical address generation using segment base and offset with an example. What are the advantages of doing so? 7 Marks

b) What is the difference between Macro and Procedure? Support your discussion with suitable programs. 7 Marks

(OR)

2 a) Review Intel 8086 register organization. 7 Marks

b) Summarize 8086 string related instructions with suitable examples. 7 Marks

UNIT-II

3 a) Discuss in detail about the interrupts structure of 8086. 7 Marks

b) Draw and explain the timing diagram of memory READ operation of 8086 microprocessor. 7 Marks

(OR)

4 a) Interface two 4K x 8 EPROMS and two 4K x 8 RAM chips with 8086. Select suitable maps. 10 Marks

b) Write the functions of the following pins of 8086. 4 Marks

i) RESET. ii) NMI. iii) $\overline{BHE}$. iv) $\overline{LOCK}$.

UNIT-III

5 a) Discuss different modes of operations of 8257 during different types of transfers. 6 Marks

b) Write a program for 8086 to receive data with 8251 using polling method. 8 Marks

(OR)

6 a) Draw and discuss internal architecture of USART 8251. 7 Marks

b) Draw and discuss the architecture of 8257. 7 Marks

UNIT-IV

7 a) List out the alternate functions of port3 in 8051 microcontroller. 4 Marks

b) Explain addressing modes supported by 8051 microcontroller with examples. 10 Marks

(OR)

8 a) Draw and explain the formats of IE and PSW registers of 8051 microcontroller. 6 Marks

b) Explain the following instructions of 8051 with suitable examples. 8 Marks

i) ACALL. ii) DJNZ. iii) LJMP. iv) SJMP.

UNIT-V

9 a) Write an assembly language program to generate a square wave of 50 Hz frequency in port 0, using timer of 8051 microcontroller. Assume XTAL=11.0592 MHz. 7 Marks

b) Explain the interrupt structure of 8051 microcontroller with neat sketches. 7 Marks

(OR)

10 a) Explain the different types of timer modes available in 8051 microcontroller and its control registers. 7 Marks

b) Explain with a neat diagram the procedure to interface a matrix keyboard to the 8051 microcontroller, explain the algorithm and write the assembly language program to interface the keyboard. 7 Marks

❀ ❀ ❀

CODE No.:14BT60402 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations January – 2022

MICROWAVE ENGINEERING

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Write the basic advantages and applications of microwaves.	7 Marks
	b)	What is meant by the dominant mode of a waveguide? What is the dominant mode in rectangular wave guide?	7 Marks
		(OR)	
2	a)	What is the measured frequency on a waveguide slotted line if the distance between adjacent minima is 1.27 cm and the width dimensions of the waveguide is 2.286 cm?	7 Marks
	b)	Derive an expression for the cutoff frequency of rectangular waveguide in terms of the dimensions of the waveguide.	7 Marks

UNIT-II

3	a)	Explain the Hybrid Ring. Compare its performance with Magic Tee.	7 Marks
	b)	With a neat diagram, explain the operation of a microwave attenuator.	7 Marks
		(OR)	
4	a)	What is magic tee? Describe its structure and list various properties of an ideal magic tee.	10 Marks
	b)	What are scattering parameters? Why they only are suitable at microwave frequencies to model a network?	4 Marks

UNIT-III

5	a)	Write about the limitations and losses in a conventional tubes when used at microwave frequencies	7 Marks
	b)	With a neat schematic, explain the working principle of single cavity Reflex Klystron.	7 Marks
		(OR)	
6	a)	How is tuning achieved in reflex klystron oscillators? Mention the tuning range of such a device.	7 Marks
	b)	Explain the bunching process of reflex klystron and also derive the equation for efficiency?	7 Marks

UNIT-IV

7	a)	Explain the salient features, performance characteristics and applications of TWT.	7 Marks
	b)	Determine the hull cutoff voltage for a given anode voltage of 26kv. Assume radii of cathode and anode cylinders as 5cm and 10cm respectively.	7 Marks
		(OR)	
8	a)	What are slow wave structures? Explain how a helical TWT achieves amplification.	7 Marks
	b)	A helical TWT has diameter of 2mm with 50 turns per cm. i) Calculate axial phase velocity. ii) Calculate anode voltage at which the TWT can be operated for useful gain.	7 Marks

UNIT-V

9	a)	Explain the modes of operation for Gunn diode.	7 Marks
	b)	Explain the operation and V-I characteristics of the varactor diode.	7 Marks
		(OR)	
10	a)	Explain the RF substitution method of measurement of attenuation.	7 Marks
	b)	Explain the measurement of low VSWR.	7 Marks

❀ ❀ ❀

CODE No.:14BT60403 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations January - 2022

VLSI DESIGN

[ELECTRONICS AND COMMUNICATION ENGINEERING]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Design CMOS using twin tub process with suitable figures.	10 Marks
	b)	Compare Bipolar and CMOS technology.	4 Marks
		(OR)	
2		Discuss all four types of alternative forms of pull ups.	14 Marks

UNIT-II

3	a)	Mention different lambda based design rules.	4 Marks
	b)	Draw the stick diagram and lay out for a 2 input NAND gate.	10 Marks
		(OR)	
4	a)	Discuss rise time and fall time estimations of a CMOS inverter.	8 Marks
	b)	Write about the scaling factors : (i) gate capacitance (ii) gate delay (iii) current density.	6 Marks

UNIT-III

5		Explain in detail about the operation of carry skip adder using example.	14 Marks
		(OR)	
6		Discuss about the classification of array multipliers and explain any one in detail.	14 Marks

UNIT-IV

7	a)	Design an OR-AND PLA that provides the following outputs: F1 = M2. M3. M5 F2 = M0. M1. M4 F3 = M1. M2. M6. M7	8 Marks
	b)	With neat diagram explain the operation of synchronous counter.	6 Marks
		(OR)	
8	a)	With neat sketch explain CLB, IOB and programmable interconnects of FPGA device.	8 Marks
	b)	Compare the features of PLA, PAL, CPLD and FPGAs.	6 Marks

UNIT-V

9	a)	Explain logic verification in detail.	7 Marks
	b)	What is logic synthesis? Show how VHDL support logic synthesis.	7 Marks
		(OR)	
10	a)	Explain the principles of manufacturing test.	4 Marks
	b)	Describe the ad hoc testing and scan based testing approaches to enhance the testability of VLSI circuits.	10 Marks

CODE No.:14BT60431 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations January – 2022

PRINCIPLES OF COMMUNICATION
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Plot the convolution of a function $f(t)$ with a pair of impulses.	7 Marks
	b)	Find the Fourier transform of a signal $x(t)=te^{-at}u(t)$.	7 Marks
		(OR)	
2	a)	Find the Fourier transform of $x(t) = 2/1+t^2$.	7 Marks
	b)	Explain Autocorrelation of a periodic waveform.	7 Marks

UNIT-II

3	a)	The output power of an AM transmitter is 1KW when sinusoidally modulated to a depth of 100%. Calculate the power in each side band when the modulation depth is reduced to 40%.	7 Marks
	b)	Explain the operation of balanced modulator.	7 Marks
		(OR)	
4	a)	Explain a method for the generation of FM.	7 Marks
	b)	Explain the operation of diode detector with necessary equations.	7 Marks

UNIT-III

5	a)	Explain the differences between DM and ADM.	7 Marks
	b)	Explain the block diagram of FDM system.	7 Marks
		(OR)	
6	a)	Compare TDM and FDM.	7 Marks
	b)	Explain the natural and flat tap sampling techniques.	7 Marks

UNIT-IV

7	a)	Define and derive an expression for quantization error.	7 Marks
	b)	With the help a neat diagram, explain the transmitter and receiver of PCM.	7 Marks
		(OR)	
8	a)	Explain about PSK, QPSK.	7 Marks
	b)	Explain the working of Coherent and non coherent PSK.	7 Marks

UNIT-V

9	a)	Define mutual information. State and prove the properties of it.	7 Marks
	b)	Explain the concept of Huffman coding technique by taking an example.	7 Marks
		(OR)	
10	a)	Explain the concept of error detection and correction using hamming codes.	7 Marks
	b)	Explain about code tree, trellis and state diagrams for a convolutional encoder.	7 Marks

CODE No.:14BT70501 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations January - 2022

COMPILER DESIGN

[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define regular expression. Give examples of regular expressions.	6 Marks
	b)	Develop a lexical analyzer to recognize a few patterns in PASCAL, C and FORTRAN (eg: identifiers, constants and operators)	8 Marks
		(OR)	
2	a)	Distinguish between: i) pass and phase. ii) lexeme and token.	7 Marks
	b)	Write short notes on different Compiler-Construction Tools.	7 Marks

UNIT-II

3	a)	Explain the Non-Recursive predictive parsing with an example.	7 Marks
	b)	Verify whether the following grammar is LL(1) Grammar or not. $S \rightarrow iEtSS^1 / a \quad S^1 \rightarrow eS / \varepsilon \quad E \rightarrow b.$	7 Marks
		(OR)	
4	a)	Construct Canonical LR(1) Parsing table for the grammar $S \rightarrow CC$, $C \rightarrow cC$, and $C \rightarrow d$.	7 Marks
	b)	What is a Handle pruning? List down the conflicts during Shift - reduce parsing.	7 Marks

UNIT-III

5	a)	What is type checker? Write translation scheme for type checking of expressions	10 Marks
	b)	Give an example each for implicit and explicit type conversion.	4 Marks
		(OR)	
6	a)	What is an L-attributed definition? Give one example and draw annotated parse tree for a sentence generated by the example grammar.	7 Marks
	b)	Write a syntax directed definition to convert the given binary number with its decimal equivalent.	7 Marks

UNIT-IV

7	a)	Explain the implementation of a simple stack - allocation scheme.	6 Marks
	b)	What are the problems with implementing dynamic memory allocation in a Compiled language? Explain.	8 Marks
		(OR)	
8	a)	Give the structure of a symbol table for the following 3 dimensional array. ARRAY (-10; 20, N: M, O: M+L).	8 Marks
	b)	Compare Static and Stack storage allocation strategies.	6 Marks

UNIT-V

9	a)	Explain the principles of source optimization in detail.	7 Marks
	b)	Construct DAG for the following basic block. d:=b*c e:=a+b b:=b*c a:=e-d	7 Marks
		(OR)	
10	a)	Explain how the following techniques help code optimization: i) Code Motion. ii) Strength Reduction.	8 Marks
	b)	What is a basic block? With suitable examples, discuss various transformations on the basic block.	6 Marks

❀ ❀ ❀

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations June – 2022

MICROPROCESSORS AND MICROCONTROLLERS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Discuss the advantages offered by inheriting Pipelining and Segmentation in 8086 internal architecture	7 Marks
	b)	Recall Intel 8086 Flag register and outline the function of each bit.	7 Marks
		(OR)	
2	a)	Sketch how memory is organized in Intel 8086 as even and odd banks and point out how a byte and word are accessed.	7 Marks
	b)	What is an assembler directive? List few Assembler directives supportable for Intel 8086 with examples.	7 Marks

UNIT-II

3	a)	Compose Intel 8086 Interrupt supporting structure.	7 Marks
	b)	Interface 4KX8 EPROM and 8Kx8 RAM to Intel 8086 starting at FF000H and 00000H respectively.	7 Marks
		(OR)	
4	a)	Contrast Minimum to Maximum modes of 8086 operation with suitable block diagrams.	7 Marks
	b)	Interpret the functionality of following pins in Intel 8086. i) HOLD ii) ALE iii) $\overline{BHE}$ iv) READY	

UNIT-III

5	a)	Explain how to interface Analog-to-Digital Converter (ADC) to 8086 processor. Give the hardware and software for it.	10 Marks
	b)	Discuss the status word format of 8251.	4 Marks
		(OR)	
6	a)	Explain the different operating modes of 8255 PPI chip.	6 Marks
	b)	Write a program for 8086 to transmit data with 8251 using polling method.	8 Marks

UNIT-IV

7	a)	List out the alternate functions of port3 in 8051 microcontroller.	4 Marks
	b)	Explain addressing modes supported by 8051 microcontroller with examples.	10 Marks
		(OR)	
8	a)	Draw and explain the formats of IE and PSW registers of 8051 microcontroller.	6 Marks
	b)	Explain the following instructions of 8051 with suitable examples.	8 Marks

i) ACALL ii) DJNZ iii) LJMP iv) SJMP

UNIT-V

9 a) Write an 8051 ALP to transfer the message "HELLO" serially at 9600 baud, 8-bit, 1 stop bit. 10 Marks

b) Discuss about various modes of operations of timer in 8051. 4 Marks

(OR)

10 a) Interface push button switches and LEDs to 8051 microcontroller. Give the suitable hardware and software details. 10 Marks

b) Discuss the advantages of microcontroller based system over microprocessor based systems. 4 Marks

CODE No.:14BT60303 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations June – 2022

HEAT TRANSFER
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	The temperatures on the two surfaces of a 25mm thick steel plate (k=48 W/mk), having a uniform heat generation of $30x10^6 W/m^3$, are at 180^oC and 120^oC. Determine (i) The temperature distribution across the plate. (ii) The value and position of maximum temperature. (iii) The flow of heat from each surface of the plate.	10 Marks
	b)	State different types of boundary conditions applied to heat conduction problems.	4 Marks

(OR)

2		Derive the general two-dimensional unsteady state heat conduction equation for an isotropic solid cylindrical rod with internal heat generation. Simplify the obtained equation to Poisson's equation, Fourier's equation and Laplace equation.	14 Marks

UNIT-II

3	a)	Derive expression for the "temperature distribution" and the "rate of heat flow" for the case of short fin end insulated.	10 Marks
	b)	Sketch four different types of fin configurations.	4 Marks

(OR)

4	a)	Define lumped heat analysis.	4 Marks
	b)	A stainless steel rod of outer diameter 1 cm originally at a temperature of 320^0C is suddenly immersed in a liquid at 120^0C for which the convective heat transfer coefficient is 100 W/m^2K. Determine the time required for the rod to reach a temperature of 200^0C.	10 Marks

UNIT-III

5		Air at 20°C flows over a flat plate having a uniform heat flux of 800 W/m^2. The flow velocity is 4 m/s and the length of the plate is 1.2 m. Determine the value of heat transfer coefficient and also the temperature of the plate as the air leaves the plate.	14 Marks

(OR)

6	a)	Air at 4×10^{-4} kg/s and 27ºC enters a triangular duct that is 20 mm on a side and 2 m long. The duct surface is maintained at 100ºC. Assuming fully developed flow through the duct, determine air outlet temperature.	8 Marks
	b)	Explain with neat sketch how the flow and temperature development in the entrance region of pipe differs among air, water and liquid metals.	6 Marks

UNIT-IV

7	a)	Define condensation and Differentiate filmwise and dropwise condensation.	6 Marks
	b)	Water is boiled at the rate of 25 kg/h in a polished copper pan, 280 mm in diameter, at atmospheric pressure. Assume nucleate boiling conditions, calculate the temperature of the bottom surface of the pan.	8 Marks

(OR)

8 a) Explain the conditions under which drop wise condensation can take place. Why does the rate of heat transfer in drop-wise condensation many times larger than in film-wise condensation? 7 Marks

b) Dry saturate steam at a pressure of 2.45 bar condenses on surface of a vertical tube of height 1m. The tube surface temperature is kept at 117^0C. Estimate the thickness of the condensate film and local heat transfer coefficient at a distance of 0.2 m from the upper end of the tube. 7 Marks

UNIT-V

9 A truncated cone has top and bottom diameters of 20 cm and 10 cm respectively and a height of 10 cm. calculate the shape factor between the top surface and side (conical surface). Also the shape factor between the side and itself. The fraction of radiation leaving the top surface which is intercepted by the bottom surface is 0.12. 14 Marks

(OR)

10 a) What is the shape factor with respect to itself if the surface is concave, convex or flat? 7 Marks

b) Show that for two infinite parallel gray planes exchanging radiant energy, the mean emissivity is given by $\left[1/\left(\frac{1}{\varepsilon 1}+\frac{1}{\varepsilon 2}-1\right)\right] S$ 7 Marks

CODE No.: 14BT60402 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations June - 2022

MICROWAVE ENGINEERING

[ELECTRONICS AND COMMUNICATION ENGINEERING]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Derive the relationship between λg, λc and λo in a waveguide.	7 Marks
	b)	A rectangular waveguide with dimensions 4×2 cms operates for the TM11 mode at 10GHz .Determine the characteristics wave impedance.	7 Marks
		(OR)	
2	a)	What is Q-factor .Derive the expression for the quality factor-Q for rectangular cavity resonator?	7 Marks
	b)	The dimensions of a guide are 2.5cm×1cm, the frequency is 8.6GHz. Find the following : i) Possible modes; ii) Cut-off frequency; iii) Guide wavelength	7 Marks

UNIT-II

3		Write short notes on: i) Wave guide Irises ii) Rat-Race hybrid Tee iii) Dielectric phase shifters	14 Marks
		(OR)	
4	a)	What are ferrites and give their properties?	7 Marks
	b)	Calculate the coupling factor of the directional coupler when incident power is 600 mW and power in the auxiliary wave guide is 350 μW.	7 Marks

UNIT-III

5	a)	List the performance characteristics and applications of a typical reflex klystron.	7 Marks
	b)	A two cavity klystron amplifier has the following characteristics, Voltage gain = 15 dB, Input power= 5 mW, R_{sh} of Input cavity = 30 Kilo-ohms, R_{sh} of Output cavity = 40 Kilo-ohms, R_L (Load impedance) = 40 Kilo-ohms, Determine: i) The input rms voltage; ii) The output rms voltage; iii) The power delivered to the load.	7 Marks
		(OR)	
6	a)	Draw beam current waveforms of a klystron for at least four values of bunching parameters. Write an expression for the bunching parameter and specify each quantity in the expression.	7 Marks
	b)	Describe how velocity modulation is converted to current modulation in two cavity klystron amplifier.	7 Marks

UNIT-IV

7	a)	Explain the salient features, performance characteristics and applications of TWT.	7 Marks

b) A normal circular magnetron has the following parameters Inner Radius R_a = 0.15 m, Outer Radius R_o = 0.45 m, Magnetic flux density =1.2 mW b/m^2. 7 Marks

i) Determine the Hull cut off voltage.

ii) Determine the cut off magnetic flux density if the beam voltage Vo as 6000V.

iii) Determine the cyclotron frequency in GHz.

(OR)

8 a) What are slow wave structures? Explain how a helical TWT achieves amplification. 7 Marks

b) A helical TWT has diameter of 2mm with 50 turns per cm. i) Calculate axial phase velocity. ii) Calculate anode voltage at which the TWT can be operated for useful gain. 7 Marks

UNIT-V

9 a) Explain how the VSWR for a short circuit is measured. 7 Marks

b) What is Gunn effect and What are its salient features? 7 Marks

(OR)

10 a) Describe how power can be measured using Bolometer technique. 7 Marks

b) Explain a method of measuring impedance of a terminating load in a microwave system. 7 Marks

CODE No.:14BT60403 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations June – 2022

VLSI DESIGN

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Discuss the performance of BICMOS technology.	4 Marks
	b)	Define threshold voltage of a MOS device and explain its significance.	4 Marks
	c)	Derive the pull up to pull down ratio for an NMOS inverter.	6 Marks
		(OR)	
2		Write a short notes on:	
	a)	BICMOS inverter with a suitable diagram.	8 Marks
	b)	Pass transistor logic	6 Marks

UNIT-II

3	a)	Draw the schematic and layout diagram of 2-input CMOS NAND gate.	8 Marks
	b)	What are the various scalable design rules for λ-based technology?	6 Marks
		(OR)	
4	a)	Explain why different criteria might be used to size transistors in tightly coupled small-fan-out circuits versus widely spaced high-fan-out circuits.	8 Marks
	b)	What is Resistive Interconnect delay? Why is it present in logic circuits?	6 Marks

UNIT-III

5	a)	Implement a look-up table based full adder using suitable ROM.	7 Marks
	b)	Design a logarithmic shifter circuit using CMOS.	7 Marks
		(OR)	
6	a)	Why do we go for Carry Look-Ahead Adder? Develop the circuits for Propagate (Pi) and Generate (Gi) terms needed for a 4-bit CLA.	10 Marks
	b)	Draw and explain zero/one detection circuit.	4 Marks

UNIT-IV

7	a)	Explain in detail about FPGA architecture.	7 Marks
	b)	Design Full adder using PLA.	7 Marks
		(OR)	
8		Discuss different FPGA architectures in detail.	14 Marks

UNIT-V

9	a)	Explain the various logic synthesis tools available for ASIC and FPGA-based design.	7 Marks
	b)	Explain various types of simulation.	7 Marks
		(OR)	
10	a)	What is need for testing? Explain the difference between testing and verification.	6 Marks
	b)	Explain the chip level test techniques. Explain the chip level test techniques.	8 Marks

❀ ❀ ❀

CODE No.:14BT60431 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations June – 2022

PRINCIPLES OF COMMUNICATION
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain Autocorrelation of a periodic waveform.	7 Marks
	b)	Draw the impulse responses of $Sin\omega_0(t)$ and $Cos\omega_0(t)$.	7 Marks
		(OR)	
2	a)	Find the Fourier transform of $x(t) = 2/1+t^2$.	7 Marks
	b)	Plot the convolution of a function f(t) with a pair of impulses.	7 Marks

UNIT-II

3	a)	Explain the operation of envelop detector with a neat circuit diagram.	7 Marks
	b)	Draw the spectrum of WBFM and explain the effect of modulation index on the spectrum.	7 Marks
		(OR)	
4	a)	Explain clearly about pre-emphasis and de-emphasis in FM wave.	7 Marks
	b)	Explain the difference between DSB and SSB system.	7 Marks

UNIT-III

5	a)	Explain the generation and detection of PPM signal.	8 Marks
	b)	Assess the effect of aliasing in sampling process.	6 Marks
		(OR)	
6	a)	Compare FDM and TDM. What is meant by an asynchronous multiplexing?	7 Marks
	b)	Explain the methods for demodulation of PAM signals.	7 Marks

UNIT-IV

7	a)	Define and derive an expression for quantization error.	7 Marks
	b)	With the help a neat diagram, explain the transmitter and receiver of PCM.	7 Marks
		(OR)	
8	a)	Explain the delta modulation with block diagram. Discuss the disadvantages of delta modulation.	8 Marks
	b)	Discuss coherent, non coherent detection of ASK.	6 Marks

UNIT-V

9	a)	Define mutual information. State and prove the properties of it.	7 Marks
	b)	Explain the concept of Huffman coding technique by taking an example.	7 Marks
		(OR)	
10	a)	Explain the concept of error detection and correction using hamming codes.	7 Marks
	b)	Explain about code tree, trellis and state diagrams for a convolutional encoder.	7 Marks

❀ ❀ ❀

CODE No.: 16BT3HS02 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

MANAGERIAL ECONOMICS AND PRINCIPLES OF ACCOUNTANCY
[Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define Demand and explain its determinants.	CO1	7 Marks
	b)	Discuss about types of Price Elasticity of Demand with examples.	CO1	7 Marks

(OR)

2.		What is Demand Forecasting? Explain about different methods of Demand Forecasting.	CO2	14 Marks

UNIT-II

3.		Discuss the following: i) Fixed costs *Vs.* Variable costs. ii) Separable Costs *Vs.* Joint costs. iii) Avoidable Costs *Vs.* Unavoidable costs.	CO1	14 Marks

(OR)

4.		From the following particulars calculate the Break-Even Point in terms of both quantity and value: Production in units : 20,000 Sales price : Rs.6/- per unit Variable costs : Rs.40,000/- Fixed costs : Rs.24,000/-	CO2	14 Marks

UNIT-III

5.		What is Perfect Competition? Explain its features in detail.	CO4	14 Marks

(OR)

6.		Explain the following: i) Marginal cost pricing. ii) Cost plus pricing. iii) Skimming pricing. iv) Peak load pricing.	CO3	14 Marks

UNIT-IV

7.		Define double entry book keeping and explain its importance with an example.	CO3	14 Marks

(OR)

8.		Write and explain in detail about various types of Capital.	CO4	14 Marks

UNIT-V

9.		What is a Profit and Loss account? Mention briefly the advantages of preparing a Profit and Loss account.	CO1	14 Marks

(OR)

10. The following is the Trial Balance as on 31-03-2018. Prepare Trading and Profit and Loss Account and Balance Sheet CO4 14 Marks

Particulars	Debit (Rs.)	Credit (Rs.)
Stock (01-04-2017)	14,000	
Purchases	1,26,000	
Wages	50,500	
Sales		2,20,000
Salaries	16,000	
Carriage inward	9,100	
Rent and Rates	5,200	
Insurance	1,320	
Machinery	52,000	
Capital		1,45,600
Building	67,000	
Sundry debtors	44,000	
Furniture	3,350	
General expenses	2,600	
Sundry creditors		20,000
Cash in hand	1,930	
Bad debt	1,020	
Bank	6,580	
Secured Loan		15,000
	4,00,600	**4,00,600**

Adjustments to be made:

i) Stock on 31-03-2018 was Rs.20,600/-

ii) Depreciate machinery at 10% p.a.

iii) Make provision @5% for bad and doubtful debts.

iv) Provide discount on debtors @2.5%.

v) Insurance prepaid Rs.120.

CODE No.: 16BT5HS01 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

MANAGEMENT SCIENCE

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the functions of Management.	CO1	7 Marks
	b)	Define Organization. Write the objectives and principles of Organization.	CO1	7 Marks

(OR)

2.	a)	Write the nature and importance of Management.	CO3	7 Marks
	b)	What is Line Organization? Write the benefits of line Organization.	CO3	7 Marks

UNIT-II

3.	a)	Define Marketing? Write functions of Marketing.	CO2	7 Marks
	b)	Explain the classical model of E.O.Q.	CO2	7 Marks

(OR)

4.	a)	Write short notes on: i) Just in Time. ii) Work study.	CO1	4 Marks
	b)	The data given below shows the details for the inspection of 10 consecutive batches:	CO4	10 Marks

Batch No.	1	2	3	4	5	6	7	8	9	10
No. of pieces inspected	175	181	208	166	217	158	199	220	162	212
No. of defectives	5	10	7	4	8	6	7	5	3	5

Construct a chart showing the control and warning limits.

UNIT-III

5.	a)	Write the role of H.R manager in an Organization.	CO1	7 Marks
	b)	Explain Herzberg's two factor theory of motivation with suitable examples.	CO1	7 Marks

(OR)

6.	a)	Briefly explain the nature and scope of H.R.M.	CO1	7 Marks
	b)	Define Job Evaluation. Explain the importance of Job Evaluation.	CO1	7 Marks

UNIT-IV

7.	a)	Discuss the role of women in an Entrepreneurship.	CO5	7 Marks
	b)	Write the differences between Entrepreneur and Manager.	CO5	7 Marks

(OR)

8. The activity details along with time estimates in days and precedence relationships are given below: CO4 14 Marks

Activity	Predecessor	Time estimate		
		Optimistic	Most likely	Pessimistic
A	-	4	6	8
B	A	5	7	15
C	A	4	8	12
D	B	15	20	25
E	B	10	18	26
F	C	8	9	16
G	E	4	8	12
H	D,F	1	2	3
I	G,H	6	7	8

i) Construct network diagram for the project.
ii) Determine the critical path and compute the expected completion time.
iii) Determine the probability of completing the project in 65 days.

UNIT-V

9. a) What is E.R.P? Explain its subsystems with suitable examples. CO1 7 Marks
b) What do you mean by Globalisation? Explain the importance of Globalisation. CO2 7 Marks

(OR)

10. a) What is B.P.O? Explain the features of B.P.O. CO6 7 Marks
b) Write the importance of Material Requirements Planning. CO1 7 Marks

CODE No.: 16BT6HS01 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

BANKING AND INSURANCE

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	What is banking? Explain the functions of banking.	CO1	14 Marks
	(OR)		
2.	Describe the functions of Reserve Bank of India (RBI).	CO1	14 Marks

UNIT-II

3.	Explain about anti money laundering with examples.	CO2	14 Marks
	(OR)		
4.	Illustrate the different types of accounts in banks.	CO2	14 Marks

UNIT-III

5.	Write about the Electronic purses and Debit cards.	CO2	14 Marks
	(OR)		
6.	Explain about the Business models of B2B and B2C with examples.	CO2	14 Marks

UNIT-IV

7.	Write and describe the elements of insurance.	CO3	14 Marks
	(OR)		
8.	"Insurance as a risk mitigating mechanism". Explain.	CO3	14 Marks

UNIT-V

9.	Differentiate LIC and GIC with examples.	CO1	14 Marks
	(OR)		
10.	Write about Insurance Players in India.	CO4	14 Marks

CODE No.: 16BT6HS02 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

BUSINESS COMMUNICATION AND CAREER SKILLS
[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		List the characteristics of communication and discuss the barriers to effective communication.	CO2	14 Marks
		(OR)		
2.	a)	Elaborate Upward and Downward communication.	CO2	7 Marks
	b)	Elaborate Horizontal communication.	CO2	7 Marks

UNIT-II

3.		Define Corporate communication. Explain about Corporate communication strategy	CO1	14 Marks
		(OR)		
4.		Describe the steps involved in communicating Corporate social responsibility of an Organization.	CO2	14 Marks

UNIT-III

5.	a)	How does general writing differ from business writing?	CO3	7 Marks
	b)	Discuss the various types of business messages.	CO1	7 Marks
		(OR)		
6.		Describe the various strategies followed for writing the body of a letter.	CO1	14 Marks

UNIT-IV

7.		How does a resume affect your employability? What are the components of resume?	CO4	14 Marks
		(OR)		
8.	a)	How do you differentiate traditional resume and electronic resume?	CO3	7 Marks
	b)	State the components of video resume.	CO4	7 Marks

UNIT-V

9.		State the importance of non verbal aspects in interviews.	CO5	14 Marks
		(OR)		
10.	a)	Summarize the elements involved in Panel Interview	CO6	7 Marks
	b)	Summarize the elements involved in Telephone Interview.	CO6	7 Marks

CODE No.: 16BT6HS11 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

PERSONALITY DEVELOPMENT

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		"Success is a peak and cannot be reached in a leap". Discuss the implications of the above statement.	CO1	14 Marks
		(OR)		
2.	a)	Self-confidence is both a cause and consequence of Self-esteem. Explain.	CO1	7 Marks
	b)	**Loyalty *vs* Self-esteem : a case study** Lauren's first job after graduation from Santa Clara University was working as a quality engineer with a highly respected technology company. She had to monitor the manufacturing process and make sure that all products met customer specifications. Just three months into her position, the company booked a very large deal with a strategic customer, helping establish the company's dominance in the industry. Specifically, Lauren's company was designing a device that would be integrated into another company's product. The customer contracted out this work because they were experiencing rapid growth and cannot meet demand otherwise. They picked Lauren's company because of its good reputation and fast turnaround time. Lauren's role was to test the new device and make sure it met technical and environmental specifications, particularly functionality under extreme conditions, such as high humidity. The test results showed that the products did not meet the quality standards agreed upon, but only by a very small margin. Her general manager instructed her to push it through anyway, stating that the risk of failure was not great enough to delay mass production. Moreover, the likelihood of the product ever being placed in such extreme situations was so small that the manager did not feel jeopardizing the contract was worth it. Lauren spoke to her immediate boss, who worked under her general manager, and he also advocated pushing the product through to production. She was faced with the choice of ignoring company protocols or going against management. Sweeping the problem under the rug would require Lauren to sign off on a report that she knew to be fraudulent. She also knew that if she went to upper management her working relationships with her immediate bosses would be strained, maybe even preventing her success in the company. Not to mention, the company would have to delay production and possibly lose the contract. What should Lauren do?	CO4	7 Marks

UNIT-II

3.		List the advantages of positive thinking and the disadvantages of negative thinking.	CO1	14 Marks

(OR)

4.	a)	"Negative thinking is the early stage of the chronic illness called pessimism." Discuss.	CO2	7 Marks
	b)	How do positive greetings, enthusiasm and a sense of humour help in the work place?	CO2	7 Marks

UNIT-III

5.		List the ways employers can encourage and inspire critical thinking in their employees.	CO2	14 Marks

(OR)

6.	a)	Define Stress management.	CO1	7 Marks
	b)	How can stress affect productivity and success?	CO3	7 Marks

UNIT-IV

7.		Discuss the six leadership qualities that a good leader should possess.	CO1	14 Marks

(OR)

8.	a)	"A leader is one who knows the way, goes the way, and shows the way" Elaborate how these leadership qualities contribute to workplace success.	CO4	7 Marks
	b)	Contrast the above with the team spirit of the rest of the members.	CO4	7 Marks

UNIT-V

9.		"One should make sure of the rules of one's job by the end of the first day of employment." Justify the statement.	CO5	14 Marks

(OR)

10.	a)	Evaluate the purpose of form "W-4"	CO5	7 Marks
	b)	What is Job description? Why should it be studied closely?	CO2	7 Marks

CODE No.: 16BT30503 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

PYTHON PROGRAMMING
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the fundamental concepts of Computer Algorithms.	CO1	7 Marks
	b)	Describe the importance of Computational Problem Solving Characteristics in detail.	CO2	7 Marks
		(OR)		
2.	a)	Explain in detail about the variables and Identifiers in Python Programming.	CO1	7 Marks
	b)	Mention any five operations in Python.	CO1	3 Marks
	c)	Write a simple program in python to print greatest number in given three numbers.	CO2	4 Marks

UNIT-II

3.	a)	Explain "for" statement in python with an example.	CO1	7 Marks
	b)	Write a python script to calculate sum of individual digits of a given number using "for".	CO4	7 Marks
		(OR)		
4.	a)	Differentiate between the Selection Control and Iterative Control.	CO2	7 Marks
	b)	Illustrate the importance of implementation of Sets in Python.	CO1	7 Marks

UNIT-III

5.	a)	Write a short note on recursive problem solving. How it is differed from normal function calling? Justify.	CO3	10 Marks
	b)	Explain the concept of using text files in detail with an relevant examples.	CO2	4 Marks
		(OR)		
6.	a)	Illustrate with a program, the concept of Cigarette Use/Lung Cancer Correlation program with justification.	CO4	9 Marks
	b)	Describe the String Processing in detail in python programming.	CO1	5 Marks

UNIT-IV

7.	a)	Elucidate the turtle graphics, how are helpful in creating the graphics window? Justify the concept with exploration of relevant programs.	CO3	7 Marks
	b)	Develop a simple python program for bouncing ball using multiple turtles concept.	CO5	7 Marks
		(OR)		
8.		Illustrate the concept of Inheritance in detail? Explain the types of Inheritance with respective examples in python programming.	CO5	14 Marks

UNIT-V

9.	a)	Explain in detail the Binding events.	CO1	7 Marks
	b)	Describe the usage of Tkinter extensions and structures.	CO2	7 Marks
		(OR)		
10.	a)	Write a short note on Tkinter coding alternatives in detail.	CO1	7 Marks
	b)	Develop a reusable GUI component with classes like dialogs, check buttons and radio buttons.	CO3	7 Marks

CODE No.: 16BT40502 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

DATABASE MANAGEMENT SYSTEMS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Illustrate the Data Models in detail.	CO1	7 Marks
	b)	Describe Schema and Instance with an example.	CO1	7 Marks
		(OR)		
2.	a)	What are the different types of database users? Discuss the main activities of each.	CO1	7 Marks
	b)	Explain the conceptual design with the ER model.	CO3	7 Marks
		UNIT-II		
3.	a)	Explain the Relational calculus in brief.	CO4	7 Marks
	b)	What is a View? Explain the SQL constructs to modify the structure of tables.	CO3	7 Marks
		(OR)		
4.	a)	Explain the Integrity constraints over relations in detail.	CO2	7 Marks
	b)	Describe the various types of Join with an example.	CO3	7 Marks
		UNIT-III		
5.	a)	Illustrate the problems caused by redundancy. Give examples of insertion, updation and deletion anomalies.	CO2	7 Marks
	b)	Describe 1NF, 2NF and 3NF with a suitable example.	CO2	7 Marks
		(OR)		
6.	a)	Write about Set comparison operators.	CO3	7 Marks
	b)	Explain the Closure of a Set of FDs with an example.	CO2	7 Marks
		UNIT-IV		
7.	a)	Describe the Implementation of Atomicity and Durability.	CO4	7 Marks
	b)	Explain in detail the Validation based protocols.	CO3	7 Marks
		(OR)		
8.	a)	Explain how granularities of locking affect the performance of concurrency control algorithm.	CO3	7 Marks
	b)	Describe timestamp ordering concurrency control techniques.	CO3	7 Marks
		UNIT-V		
9.	a)	Explain ISAM in detail.	CO5	7 Marks
	b)	Explain in detail the tree structured indexing with neat sketch.	CO5	7 Marks
		(OR)		
10.	a)	Write short note on comparison of File organizations.	CO5	7 Marks
	b)	Apply the concept of B+ tree to implement multilevel indexing.	CO6	7 Marks

CODE No.: 16BT41202 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August – 2021

JAVA PROGRAMMING

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Explain the iteration statements used in java.	CO1	9 Marks
	b)	Write short notes on garbage collection in java.	CO1	5 Marks
		(OR)		
2.	a)	Explain the java buzzwords in detail.	CO1	8 Marks
	b)	Write a java program to print Fibonacci series using recursion.	CO3	6 Marks
		UNIT-II		
3.	a)	Explain multi level inheritance. Demonstrate the execution order of constructors in multi level inheritance with a java code.	CO3	9 Marks
	b)	What are packages? Explain the benefits of creating programs using packages.	CO1	5 Marks
		(OR)		
4.	a)	Does java supports multiple inheritance? Justify.	CO1	4Marks
	b)	Differentiate between abstract classes and interfaces.	CO1	4Marks
	c)	Write a java program on extending interface to other interface.	CO3	6Marks
		UNIT-III		
5.	a)	Explain exception handling mechanism in detail.	CO1	8 Marks
	b)	Explain methods used in inter-thread communication.	CO1	6 Marks
		(OR)		
6.	a)	Differentiate between exceptions, runtime errors and compile time errors	CO1	5 Marks
	b)	Write a java program to demonstrate multithreading using Runnable interface.	CO3	9 Marks
		UNIT-IV		
7.	a)	Demonstrate Linked List class with its methods.	CO3	7 Marks
	b)	Explain in detail about applet architecture and applet skeleton.	CO4	7 Marks
		(OR)		
8.	a)	Write an applet program reading parameters from a html file and display.	CO3	8 Marks
	b)	Illustrate about different layout managers in AWT.	CO4	6 Marks
		UNIT-V		
9.	a)	Explain in detail about various event classes.	CO1	7 Marks
	b)	Explain about any three classes and interfaces in javax. Servlet package.	CO1	7 Marks
		(OR)		
10.	a)	Explain in detail about adapter classes.	CO1	5 Marks
	b)	Write a servlet program which displays “Welcome to Servlets” on execution.	CO3	9 Marks

CODE No.: 16BT50308 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

MECHATRONICS
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.		Explain in detail about the Emerging areas in Mechatronics.	CO1	14 Marks
		(OR)		
2.	a)	Discuss a measurement system and its constituent elements.	CO1	7 Marks
	b)	What are the major advantages of using Microprocessor based controllers? Explain with example.	CO2	7 Marks
		UNIT-II		
3.	a)	Explain Dynamic characteristics of transducer and their effect on performance of transducer.	CO1, CO3	7 Marks
	b)	Explain the components of hydraulic activation system with neat sketch and block diagram. Distinguish between Servo valve and Direct Control valve.	CO2	7 Marks
		(OR)		
4.	a)	Explain the working and types of a stepper motor. In detail.	CO2	7 Marks
	b)	Describe the use of Eddy Current and Capacitance for proximity sensing.	CO2	7 Marks
		UNIT-III		
5.	a)	What is Data acquisition? Explain with a block diagram, the DAQ System.	CO3	7 Marks
	b)	Explain in detail Analogue to Digital Conversion process.	CO3	7 Marks
		(OR)		
6.	a)	What do you mean by the time Filtering and filter? How are filters classified?	CO3	7 Marks
	b)	Explain the working of op-Amp as Sample and hold circuit.	CO3	7 Marks
		UNIT-IV		
7.	a)	What are the limitations of a two - step (on - off) control and in what situation is such a control system commonly used?	CO4	7 Marks
	b)	Explain in detail adaptive control system.	CO4	7 Marks
		(OR)		
8.	a)	Discuss in detail about PI and PD mode electronic controllers.	CO4	7 Marks
	b)	Compare the control system performance for the system with a Derivative and Integral controller.	CO4	7 Marks
		UNIT-V		
9.		Explain the various stages in Mechatronics design approach and state how it differs from the traditional approach.	CO5, CO6	14 Marks
		(OR)		
10.		Device a pick and place robot system explain the various Mechatronics elements used in the design.	CO5	14 Marks

CODE No.: 16BT50501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

COMPUTER NETWORKS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		During the communication, how various layers of OSI model exchange information to establish a connection? Justify this with a suitable diagram.	CO1	14 Marks

(OR)

2.	a)	Explain how the information gets passed from one layer to the next in the TCP/IP model.	CO2	7 Marks
	b)	Compare network topologies with their performance indicator.	CO2	7 Marks

UNIT-II

3.	a)	Mention the Collision Free Protocols with an example.	CO2	7 Marks
	b)	Solve the One-bit Sliding window Protocol disadvantage in detail and specify how it can overcome.	CO2	7 Marks

(OR)

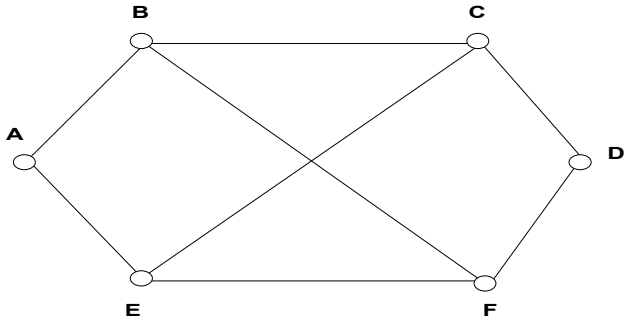
4.	a)	A bit string, 0111101111101111110, needs to be transmitted at the data link layer. What is the string transmitted after bit stuffing?	CO2	4 Marks
	b)	Explain stop and wait protocol in both noisy and noiseless channel when: i) the data is lost. ii) ACK is lost. iii) ACK is delayed.	CO2	10 Marks

UNIT-III

5.	a)	Explain steps involved in Link State Routing.	CO3	7 Marks
	b)	What is congestion, why congestion occurs, how congestion control is performed by leaky bucket algorithm?	CO3	7 Marks

(OR)

6.	a)	Describe Bellman-Ford Algorithm. What are the disadvantages of Bellman Ford Algorithm?	CO3	7 Marks
	b)	Consider the network shown in below.	CO3	7 Marks



Which uses distance vector routing? You are router C. You have just received the following distance vectors:

from B: (4, 0, 8, 13, 7, 2)
from D: (17, 11, 6, 0, 8, 10)
from E: (8, 6, 2, 10, 0, 4)

Your distances to B, D and E are 7, 4 and 6, respectively. What is your new routing table (include the distance and next hop for each destination)?

UNIT-IV

7.		Compare the TCP header and UDP header. List the field in the TCP header that is missing from UDP header. Give the reason for their absence.	CO2	14 Marks

(OR)

8.	a)	How is congestion controlled? Explain in detail about congestion control techniques in transport layer.	CO3	8 Marks
	b)	What is meant by data encapsulation? Explain data encapsulation in TCP/IP.	CO3	6 Marks

UNIT-V

9.		Infer the steps involved in DNS for resource records identification.	CO2	14 Marks

(OR)

10.	a)	Examine and discuss Electronic Mail and its services.	CO3	7 Marks
	b)	Explain in detail about HTTP.	CO3	7 Marks

CODE No.: 16BT51203 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

WEB TECHNOLOGIES

[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Write the HTML code for creating multi-line text box with necessary parameters.	CO1	7 Marks
	b)	Explain how basic and nested tables are created using HTML.	CO2	7 Marks
		(OR)		
2.	a)	Describe HTML text formatting tags with example.	CO4	7 Marks
	b)	Design a web page using HTML with image, navigation.	CO2	7 Marks
		UNIT-II		
3.	a)	Explain different types of control statements in Java script with example.	CO5	7 Marks
	b)	Define CSS. Explain inline, internal, external and embedded style sheets with examples.	CO3	7 Marks
		(OR)		
4.	a)	Write a Java script to display a given number in words.	CO4	7 Marks
	b)	Design a web page to convert Indian rupees to Foreign currency. Read the Indian rupees through input dialog and select foreign currency to which Indian rupees are converted using drop down menu.	CO6	7 Marks
		UNIT-III		
5.		Develop a mobile optimized website for displaying the images using responsive classes.	CO5	14 Marks
		(OR)		
6.	a)	Explain jQuery Selectors. Give some examples.	CO4	7 Marks
	b)	Explain HTML structure for Bootstrap with example.	CO3	7 Marks
		UNIT-IV		
7.	a)	Demonstrate the implementation of Object cloning in PHP.	CO5	7 Marks
	b)	Explain Control structures in PHP with example.	CO3	7 Marks
		(OR)		
8.	a)	Develop a PHP code to implement multi-level inheritance.	CO3	8 Marks
	b)	Explain the predefined and user defined functions in PHP with an example.	CO4	6 Marks
		UNIT-V		
9.	a)	Write a PHP code to validate the form consisting of a username, password and email fields.	CO3	7 Marks
	b)	Define a prepared statement. Explain in detail with the suitable program.	CO3	7 Marks
		(OR)		
10.	a)	Write a PHP script to retrieve the data from MySQL database.	CO4	7 Marks
	b)	Design a web page to store the Bio-data form data in the database using PHP. (Note: Bio-data page contains the fields Name, E-mail, Address, Phone number and photo).	CO6	7 Marks

❀ ❀ ❀

CODE No.: 16BT51241 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

OBJECT ORIENTED PROGRAMMING
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	How to create a two dimensional array in Java? Write a program to print unit matrix of size 5x5.	CO1	5 Marks
	b)	What is meant by parameterized constructor? Explain with an example.	CO1	9 Marks
		(OR)		
2.	a)	Illustrate how methods are overloaded in Java with an example.	CO3	7 Marks
	b)	List any five methods of string class with its syntax and example on each of it.	CO1	7 Marks

UNIT-II

3.	a)	Differentiate between this and super keyword in Java.	CO3	8 Marks
	b)	What is an abstract class? Write an example how abstract classes are created and accessed.	CO2	6 Marks
		(OR)		
4.	a)	Why java does not support multiple inheritances? How to solve this problem?	CO3, CO6	8 Marks
	b)	Elaborate the process of creating a user defined package.	CO3	6 Marks

UNIT-III

5.	a)	Illustrate the need of finally keyword in programming languages.	CO1	6 Marks
	b)	Discuss about how a user defined exception is created in Java.	CO1, CO2	8 Marks
		(OR)		
6.	a)	Describe how priorities will be used in invoking multiple threads created through Runnable interface.	CO1	7 Marks
	b)	Sketch the life cycle of a Thread and discuss about each of its state.	CO1, CO2	7 Marks

UNIT-IV

7.	a)	What is the need of Collection Classes in Java? Discuss about LinkedList class with an example.	CO2	6 Marks
	b)	Illustrate how TreeSet will be used in Collections with an example.	CO4	8 Marks
		(OR)		
8.	a)	How do you pass parameters to an Applet in Java?	CO4	7 Marks
	b)	Discuss about various layout managers available in AWT.	CO4	7 Marks

UNIT-V

9.	a)	With an example, discuss how MouseListener interface is implemented.	CO4	8 Marks
	b)	Elaborate the need of delegation event model of Java Language.	CO4	6 Marks
		(OR)		
10.	a)	Create a Servlet to read Login Credentials of a user and display that information in it.	CO6	9 Marks
	b)	Discuss about life cycle of a Servlet with its skeleton.	CO5, CO6	5 Marks

❀ ❀ ❀

CODE No.: 16BT60101 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

FOUNDATION ENGINEERING
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss in brief about various methods of boring.	CO1	8 Marks
	b)	Explain about Seismic refraction method with an aid of neat sketch.	CO1	6 Marks
		(OR)		
2.	a)	With an aid of neat sketch, discuss about static cone penetration test. Give out correlations between cone resistance (q_c) and SPT number (N).	CO1	7 Marks
	b)	Explain in brief about various design features effecting sample disturbance.	CO1	7 Marks

UNIT-II

3.	a)	Differentiate between Rankine's earth pressure theory and Coulomb's earth pressure theory.	CO1	8 Marks
	b)	A retaining wall of height 7m retains a backfill with horizontal surface. The backfill was having $\phi = 30^o$, γ_{sat}= 21kN/m^3 and γ = 17 kN/m^3. The water table is at a depth of 4m from backfill surface. Calculate the total passive earth pressure acting on retaining wall.	CO2	6 Marks
		(OR)		
4.	a)	Explain in brief about stability considerations of gravity retaining wall with a neat sketch.	CO1	7 Marks
	b)	A retaining wall with a smooth vertical back, retains a clayey backfill with c = 17 kN/m^2, $\phi = 27^o$, γ = 20 kN/m^3. Calculate the total active thrust acting on retaining wall assuming that tension crack may develop to the full theoretical depth.	CO2	7 Marks

UNIT-III

5.	a)	What are the various types of slope failure? Explain them briefly.	CO2	6 Marks
	b)	An infinite slope in sandy soil is inclined at 20^o to the horizontal has γ = 18 kN/m^3, γ_{sat} = 21 kN/m^3, $\phi = 35^o$. A hard layer exists 5m below and parallel to the surface. What is the factor of safety against slip when: (i) the slope has negligible water in it, (ii) the slope submerged with steady seepage parallel to the surface up to a height of 3m from failure surface?	CO2	8 Marks
		(OR)		
6.	a)	Explain the stability analysis for finite slopes using Bishop's method.	CO2	8 Marks
	b)	An embankment constructed with an inclination of 35^0 and its height is 15m. The angle of shearing resistance is 15^0, cohesion intercept is 20 kN/m^2 and unit weight of soil is 18.0 kN/m^3. If the embankment was fully submerged, then find the factor of safety with respect to cohesion. Use Taylors stability number. For $i = 35^0$ and $\phi = 15^0$, take Sn = 0.06.	CO2	6 Marks

UNIT-IV

7.	a)	Discuss about the effect of water table on bearing capacities of shallow foundation.	CO1	8 Marks
	b)	Determine the allowable bearing pressure of a shallow foundation of 2m width with its base at 1.5m depth. The water table is at a depth of 2m from ground surface. The corrected N value obtained from SPT test at depth of foundation is 25. Use Teng's formulae and assume allowable settlement as 40mm.	CO2	6 Marks

(OR)

8.	a)	What are the assumptions of Terzaghi's bearing capacity theory?	CO1	6 Marks
	b)	A square footing of size 3m x 3m rests on a c- ϕ soil having c = 12kN/m^2, ϕ= 30^o and γ = 18 kN/m^3. The base of the footing is at a depth of 2.5 m below ground surface. Calculate the safe bearing capacity of the soil for following conditions: i) When water table is at a depth of 3m from ground surface. ii) When water table is at ground surface. (For ϕ= 30^o, N_c = 37.2, N_q = 22.5 and N_γ = 19.7) Take F.S = 3.	CO2	8 Marks

UNIT-V

9.	a)	What is a pile foundation? What are the conditions where a pile foundation is more suitable than a shallow foundation?	CO1	8 Marks
	b)	Discuss in brief about various formulae used for determining capacity of driven piles.	CO1	6 Marks

(OR)

10.	a)	Explain the following rectifying methods of tilts and shifts of well foundation. i) Controlled dredging. ii) Pushing the well. iii) Water jetting.	CO1	6 Marks
	b)	What are the various types of caissons? Give out their advantages and disadvantages.	CO1	8 Marks

CODE No.: 16BT60102 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

HIGHWAY AND TRAFFIC ENGINEERING
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain briefly the following. i) IRC. ii) Central Road Fund.	CO1	6 Marks
	b)	Explain various factors controlling highway alignment with a neat sketch.	CO1	8 Marks

(OR)

2.	a)	What is super elevation? Derive an expression for super elevation with a neat sketch.	CO3	7 Marks
	b)	Define over taking sight distance. Derive an expression for over taking sight distance with a neat sketch.	CO3	7 Marks

UNIT-II

3.	a)	List the desirable properties of bitumen and mention various tests performed on bituminous materials.	CO2	7 Marks
	b)	Explain crushing test on aggregate with a neat sketch	CO2	7 Marks

(OR)

4.	a)	Differentiate between flexible and rigid pavement.	CO3	7 Marks
	b)	Write equations for load, temperature and frictional stresses in rigid pavement.	CO3	7 Marks

UNIT-III

5.	a)	List out elements involved in traffic operation. Discuss the primary functions of traffic engineering.	CO5	7 Marks
	b)	Explain various static vehicle characteristics affecting road design and traffic performance.	CO4	7 Marks

(OR)

6.	a)	A vehicle travelling with a speed of 45 kmph was stopped within 1.7 seconds after application of brakes. Find the average skid resistance.	CO4	6 Marks
	b)	Discuss fundamental diagrams of traffic flow.	CO6	8 Marks

UNIT-IV

7. a) Enlist method of traffic volume study and explain mechanical counters method with advantages. CO6 7 Marks

   b) Using the spot speed data given in the following table, determine: CO8 7 Marks

   i) Modal Speed. ii) Median Speed.

   iii) Speed limit for Traffic Regulations.

   iv) Speed to be used in geometric design.

Speed Range (kmph)	No. of Vehicles observed
21-25	2
26-30	6
31-35	18
36-40	25
41-45	19
46-50	16
51-55	17
56-60	12
61-65	7
66-70	4
71-75	3
76-80	1

(OR)

8. a) Enlist purposes of travel time and delay study. Also explain fixed delay and operational delay. CO7 7 Marks

   b) Define practical capacity. Briefly discuss various factor affecting the practical capacity of road CO7 7 Marks

UNIT-V

9. a) Explain collision and condition diagram. List preventive measure for road accidents. CO6 7 Marks

   b) Explain various methods of on-street parking with neat sketch. CO7 7 Marks

(OR)

10. a) Draw a neat sketch of rotary intersection. Show all design components and explain about them in brief. CO7 7 Marks

    b) List various traffic signs as per IRC and draw neat sketch of following signs. CO7 7 Marks

    i) No parking. ii) Hair pin Band. iii) Give way.

CODE No.: 16BT60103 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

STEEL STRUCTURES
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	Design a double cover plate butt joint using M24 bolts of product grade C and property class 5.6 to connect two flats of size 350mm x 16mm for maximum efficiency. Assume that one shear plane intercepts the threads of the bolts. The yield and ultimate tensile strengths of the flats are 250 MPa and 410 MPa, respectively.	CO3	14 Marks
	(OR)		
2.	Determine the size of end fillets to connect two plates with cross sections of 125 x 8mm and 125 x 12mm which are subjected to a tension of 100kN at working load. The ultimate strength of the plates, fu = 410 MPa.	CO2	14 Marks

UNIT-II

3.	Design a laterally unsupported beam for the following data: Effective span: 4 m; Maximum bending moment: 550 kNm; Maximum shear force: 200 kN; Steel of grade: Fe 410.	CO3	14 Marks
	(OR)		
4.	Design a simply supported beam of span 5m carrying a reinforced concrete floor capable of providing lateral restraint to the top compression flange. The uniform distributed load of 60kN/m. Assume Fe 410 grade steel.	CO3	14 Marks

UNIT-III

5.	Determine the tension capacity of 150 x 90 x 8mm angles in Fe 410 steel assuming: i) Connection through the longer leg by two rows of M20 bolts and ii) Connection through shorter leg by a single row of M24 bolts.	CO2	14 Marks
	(OR)		
6.	A double angle discontinuous strut consists of two ISA 75 x 75 x 6 connected back to back to both sides of the 10mm thick gusset plate with two bolts. The length of the strut is 4.5m. Calculate the safe load carrying capacity of the section.	CO3	14 Marks

UNIT-IV

7.	Design a batten system for a column of 10m long to carry a factored axial load of 1000kN. The column is restrained in position but not in direction at both ends. Assume that the two channels back to back.	CO4	14 Marks
	(OR)		

8.	Design a suitable slab base for a column section ISHB 200 at 365.9 N/m supporting an axial load of 400kN. The base plate is to rest on a concrete pedestal of M-20 grade.	CO2	14 Marks

UNIT-V

9.	As per IS 875 (Part 3), determine the basic wind pressure to be considered for a shed in the outskirts of Bangalore. Given data: Structure: General purpose with probable life of 50 years. Terrain category is I, Building Class B. Eye board height: 11 m. Topography: Plain area.	CO6	14 Marks

(OR)

10.	Explain the following terms as per IS 875 (Part 3):		
	i) Basic wind speed.	CO7	3 Marks
	ii) Design wind speed.	CO7	3 Marks
	iii) Risk coefficient.	CO7	3 Marks
	iv) Terrain, Height and structure size factor.	CO7	3 Marks
	v) Topography factor.	CO7	2 Marks

CODE No.: 16BT60104 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

FIRE ENGINEEERING
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.		Write a detailed note on shock waves, auto ignition and boiling liquid expanding vapour explosion.	CO1	14 Marks
		(OR)		
2.	a)	Describe the theory of combustion and explosion.	CO1	8 Marks
	b)	Discuss briefly about toxicity of products of combustion.	CO1	6 Marks
		UNIT-II		
3.		Discuss in detail about types of fire extinguishers, fire stoppers, alarm and detection systems.	CO2	14 Marks
		(OR)		
4.	a)	Explain the concept of fire triangle.	CO1	6 Marks
	b)	Explain the various classes of fires.	CO2	8 Marks
		UNIT-III		
5.	a)	Explain about active and passive fire protection systems.	CO2	7 Marks
	b)	Write a note on portable extinguishers.	CO5	7 Marks
		(OR)		
6.		Explain the selection criteria, reliability, maintenance and evaluation of various fire protection systems.	CO3	14 Marks
		UNIT-IV		
7.		Discuss the significance of structural fire protection and structural integrity.	CO2	14 Marks
		(OR)		
8.		Explain the fire safety requirements for high rise buildings.	CO7	14 Marks
		UNIT-V		
9.		Explain the explosion relief of large enclosures, explosion venting and inert gases.	CO9	14 Marks
		(OR)		
10.		Discuss in detail about explosion protection, flame arresters, isolation and venting.	CO10	14 Marks

CODE No.: 16BT60106 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

ADVANCED STRUCTURAL ANALYSIS

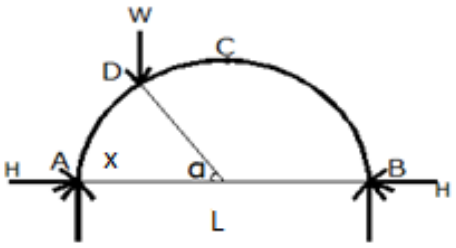
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

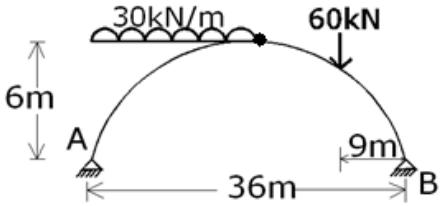
UNIT-I

1. a) Explain in detail. CO1 7 Marks
   i) Effects of yielding of supports in arches. CO2
   ii) Rib shortening and temperature changes in the arches.
   b) Find the horizontal thrust of a two hinged arch subjected to concentrated load as shown below. CO4 7 Marks



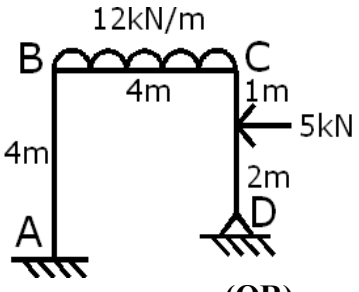
(OR)

2. A three hinged parabolic arch is shown in figure, determine the bending moment, normal thrust and radial shear at quarter span and draw bending moment. CO2 CO4 14 Marks



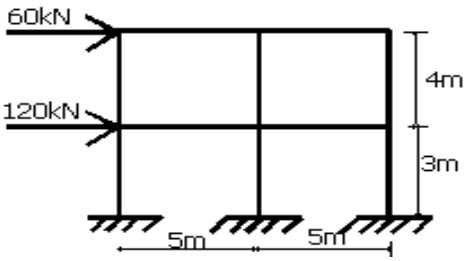
UNIT-II

3. Analyse the below portal frame by moment distribution method. CO4 14 Marks



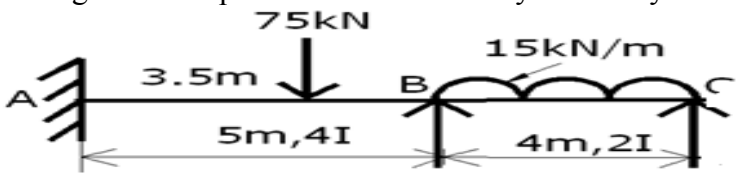
(OR)

4. Analyze the following portal frame by portal method. Draw BMD CO4 14 Marks



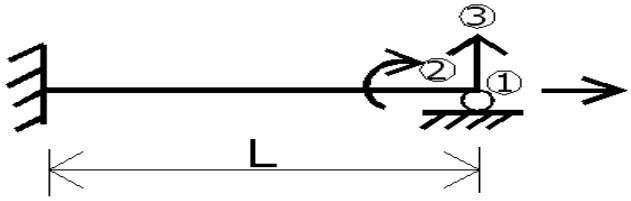
UNIT-III

5. Analyze the given two span continuous beam by flexibility method. CO3 14 Marks



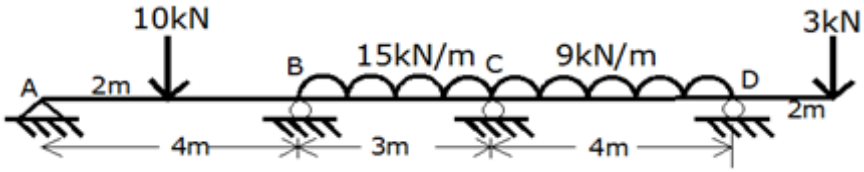
(OR)

6. For the simply supported beam shown below, develop the flexibility matrix with reference to the coordinates as specified. CO2 14 Marks



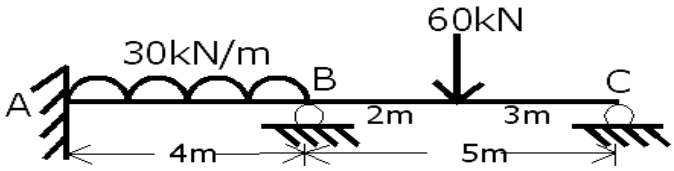
UNIT-IV

7. Analyse the given continuous beam by stiffness matrix method and sketch BMD. CO2 14 Marks



(OR)

8. Calculate the support moments for the given continuous beam by support B sinks by 2.5mm. Draw BMD. Take E=200kN/mm^2, I=3.5x10^7 mm^4 CO3 14 Marks



UNIT-V

9. A curved beam is in the form of a full continuous circle in plan with a radius of 3m and is supported continuously on five supports. The beam carries a uniformly distributed load of 30kN/m length, inclusive of its own weight. Determine the bending moment, twisting moment and shear force at salient locations. Also plot the B.M., T.M. and S.F. diagrams for one span. CO2 14 Marks

(OR)

10. A semi-circular beam is simply supported on three equally spaced columns. Show that the maximum bending moment and maximum twisting moment are equal to 0.429wR^2 and 0.1045wR^2 respectively. CO2 14 Marks

CODE No.: 16BT60109 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

GROUNDWATER DEVELOPMENT AND MANAGEMENT
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define Darcy law. Derive the expression for the Darcy law. List the different assumptions and discuss it validity.	CO1	8 Marks
	b)	Briefly explain Aquifer, Aquiclude, Aquitard and Aquifuge.	CO1	6 Marks
		(OR)		
2.	a)	Discuss the terms specific yield, specific retention, porosity and their relationship.	CO1	8 Marks
	b)	With the help of neat sketch, explain in detail the vertical distribution of ground water.	CO1	6 Marks

UNIT-II

3.	a)	Derive the expression for discharge "Q" through a well, fully penetrating a confined aquifer or artesian aquifer.	CO2	8 Marks
	b)	An unconfined aquifer has a thickness of 40m. A fully penetrating 20cm diameter well in this aquifer, is used to pumped water at a rate of 35 lit/sec. the drawdown measured in two observation wells located at distances of 20m and 120m from the well are 7.0m and 1.0m respectively. Determine the average hydraulic conductivity of the aquifer.	CO2	6 Marks
		(OR)		
4.	a)	Derive an expression for discharge from a well fully penetrating a unconfined aquifer under steady state flow. Assume if any data required.	CO2	7 Marks
	b)	An unconfined aquifer has a thickness of 30m. A fully penetrating 20cm diameter well in this aquifer is pumped at a rate of 35 lit/sec. The drawdown measured in two observation wells located at distances of 10m and 100m from the well are 7.5m and 0.5m respectively. Determine the average hydraulic conductivity of the aquifer and transmissibility of the unconfined aquifer. Assume if any data required.	CO2	7 Marks

UNIT-III

5.	a)	Briefly discuss saline water intrusion. List the different reason for the saline water intrusion.	CO4	8 Marks
	b)	List the different disadvantages of saline water intrusion in aquifers.	CO4	6 Marks
		(OR)		
6.	a)	Explain Glover method.	CO4	5 Marks
	b)	A well screen 1m in length is located 15m below the groundwater table in an unconfined aquifer having permeability of 20 m/day. The fresh water and sea water interface exist at a depth of 36m below the water table depth. What is the maximum discharge that can be sustained from the well without causing the salt to intrude into the well?	CO6	9 Marks

UNIT-IV

7.		List and briefly explain different techniques used for ground water recharge methods in detail with neat sketches.	CO3	14 Marks

(OR)

8.	a)	List and explain the indirect techniques used of the ground water recharge.	CO3	7 Marks
	b)	Describe any one combined techniques of subsurface and surface used for recharge of ground water.	CO3	7 Marks

UNIT-V

9.		Briefly discuss geophysical logging and resistivity logging sub-surface methods of ground water investigation.	CO5	14 Marks

(OR)

10.	a)	Explain the principle of subsurface investigation using electrical resistivity methods for exploration of ground water.	CO5	8 Marks
	b)	Explain the basic principle of seismic refraction method.	CO5	6 Marks

CODE No.: 16BT60110 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

SOLID WASTE MANAGEMENT
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Explain physical and chemical characteristics of solid waste. CO1 7 Marks

   b) Using the data for a municipal solid waste sample provided below, find the average moisture content of the sample. Base your calculations on a100kg sample size. CO2 7 Marks

Component	Moisture content (%)	Weight (%)
Paper waste	5	29
Yard Waste	45	20
Food waste	70	16
Plastic	1	11
Wood	25	8
Glass	6	9
Metals	3	7

(OR)

2. Investigate the importance of role of NGOs and legislation in effective Solid Waste Management. CO2 14 Marks

UNIT-II

3. a) Discuss how the waste is collected, removed and transported. CO2 7 Marks

   b) Write the importance of color containers and materials used for storage containers. CO5 7 Marks

(OR)

4. How the recyclable materials are separate at source? Discuss briefly processing of solid waste at residential dwellings. CO2 14 Marks

UNIT-III

5. a) Investigate the important factors to be considered in preparation of collection routes. CO4 7 Marks

   b) Explain the different options available for collection of waste under Indian condition. CO2 7 Marks

(OR)

6. Explain in detail about selection of location, operation and maintenance of transfer station. CO9 14 Marks

UNIT-IV

7.	a)	Write a detailed note on "composting".	CO5	7 Marks
	b)	What is incineration? Explain the advantages and disadvantages of incineration of refuse.	CO2	7 Marks

(OR)

8.		Explain in detail about any two techniques used for processing of solid waste.	CO5	14 Marks

UNIT-V

9.	a)	Write a brief note on management rules in Bio-medical waste.	CO6	7 Marks
	b)	What is pyrolysis and explain process with neat sketch.	CO5	7 Marks

(OR)

10.	a)	What are the factors that are considered for selecting a land filling site in terms of environmental sustainability?	CO7	7 Marks
	b)	Write the adverse effects of a land filling leachate and list approximate Control measures.	CO5	7 Marks

CODE No.: 16BT60118 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

RURAL TECHNOLOGY

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Write about Rural Indian life and Indian farmer.	CO2	7 Marks
	b)	Explain how the technology plays a vital role in improving rural infrastructure.	CO1	7 Marks
		(OR)		
2.	a)	Describe how poverty eradication is carried out in rural areas and also describe about rural business hubs.	CO4	7 Marks
	b)	What is the role of CAPART, NABARD, CSIR and NIF in issues of technology transfer?	CO4	7 Marks

UNIT-II

3.	a)	Enumerate various sources of non-conventional energy and describe them with merits and de-merits.	CO4	7 Marks
	b)	Write about assessment and production of biomass products and their utilization.	CO2	7 Marks
		(OR)		
4.	a)	Explain how the rural areas will develop with solar energy.	CO4	7 Marks
	b)	Write the working principle involved in solar cooker.	CO4	7 Marks

UNIT-III

5.	a)	Explain how the food and agro based technologies will plays a vital role in the development of rural areas.	CO4	7 Marks
	b)	What are the building materials used for construction in rural areas and explain the construction technologies?	CO1	7 Marks
		(OR)		
6.	a)	What do you mean by tissue culture and nursery?	CO4	7 Marks
	b)	Write the procedure for processing of economic plants.	CO4	7 Marks

UNIT-IV

7.	a)	The village which is located in a drought prone area, suggest how rain water harvesting is useful in such areas.	CO4	7 Marks
	b)	How can you educate the village farmers in view of Bio-fertilizers with their importance and uses?	CO4	7 Marks
		(OR)		
8.	a)	Write a note on drinking water, environment and sanitation.	CO4	7 Marks
	b)	Explain various employment generating technologies.	CO4	7 Marks

UNIT-V

9.	a)	Write about the role of Information Technology (IT) in rural areas.	CO3	7 Marks
	b)	Explain about Saansad Adarsh Gram Yojana (SAGY).	CO1	7 Marks
		(OR)		
10.	a)	Discuss the impact of IT in rural development.	CO3	7 Marks
	b)	Describe about village adoption schemes.	CO2	7 Marks

CODE No.: 16BT60201 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

POWER SEMICONDUCTOR DRIVES
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Derive the fundamental torque equation of an electrical drive.	CO1	8 Marks
	b)	A drive has the following parameters: T = 150 – 0.1 N, N-m, where N is the speed in r.p.m. Load torque Tl = 100, N-m, Initially the drive operating in steady-state. The characteristics of the load torque are changed to Tl = -100. Calculate initial and final equilibrium speeds.	CO1	6 Marks

(OR)

2.	a)	Explain Modes of operation of electrical drives.	CO2	7 Marks
	b)	Draw and explain the closed loop speed control schemes in multi motor drives.	CO1	7 Marks

UNIT-II

3.		A 230V, 960 r.p.m, 20A separately excited dc motor has armature resistance and inductance of 1.2Ω and 50mH respectively. Motor is controlled by a single phase half controlled rectifier with source voltage of 230V, 50Hz. Identify the modes and calculate speeds for: (i) $\alpha = 60^0$ and torque =1000 N-m. (ii) $\alpha = 120^0$ and torque =1000 N-m.	CO3	14 Marks

(OR)

4.		Analyze speed torque relation and characteristics of separately excited DC motor fed by a 3-phase fully controlled converter. Draw the relevant waveforms.	CO2	14 Marks

UNIT-III

5.		Describe operation of chopper fed to separately excited DC motor under motoring and regenerative braking control with circuit and waveforms.	CO2	14 Marks

(OR)

6.		A 230 V, 1200 r.p.m, 15 A separately excited motor has an armature resistance of 1.2Ω. Motor is operated under dynamic braking with chopper control; braking resistance has a value of 20Ω. i) Calculate duty ratio of chopper for motor speed of 1000 r.p.m and braking torque equal to 1.5 times rated torque. ii) What will be the motor speed for duty ratio of 0.5 and motor torque equal to its rated torque.	CO4	14 Marks

UNIT-IV

7.	a)	With necessary block diagram, explain operation of variable frequency control of 3-phase Induction motor.	CO2	10 Marks
	b)	List out difference between CSI and VSI fed drives. Justify.	CO4	4 Marks

(OR)

8.		A 440 V, 50Hz, 970 r.p.m, 6 pole Y connected three phase wound rotor induction motor has following parameters referred to stator. Rs=0.1 Ω, Rr'=0.08 Ω, Xs=0.3 Ω, Xr'=0.4 Ω. Stator to rotor turns ratio is 2. Motor speed is controlled by Static Scherbius Drive. Drive is designed for a speed range of 25% below the synchronous speed. Max value of firing angle is 165^{o}. DC link inductor resistance is 0.01 Ω. Calculate: i) Transformer turns ratio. ii) Torque for a speed of 780 r.p.m at $\alpha=140^{o}$ iii) Firing angle for half the rated motor torque and speed of 800 r.p.m.	CO5	14 Marks

UNIT-V

9.	a)	Analyze the operation of self-controlled synchronous motor with Voltage source inverter.	CO2	10 Marks
	b)	Name the different modes employed to achieve variable frequency control in synchronous motors.	CO1	4 Marks

(OR)

10.	a)	When can a synchronous motor be load commutated?	CO1	4 Marks
	b)	List out and explain the drive circuits for stepper motors, depending on load torque capability how drive circuit selected.	CO5	10 Marks

CODE No.: 16BT60202 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

POWER SYSTEM ANALYSIS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Form Y bus for the network by direct inspection method: CO4 7 Marks

Element	5-1	5-2	1-2	2-3	1-4	3-6	4-6
Positive sequence reactance	0.04	0.05	0.04	0.03	0.02	0.07	0.10

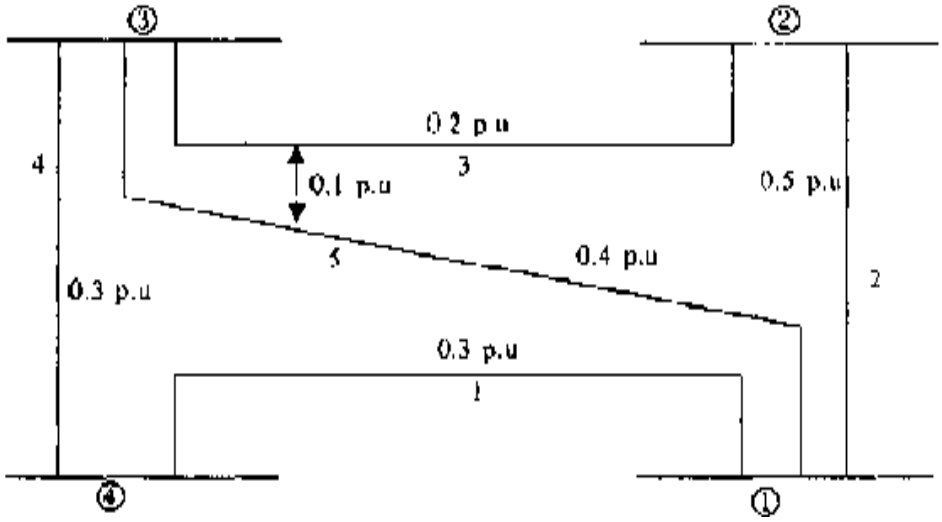
b) Define the per unit value of a quantity. How will you change the base impedance from one set of base values to another set? CO1 7 Marks

(OR)

2. a) Describe the per phase generator model with required diagrams. CO2 7 Marks
b) With neat diagrams, explain the transformer model used for per phase analysis. CO2 7 Marks

UNIT-II

3. a) Illustrate the modifications necessary in the Z_{BUS} when a mutually coupled element is removed. CO5 7 Marks
b) Using the building algorithm construct Z_{BUS} for the system shown in figure. Choose 4 as reference bus. CO4 7 Marks



(OR)

4. a) Explain the procedure for modification of Z_{BUS} when a line is added, which has no mutual reactance. CO5 7 Marks
b) Form bus impedance matrix for the data given below. CO3 7 Marks

Element number	Bus code From bus – To bus	Self-impedance
1	2-3	0.6 p.u.
2	1-3	0.5 p.u.
3	1-2	0.4 p.u.

UNIT-III

5.		Explain the step by step computational procedure for the Gauss-Seidel method of load flow studies when the system contains all types of buses.	CO5	14 Marks

(OR)

6.	a)	What are the assumptions made in reducing Newton Raphson method to decoupled method for power flow solution?	CO1	7 Marks
	b)	Derive the static load flow equations of n-Bus system.	CO2	7 Marks

UNIT-IV

7.	a)	With the help of a detailed flow chart, explain how a symmetrical fault can be analysed using Z_{BUS}.	CO2	7 Marks
	b)	What are the various types of faults? Discuss their frequency of occurrence and severity. Find the fault current when an L-L-G fault occurs at the terminals of an unloaded generator.	CO3	7 Marks

(OR)

8.	a)	Illustrate the procedure for making short circuit studies of a large power system.	CO1	7 Marks
	b)	A 3-phase, 25 MVA, 11 KV alternator has internal reactance of 6%. Find the external reactance per phase to be connected in series with the alternator so that steady state short circuit current does not exceed six times the full load current.	CO3	7 Marks

UNIT-V

9.	a)	Discuss the various factors affecting the transient stability of the system.	CO1	7 Marks
	b)	Explain the equal area criterion. How it is useful for predicting system stability?	CO4	7 Marks

(OR)

10.	a)	Write short notes on assumptions made in deducing equal area criterion.	CO1	7 Marks
	b)	Define steady state stability and explain the methods for improving steady state stability.	CO5	7 Marks

CODE No.: 16BT60203 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

DESIGN AND ESTIMATION OF ELECTRICAL SYSTEMS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. Estimate the quantity of material required along the cost for conduit (PVC) wiring in one room of dimensions 20 x 8 x 5 meters. The following are to be points to be fitted and draw the layout of the given system. CO3, CO4, CO7 — 14 Marks
   i) Lights points – 8 Nos x 20W ii) Fan Points – 6 Nos x 60W
   iii) Plug Points – 3 point socket type – 3 x 100W
   iv) AC - 2 x 1.5 Ton (appox. rating assume 2kW).

(OR)

2. a) Write the general rules to be considered for wiring systems and also explain the estimation of Conductor size and selection cables for a particular load (Assume necessary data for explanation) CO1, CO3 — 7 Marks
   b) Explain tin brief different types of domestic and commercial wiring systems. List out all merits and demerits. CO1, CO3 — 7 Marks

UNIT-II

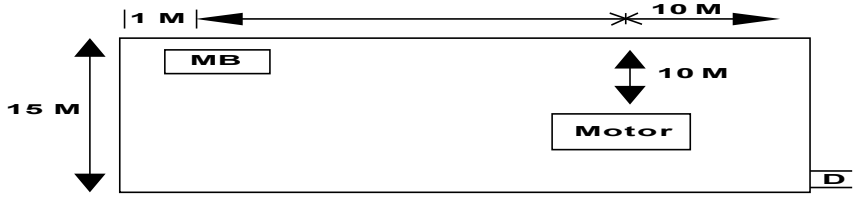
3. a) An overhead 3-phase, 415V distributor to be laid along route 450m long. The end supports are terminal poles with 60m span in between. Prepare list for laying distributor. Consider the following data: CO1, CO3 — 8 Marks
   Conductor: ACSR 6/1 x 2.11mm for phase, neutral and street light Earth wire, GI wire –6 SWG , 1.92kg /10m weight. L.T cable: 4 core, 60mm^2, 1100V grade. Distance of first terminal pole from the substation is 10m.
   b) Discuss the methods of installation of service line and overhead line. CO3 — 6 Marks

(OR)

4. a) Find the material required for 1 phase overhead service line of a house located 10 mts away from the pole, with following loads: CO1, CO3 — 7 Marks
   i) Lighting and other loads = 2.5 kW,
   ii) AC Load: 10kW (Assume safety factor = 1.66)
   b) Explain the procedure for estimation of H.T lines for distribution line. CO1, CO3 — 7 Marks

UNIT-III

5. a) A 15HP 415V 3-Phase, 50Kz squirrel cage induction motor is to be installed in a pump house, of dimensions given in below Fig. Show its wiring diagram layout and estimate the quantity of materials required and its cost. CO3. CO4 — 8 Marks



   b) Describe the selection of switch gears for 33kV/11kV substation and draw substation lay out. CO2, CO3, CO6 — 6 Marks

(OR)

6.	a)	Explain in brief selection of distribution architecture.	CO2, CO3	6 Marks
	b)	Explain the how you will calculate full load current and decide size of the conductor size for the following motor. i) DC Motor. ii) 3-phase induction motor (Assumerating of motor for explanation for both the cases).	CO3, CO4	8 Marks

UNIT-IV

7.	a)	A small area of 10 meters in diameter is to be illuminated by a lamp suspended at a height of 4.5 meters over the center of area. A lamp having an efficacy of 30 lumens per watt is fitted with a reflector which directs the light output only over the surface to be illuminated. If the utilization coefficient is 0.66 and illumination 850 lux, determine the wattage of the lamp.	CO1	7 Marks
	b)	Discuss inverse square law and cosine law of Illumination.	CO1	7 Marks

(OR)

8.	a)	A hall of dimensions 40m x 15m x 5m is to be provided with a general illumination of 150 lumens/m^2. Taking a coefficient of utilization of 0.6 and depreciation factor of 1.42, determine the number of fluorescent tubes required, their spacing, mounting height and total wattage. Taking luminous efficiency of florescent tube as 40 lumens/watt for 40W tube.	CO1	7 Marks
	b)	The candle power of a lamp is 120. A plane surface is placed at a distance of 2.5m from this lamp. Calculate the illumination on the surface when it: i) normal. ii) inclined to 45^0.	CO1	7 Marks

UNIT-V

9.	a)	A piece of an insulating material is to be heated by dielectric heating. The size of the piece is 10m x 10 cm x 3cm. A frequency of 20 MHz is used and the power absorbed is 450W. If the material has a relative permittivity of 6 and a power factor of 0.05, calculated the voltage necessary for heating and current that follows in the material.	CO1, CO4, CO5, CO7	8 Marks
	b)	Explain the classifications of resistance welding. What are its advantages and disadvantages?	CO1, CO5	6 Marks

(OR)

10.	a)	A 50 kW single phase, 220V resistance oven employees circular nichrome wire for its heating element. If the wire temperature is not to exceed 1500^0C and the temperature of the charge is to be 450^0C, calculate the size and length of wire required. Assume e = 0.95 and radiation efficiency K = 0.65. What would be the temperature of wire when the charge is cold (25^0C)?	CO1, CO4, CO7	8 Marks
	b)	Explain the reasons for considering the electric heating as superior compared to other types of heating.	CO1	6 Marks

CODE No.: 16BT60204 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

DIGITAL SIGNAL PROCESSING FOR ELECTRICAL ENGINEERS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Two signals $x(n)$ and $h(n)$ given as, $x(n) = \{1,2,3,4,5\}$ and $h(n)=\{5,4,3,2,1\}$. CO1 6 Marks

Determine the following signals.

i) $p(n)= 2 + x(n)$

ii) $q(n) = x(n)h(n)$

iii) $r(n) = 1.5\ h(n)$

b) Solve the linear difference equation CO1 8 Marks

$y(n) - 0.5\ y(n-1) + 0.06\ y(n-2) = 2\ (0.1)^n$ with $y(-1) = 1$ and $y(-2) = 0$.

(OR)

2. a) Find the z-transform of the signal $x(n) = n(0.1)^n\ u(n)$. CO1 7 Marks

b) Compare analog signal processing and digital signal processing. CO1 7 Marks

UNIT-II

3. a) Consider a finite length sequence $x(n) = \delta(n) + 2\ \delta(n-5)$. Find the 10-point DFT. CO2, CO4 4 Marks

b) State and prove the circular frequency shifting and conjugate symmetry properties of DFT. CO2 10 Marks

(OR)

4. a) Discuss the properties of Radix-2 decimation in time algorithm. Find 8- point DFT of sequence. $x(n)=1,\ 0 \le n \le 7$. Using DIT-FFT algorithm. CO2, CO4 10 Marks

b) Find the circular convolution of CO4 4 Marks

$x(n) = \{1,3,\underset{\uparrow}{4},-2,-5\}$ and $h(n) = \{1,\underset{\uparrow}{2},-2,-5\}$.

UNIT-III

5. a) Obtain direct form-I realization of the LTI system governed by the difference equation. CO3 8 Marks

$Y(n) = 1.5y(n-1) - 0.6\ y(n-2) - 0.2y(n-3) + x(n) - 1.5x(n-1)$.

b) Compare analog and digital filters. CO1 6 Marks

(OR)

6. a) Design an IIR low-pass Butterworth filter using bilinear transformation for the following speciation's. CO3 9 Marks

$$passband: \quad 0.8 \le \left|H(e^{j\omega})\right| \le 1, \ \ |\omega| \le 0.2\pi$$

$$stopband: \quad \left|H(e^{j\omega})\right| \le 0.2, \ \ 0.6\pi \le |\omega| \le \pi$$

b) What is Warping Effect? What is its effect on magnitude and phase response? CO3 5 Marks

UNIT-IV

7.		Design an ideal differentiator with frequency response $H(e^{j\omega}) = j\omega$, $-\pi \leq \omega \leq \pi$ using Hamming window for N=8 and also plot the magnitude response.	CO3	14 Marks

(OR)

8.		Design an ideal FIR LPF of length N=11 with cutoff frequency of 1KHz and sampling frequency of 4KHz using Fourier series method. Find the non causal FIR filter impulse response and system function. Moreover find the causal FIR filter system function and frequency response.	CO3	14 Marks

UNIT-V

9.	a)	How the memory is allocated in LF2407 DSP controller? Also give the types of physical memory.	CO5	8 Marks
	b)	List the components that are included in peripheral set of LF2407.	CO5	6 Marks

(OR)

10.		Explain the control of stepper motor using LF2407 DSP controller in full step and half step modes.	CO5, CO6	14 Marks

CODE No.: 16BT60205 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

ELECTRICAL MACHINE DESIGN

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Illustrate the Faraday's Law of electro-magnetic induction and Justify the "Change in flux linkages can be caused in three ways".	CO1	7 Marks
	b)	What are the major considerations accounted for the good design of electrical machines?	CO1	7 Marks
		(OR)		
2.	a)	Discuss the design factors effecting temperature rise in electrical machines during operation.	CO1	7 Marks
	b)	Calculate the specific electric and magnetic loading of 100HP, 300V, 3-Phase, 50Hz, 8-pole, star connected, flame proof induction motor having stator core length of 0.5m and stator bore of 0.66m. Turns / phase are 286. Assume full load efficiency as 0.938 and pf as 0.86.	CO2	7 Marks

UNIT-II

3.	a)	Explain the procedure of designing a shunt field coil of DC machine.	CO1	7 Marks
	b)	Determine the main dimensions, number of poles and length of air gap of a 600kW, 500V, 900 r.p.m DC generator. Assume average gap density as 0.6 Wb/m² and ampare conductors per meter as 35000. The ratio of pole arc to pole pitch is 0.75 and the efficiency as 91%. The design limitations are: Peripheral speed not to exceed 40 m/sec Armature mmf/pole not to exceed 7500 The mmf required for the air gap is 50% of armature mmf. Kg=1.15.	CO3	7 Marks
		(OR)		
4.	a)	i) Prove that in a DC motor torque is proportional to the volume of active material used. ii) "Insulation decides the rating of the machines" - justify the statement.	CO2	7 Marks
	b)	Show that the output of a DC generator with a single coil is given by ((0.03E'V.qA) / (P.N)) kW. where E' is the average voltage between adjacent commutator segments, V is the peripheral velocity in meters/sec, q is the specific electric loading in ac/motor, P is the number of poles and N is the speed in rpm.	CO2	7 Marks

UNIT-III

5.	a)	Derive an expression for the leakage reactance of a transformer with primary and secondary cylindrical coils of equal length.	CO1	7 Marks
	b)	Calculate the approximate overall dimensions for a 200 kVA, 6600/440V, 50Hz, 3-Phase core type transformer. The following data may be assumed: EMF per turn = 10V, Maximum flux density = 1.3 Wb/m². Current density = 2.5 A/mm². Window space factor = 0.3, overall height - overall width. Stacking factor = 0.9. Use a three stepped core. For a three stepped core, take a = 0.9d, Ai = 0.6d², with usual notations.	CO5	7 Marks

(OR)

6.	a)	Obtain an expression for the no load current of a single and three phase transformer.	CO4	9 Marks
	b)	Write an elaborated note on cooling of transformers.	CO4	5 Marks

UNIT-IV

7.	a)	Derive the power and voltage output equation of a three phase induction motor.	CO1	6 Marks
	b)	A 15kW, 400V, 3-Phase, 50Hz, 6-pole induction motor has a diameter of 30cm and core length of 12cm. The number of stator slots is 72 with 20 conductors per slot. The stator is delta connected. Calculate the magnetising current per phase if the length of the air gap is 0.55 mm. Assume gap contraction factor as 1.2. Assume, mmf required for the iron parts is 35% of the air mmf coil span = 11 slots.	CO3	8 Marks

(OR)

8.	a)	Explain the phenomenon of Cogging and Crawling of a 3-phase squirrel cage induction motor. What are the rules used to avoid cogging and crawling on the torque speed characteristic of the motor?	CO5	7 Marks
	b)	A 90kW, 500V, 50Hz, 3-phase, 8-pole induction motor has a stator connected stator winding kept in 63 slots with 6 conductors per slot. If the slip ring voltage on open circuit is to be 400V, find a suitable rotor winding stating: i) Number of slots. ii) Number of conductors per slot. iii) Coil span. iv) Slipping voltage on open circuit. v) Full load current per phase in rotor. Assume efficiency = 0.9, Power factor = 0.86.	CO5	7 Marks

UNIT-V

9.	a)	Define short circuit ratio of a synchronous machine. What are its effects on the machine performance?	CO1	7 Marks
	b)	Determine the main dimensions for a 10kVA, 3-phase, 400/230V, star connected 1500 r.p.m, 50Hz, alternator. Assume B_{avg} = 0.45T, q = 22000 ac/m, winding factor = 0.96. Ratio of core length to pole pitch = 1. Also determine the number of slots and conductors per slot.	CO2	7 Marks

(OR)

10.	a)	Derive the output equation of a synchronous machine and mention the salient features	CO1	7 Marks
	b)	The field coils of a salient pole alternator are wound with a single layer winding of bare copper strip 30mm deep, with separating insulation of 0.15mm thick. Determine suitable winding length, number of turns and thickness of conductor to develop an mmf of 12000 amp turns with a potential difference of 5V per coil and with a loss of 1200 Wb/m^2 of total coil surface. The mean length of turn is 1.2m. The resistivity of copper is 0.021Ω/m and mm^2.	CO2	7 Marks

CODE No.: 16BT60206 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

HVDC TRANSMISSION

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Write a short note about the different types of DC links with neat sketches.	CO1	8 Marks
	b)	Write a brief summary of technical advantages of DC over AC transmission.	CO6	6 Marks
		(OR)		
2.	a)	Classify the inherent problems associated with HVDC transmission.	CO2	6 Marks
	b)	Illustrate the applications of HVDC transmission system in detail.	CO2	8 Marks
		UNIT-II		
3.		Draw the schematic diagram of a 6-pulse Gratez's circuit and explain its operation with overlap angle less than 60^0 and represent relevant voltage and current waveforms.	CO2	14 Marks
		(OR)		
4.		Analyze the converter bridge characteristics both in rectifier and inverter modes of operation.	CO5	14 Marks
		UNIT-III		
5.		Explain about the two basic firing schemes in HVDC system and list out the drawbacks of EPC scheme.	CO5	14 Marks
		(OR)		
6.		Draw the diagram of basic power controller and explain about power flow controller in detail.	CO2	14 Marks
		UNIT-IV		
7.	a)	What are non-characteristic harmonics? Explain the effect of pulse number on harmonics.	CO1	7 Marks
	b)	Briefly explain about the design criteria of AC filters.	CO3	7 Marks
		(OR)		
8.	a)	Mention different types of filters? Explain about design of a high pass filter with the relevant equations.	CO3	10 Marks
	b)	Explain about protection of filters.	CO3	4 Marks
		UNIT-V		
9.		Write down the causes of over voltages in a converter station explain each cause in detail.	CO2	14 Marks
		(OR)		
10.	a)	Explain about the phenomena of protection against over currents in detail.	CO1	8 Marks
	b)	Write a short note about arrangement a DC breaker with diagram.	CO1	6 Marks

CODE No.: 16BT60207 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

ADVANCED CONTROL SYSTEMS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. What is lag compensator? Explain the procedure for the design of lag compensator using root locus technique. CO3 14 Marks

(OR)

2. a) What is PI controller? What are its effects on system performance? CO1 4 Marks

   b) A unity feedback system has an open loop transfer function, $G(s) = \frac{50}{(s+3)(s+1)}$. Design PI controller so that the phase margin of the system is 35° at a frequency of 1.2 rad/sec. CO3 10 Marks

UNIT-II

3. Describe the concept of controllability and observability. Explain any two testing methods to check controllability and observability of a system. CO2 14 Marks

(OR)

4. a) Describe the principle of duality. CO1 4 Marks

   b) Convert the following system matrix to canonical form. CO1 10 Marks

$$A = \begin{bmatrix} 4 & 1 & -2 \\ 1 & 0 & 2 \\ 1 & -1 & 3 \end{bmatrix}$$

UNIT-III

5. Derive the expression for describing function of backlash non-linearity. CO2 14 Marks

(OR)

6. A linear second-order servo is described by the equation CO2 14 Marks

$$\ddot{e} + 3\xi_n \dot{e} + 2_n^2 e = 0; \text{ where } \boldsymbol{\xi = 0.5}; \boldsymbol{n = 1}; \boldsymbol{e(0) = 1}\ \dot{e}(0) = 0$$

Determine the singular points. Draw the phase trajectory using the method of isoclines.

UNIT-IV

7. a) Discuss in detail the direct method of Lyapunov for linear continuous time autonomous system. CO2 7 Marks

   b) Test the stability of the system described by CO4 7 Marks

$$\dot{x}_1 = -2x_1 + 5x_1^2 x_2, \qquad \dot{x}_2 = -3x_2$$

Determine the region of asymptotic stability using Krasovskii's method.

(OR)

8. Describe any two methods of generating Lyapunov functions. CO5 14 Marks

UNIT-V

9.	Explain necessary and sufficient conditions for the design of state feedback control through pole placement.	CO4	14 Marks

(OR)

10.	Consider the closed loop poles at $-1.5 \pm j4$, -5.5, design a state feedback controller, the closed loop transfer function of a plant is $\frac{Y(s)}{U(s)} = \frac{7}{S^2 + 2S^2 + 5S + 9}$ with the help of state feedback control $u = -kx$, it is desired to place the closed loop poles at $-1 \pm j3.5$ and -4. Calculate the necessary state feedback gain matrix 'K'.	CO4	14 Marks

CODE No.: 16BT60210 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

SPECIAL ELECTRICAL MACHINES
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain in detail the multi stack construction of Stepper Motor.	CO1	7 Marks
	b)	Explain the modes of excitation of Stepper Motor with neat diagram.	CO1	7 Marks
		(OR)		
2.	a)	Describe the principle of operation of Hybrid Stepper Motor.	CO1	7 Marks
	b)	Explain briefly a closed–loop operation system using a Microprocessor for a hybrid Stepper Motor	CO1	7 Marks

UNIT-II

3.	a)	Explain with neat diagram, the microprocessor based control of Switched Reluctance Motor.	CO1	9 Marks
	b)	Derive the expression for static torque in Switched Reluctance Motor.	CO2	5 Marks
		(OR)		
4.	a)	Develop Switched Reluctance Motor using two converter topologies and draw relevant diagrams.	CO3	7 Marks
	b)	Discuss the torque speed characteristics of Switched Reluctance Motor in detail.	CO2	7 Marks

UNIT-III

5.	a)	Discuss in detail about the construction and working of Synchronous Reluctance Motor with neat diagrams.	CO1	7 Marks
	b)	Draw and discuss phasor diagram with Torque – Angle characteristics of Synchronous Reluctance Motor.	CO2	7 Marks
		(OR)		
6.	a)	Derive the expression for the torque equation of a Synchronous Reluctance Motor.	CO2	7 Marks
	b)	Describe in detail the speed – Torque characteristics of Synchronous Reluctance Motor.	CO2	7 Marks

UNIT-IV

7.	a)	Discuss in detail about magnetic circuit analysis of PMBLDC Motor on open circuit.	CO1	7 Marks
	b)	Write the principle of operation of PMBLDC Motor.	CO1	7 Marks
		(OR)		
8.	a)	What is the need of sensor less control? Explain in detail how sensor less control is implemented on BLDC Motor.	CO5	7 Marks
	b)	A BLPM Motor has a no load speed of 6000 r.p.m, when connected to a 120V DC supply. The armature resistance is 2Ω. Rotational and iron losses may be neglected. Determine the speed when the supply voltage is 60V and the torque is 0.5 N-M.	CO4	7 Marks

UNIT-V

9.	a)	Discuss the construction and working of a transverse flux linear Induction Motor.	CO1	7 Marks
	b)	For a Linear Induction Motor, the supply frequency is equal to 24Hz, Input power = 6.3kW, Stator Copper and Iron losses = 1.3kW, Velocity of the Motor = 2.5m/s, pole pitch = 0.6cm. Determine the gross mechanical power developed and trust developed.	CO4	7 Marks

(OR)

10.	a)	Discuss the construction and principle of operation of Linear Synchronous Motor with neat diagrams.	CO1	9 Marks
	b)	Discuss about applications of LSM in Transport System.	CO6	5 Marks

CODE No.: 16BT60241 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

ENERGY AUDIT AND CONSERVATION
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the need of energy auditing.	CO1	6 Marks
	b)	Write a brief notes on: i) Pie charts. ii) Sankey diagrams.	CO2	8 Marks
		(OR)		
2.	a)	Define: i) Energy Index. ii) Cost index.	CO2	8 Marks
	b)	Describe the procedure for building audit.	CO8	6 Marks

UNIT-II

3.		Explain the roles and responsibilities of energy managers in industries.	CO9	14 Marks
		(OR)		
4.		List the various rules for efficient energy conservation.	CO8	14 Marks

UNIT-III

5.		What are the different procedures that can be followed for proper ventilation in buildings?	CO3	14 Marks
		(OR)		
6.		Describe the block diagram of solar passive architecture.	CO6	14 Marks

UNIT-IV

7.		Explain any four the energy audit instruments along with their importance while energy auditing.	CO2	14 Marks
		(OR)		
8.		What are the measures taken while design of energy efficient motors?	CO3	14 Marks

UNIT-V

9.		Demonstrate simple payback method with an example along with its merits and demerits.	CO10	14 Marks
		(OR)		
10.		A chemical company is considering investment to an energy project costing Rs.4,00,000/-. The estimated salvage value is zero. The tax rate is also zero. The company uses straight line depreciation and the proposed project has cash flows as follows.	CO10	14 Marks

Year	Cash Flows in INR
1	1,00,000/-
2	1,00,000/-
3	1,50,000/-
4	1,50,000/-
5	2,50,000/-

Determine (i) Payback period (ii) NPV at 15% interest

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

CAD / CAM
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	How the product cycle is revised with introduction of CAD/CAM?	CO1	7 Marks
	b)	How CAD/CAM systems are evaluated? Explain in detail by categorizing evaluation parameters during selection.	CO1	7 Marks
		(OR)		
2.	a)	What are the various memories used in a computer?	CO1	7 Marks
	b)	Explain how CAD helps to synthesize a product design and do engineering analysis for getting optimal design?	CO1	7 Marks

UNIT-II

3.	a)	Find the degree of Bezier curve controlled by three points (4, 2), (0, 0) and (2, 8). Also find the equation of the Bezier curve in parametric format with parameter "μ".	CO6	7 Marks
	b)	What is meant by a Geometric Entity? Explain the common entities used in Geometric Modeling.	CO6	7 Marks
		(OR)		
4.	a)	What are the various curve representation methods?	CO1	7 Marks
	b)	How the line and circle are parametrically represented as Analytic curves?	CO1	7 Marks

UNIT-III

5.	a)	What are the different types of contouring system in a CNC machine? Explain with neat sketches.	CO5	7 Marks
	b)	What is meant by the DNC? Discuss how it is different from CNC.	CO5	7 Marks
		(OR)		
6.	a)	Explain various types of input devices used in modern CNC controller for loading programs.	CO5	7 Marks
	b)	What is right hand rule in NC where it is used?	CO5	7 Marks

UNIT-IV

7.	a)	What is group technology? Discuss machine cell design in G.T.	CO3	7 Marks
	b)	Explain briefly the OPITZ CLASS system of codification.	CO3	7 Marks
		(OR)		
8.	a)	Differentiate between retrieval type and generative type CAPP systems. List out the merits and demerits of each type.	CO3	7 Marks
	b)	Explain about the production flow analysis.	CO3	7 Marks

UNIT-V

9.	a)	Write briefly on contact inspection method.	CO4	7 Marks
	b)	Explain the need for automated inspection strategies in manufacturing plant.	CO4	7 Marks
		(OR)		
10.	a)	Compare and contrast, contact and non-contact inspection techniques.	CO4	7 Marks
	b)	Define CAD/CAM and CIM. Give a brief note of their application in industries.	CO4	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

HEAT TRANSFER
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss elaborately on thermal conductivity of solids, liquids and gases.	CO1	7 Marks
	b)	Describe different types of boundary conditions applied to heat conduction problems.	CO1	7 Marks

(OR)

2.	a)	Derive 1D steady state heat conduction equation for a plane wall.	CO2	7 Marks
	b)	A brick wall (k = 0.7 W/m K) is 0.3 m thick. If the temperatures of inner and outer surfaces are maintained at 50^0C and 30^0C respectively, calculate the heat loss through one square meter area. Find also the temperature at an interior point of the wall 24cm distant from the outer wall.	CO5	7 Marks

UNIT-II

3.	a)	Derive an expression for heat dissipated by a fin of uniform cross-section with convective heat transfer at tip.	CO2	7 Marks
	b)	A copper cylinder 60cm diameter and 75cm long is initially at a uniform temperature of 25^0C. When the cylinder is exposed to hot flue gases, the surface temperature suddenly changes to 450^0C. Make calculations for the temperature at the centre of cylinder 3 minutes after the operation of change in surface temperature. Also calculate the time required for the temperature at the centre to attain 375^0C. Thermal diffusivity of copper is 1.12×10^{-4} m^2/s.	CO3	7 Marks

(OR)

4.	a)	A very long copper rod 20mm in diameter extends horizontally from a plane heated wall maintained at 100^0C. The surface of the rod is exposed to an air at 20^0C with heat transfer coefficient of 8.5 W/m^2 K. Workout the heat loss, if the thermal conductivity of copper is 400 W/m K. Further, considering it infinite, estimate the length of rod.	CO3	7 Marks
	b)	Explain the significance of Hesler and Grober charts.	CO1	7 Marks

UNIT-III

5.	a)	Explain the concept of boundary layer theory.	CO1	7 Marks
	b)	A 50cm long glass plate is hung vertically in air at 35^0C while the temperature is maintained at 85^0C. Calculate the boundary layer thickness at the leading edge of the plate. If a similar plate is placed in a wind tunnel and air is blown over it, at a velocity of 4m/s. Estimate the boundary layer thickness at its leading edge.	CO4	7 Marks

(OR)

6.	a)	Derive the Von-Karman integral equation.	CO2	7 Marks
	b)	A plate of length 750mm and width 250mm has been placed longitudinally in a stream of crude oil which flows with a velocity of 5m/s. If the oil has specific gravity 0.8 and kinematic viscosity 1 stoke, calculate: i) Boundary layer thickness at the middle of plate. ii) Shear stress at the middle of the plate. iii) Friction drag on one side of plate.	CO4	7 Marks

UNIT-IV

7.	a)	Derive LMTD equation for counter flow heat exchanger.	CO2	7 Marks
	b)	A heat exchanger is to be designed to condense 8 kg/s of an organic liquid (t_{sat} = 80^{0}C: h_{fg} = 600 kJ/kg) with cooling water available at 15^{0}C and at a flow rate of 60kg/s. The overall heat transfer coefficient is 480W/m^2 K. Calculate: i) The number of tubes required. The tubes are to be of 25mm outer diameter, 2mm thickness and 4.85m length, ii) The number of tube passes. The velocity of the cooling water is not to exceed 2m/s.	CO3	7 Marks

(OR)

8.	a)	Explain the regimes of Pool boiling curve.	CO1	7 Marks
	b)	Water at atmospheric pressure is to be boiled in polished copper pan. The diameter of the pan is 350mm and is kept at 115^{0}C. Calculate the following: i) Power of the burner. ii) Rate of evaporation in kg/hr. iii) Critical heat flux.	CO4	7 Marks

UNIT-V

9.	a)	Derive an expression $E_b = \pi I_b$.	CO2	7 Marks
	b)	Determine the radiant heat exchange per m^2 area for two infinite parallel plates held at temperature of 800K and 400K respectively. Take emissivity as 0.6 for the hot plate and 0.4 for the cold plate. What should be the emissivity of a polished aluminum shield placed between them, if heat flow is to be reduced to 40% of its original value? Calculate the equilibrium temperature of the shield.	CO4	7 Marks

(OR)

10.	a)	Discuss on shape factor algebra with simple sketches.	CO1	6 Marks
	b)	Estimate the solar radiation on a plate normal to the sun rays. Assume the sun to be a black body at a temperature of 5520^{0}C. The diameter of the sun is 1.39 x 10^{6}Km and its distance from the earth is 1.5 x 10^{8}km.	CO3	8 Marks

CODE No.: 16BT60303 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

NON-CONVENTIONAL ENERGY SOURCES
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the methods of direct energy conversion with examples.	CO1	6 Marks
	b)	Outline the various solar radiation measurement technologies in detail.	CO2	8 Marks
		(OR)		
2	a)	Define the terms: i) Altitude angle. ii) Incident angle. iii) Zenith angle. iv) Solar Azimuth angle. v) Latitude angle. vi) Declination angle.	CO1	6 Marks
	b)	What is the present status of development of solar energy in India?	CO2	8 Marks

UNIT-II

3	a)	What are the important performance indices of a solar collector? Explain them briefly.	CO2	8 Marks
	b)	Explain the working of a flat plate collector with their thermal analysis.	CO2	6 Marks
		(OR)		
4	a)	Classify various types of air collectors with suitable sketches.	CO3	8 Marks
	b)	Why orientation is needed in concentrating type collectors? Describe various method of sun tracking.	CO2	6 Marks

UNIT-III

5	a)	Discuss about the applications of solar thermal energy.	CO3	8 Marks
	b)	Explain the types of PV cells and I-V curve characteristics in brief.	CO2	6 Marks
		(OR)		
6	a)	Describe a passive space solar heating system.	CO3	8 Marks
	b)	Discuss about Thermionic power generation.	CO2	6 Marks

UNIT-IV

7	a)	Explain the working of horizontal axis wind turbine.	CO3	7 Marks
	b)	Discuss about the utilization bio-mass in IC engines.	CO5	7 Marks
		(OR)		
8	a)	Describe the main considerations in selecting a site for wind power plants.	CO3	7 Marks
	b)	With a neat diagram, discuss the biomass gasification methodology.	CO2	7 Marks

UNIT-V

9	a)	How is geothermal energy generated inside the earth crust? Explain the operational features of vapour dominated geo-energy system with a neat sketch.	CO4	7 Marks
	b)	What are the environmental impacts of geothermal energy?	CO5	7 Marks
		(OR)		
10		Explain with neat sketches the various methods of Tidal power generation. What are the limitations of each method?	CO5	14 Marks

CODE No.: 16BT60304 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

GAS TURBINES AND JET PROPULSION
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Describe with neat sketches the working of a simple constant pressure open cycle gas turbine and enumerate the various uses of gas turbine.	CO1	7 Marks
	b)	The gas turbine unit has a pressure ratio of 6:1 and maximum cycle temperature of 610ºC. The isentropic efficiencies of the compressor and turbine are 0.80 and 0.82 respectively. Calculate the power output in kilowatts when the air enters the compressor at 15ºC at the rate of 16 kg/s.	CO2	7 Marks
		(OR)		
2.		The pressure ratio of open cycle gas turbine power plant is 5.6. Air is taken at 30ºC and 1 bar. The compression is carried out in two stages with perfect inter-cooling in between. The maximum temperature of the cycle is limited to 700ºC. Assuming the isentropic efficiency of each compressor stage as 85% and that of turbine as 90%, determine the power developed and efficiency of the power plant, if the air-flow is 1.2 kg/s. The mass of fuel may be neglected, and it may be assumed that c_p= 1.02 kJ/kg K and γ = 1.41.	CO1, CO2	14 Marks

UNIT-II

3.	a)	Explain the working of Centrifugal compressor with the aid velocity diagrams	CO1, CO2	7 Marks
	b)	An axial flow compressor with an overall isentropic efficiency of 85% draws air at 20ºC and compresses it in the pressure ratio of 4:1. The mean blade speed and flow velocity are constant throughout the compressor. Assuming 50% reaction blading and taking blade velocity as 180m/s and work input factor as 0.82, calculate flow velocity and number of stages. Take α_1=12º and β_1=42º.	CO2	7 Marks
		(OR)		
4.	a)	Classify rotary compressors and explain the working of Roots blower.	CO1	7 Marks
	b)	A centrifugal compressor running at 1440 r.p.m, handles air at 101kPa and 20ºC and compresses it to a pressure of 6 bar isentropically. The inner and outer diameters of the impeller are 14cm and 28cm respectively. The width of the blade at the inlet is 2.5 cm. The blade angles are 16º and 40º at entry and exit. Calculate mass flow rate of air, degree of reaction and power input and width of blades at outlet.	CO2	7 Marks

UNIT-III

5.	a)	What are the requirements of Gas turbine combustion chamber? Explain the various forms of combustion.	CO3	7 Marks
	b)	Explain the performance and operating characteristics of combustion chamber.	CO4	7 Marks
		(OR)		
6.	a)	What are the various types of gas turbine combustion chambers?	CO3	7 Marks
	b)	Explain various factors affecting combustion chamber design.	CO4	7 Marks

UNIT-IV

7.	a)	Explain the working principle of Turbo-Jet with the aid of neat sketch and define the following terms related to jet propulsion. i) thrust. ii) thrust power. iii) propulsive efficiency. iv) thermal efficiency.	CO1, CO4	7 Marks
	b)	Explain the working of Ram jet and discuss the advantages and disadvantages.	CO4	7 Marks
		(OR)		
8.	a)	Explain the working of turboprop engine and turbofan engine.	CO1	7 Marks
	b)	Why is thrust augmentation necessary? What are the methods for thrust augmentation in a turbojet engine?	CO4	7 Marks

UNIT-V

9.	a)	Classify the rackets and discuss about various types of propellants.	CO1, CO5	7 Marks
	b)	Derive expression for optimum expansion ratio for rocket.	CO1, CO5	7 Marks
		(OR)		
10.	a)	Explain briefly the working principle of rocket and derive the expression for propulsion efficiency of a rocket in-terms of speed ratio.	CO1, CO5	7 Marks
	b)	State the difference between jet propulsion and rocket propulsion and discuss about the advantage of using nuclear thermal rocket for space propulsion.	CO4, CO5	7 Marks

CODE No.: 16BT60305 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August – 2021

HYDRAULICS AND PNEUMATICS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Elaborate hydraulic power systems advantage and applications.	CO1	7 Marks
	b)	What are the desirable properties of hydraulic fluids? Disuss any two of them in detail.	CO1	7 Marks
		(OR)		
2.	a)	A pump has a displacement volume of 90cm^3. It delivers 0.75m^3/s oil at 1000 r.p.m and 75bars. If the prime over input torque is 125 N-m, what is the overall efficiency of the pump? What is the theoretical torque required to operate the pump?	CO2	7 Marks
	b)	How the capacity of variable displacement vane pump is adjusted? Explain with a diagram.	CO2	7 Marks

UNIT-II

3.	a)	How to calculate frictional losses in common valve and fittings.	CO3	8 Marks
	b)	Draw fluid power symbols of any six different types of valves.	CO3	6 Marks
		(OR)		
4.	a)	Design a hydraulic circuit for operating shaping machine to achieve fast and slow movement of ram.	CO4	7 Marks
	b)	Explain the working of five way two position direction control valve.	CO3	7 Marks

UNIT-III

5.	a)	Draw the neat sketch of the pneumatic filter and explain its construction and working.	CO3	7 Marks
	b)	Describe various pneumatic actuators with neat sketches.	CO3	7 Marks
		(OR)		
6.	a)	Enumerate types of pressure control valves and explain any one valve with neat sketch.	CO4	7 Marks
	b)	Elaborate time delay and memory valves used in pneumatics.	CO4	7 Marks

UNIT-IV

7.	a)	What is cascade control? Explain with suitable example of circuit diagram.	CO5	7 Marks
	b)	Explain with neat block diagram an air pilot control circuit for a double acting cylinder.	CO5	7 Marks
		(OR)		
8.	a)	Explain with a circuit diagram how is the control of an air motor is achieved. A flow control valve used to adjust the speed of the motor.	CO5	7 Marks
	b)	Discuss motion and control diagrams.	CO5	7 Marks

UNIT-V

9.		Develop an electro pneumatic circuit for the following sequence A+B+A-B- where A and B stand for cylinder (+) indicates extension and (-) indicates retraction of cylinders	CO6	14 Marks

(OR)

10.	a)	Describe different logic gates used in pneumatic circuits.	CO5	7 Marks
	b)	Explain pilot assisted solenoid control of directional control valves.	CO5	7 Marks

CODE No.: 16BT60307 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August – 2021

SUPPLY CHAIN MANAGEMENT
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Discuss the goal of Supply Chain Management and explain the impact of Supply Chain decisions on the success of a firm.	CO1	14 Marks

(OR)

2.		Give an example of a Supply Chain of your choice that has evolved over a period of time.	CO1	14 Marks

UNIT-II

3.	a)	Explicate the difference between FIFO and LIFO.	CO2	7 Marks
	b)	Discuss five costs associated with Inventories.	CO2	7 Marks

(OR)

4.	a)	Name and describe the categories of Inventory-Carrying costs.	CO2	7 Marks
	b)	Explain the three main approaches used in Warehousing.	CO2	7 Marks

UNIT-III

5.		Relate how Bullwhip effect leads to lack of coordination in a Supply Chain.	CO3	14 Marks

(OR)

6.		Examine the role of Information Technology in the supply chain of an Automobile industry. Explicate with a practical example.	CO3	14 Marks

UNIT-IV

7.		Differentiate between Distribution Channel and Transaction Channel in Supply Chain Transportation.	CO4	14 Marks

(OR)

8.		Explicate the objectives of a Physical Distribution System.	CO4	14 Marks

UNIT-V

9.		Determine the Inventory and Flow of Materials in Supply Chain Management using Flow Chart.	CO2	14 Marks

(OR)

10.		Examine the role of B2B and B2C in Supply Chain Management for a global manufacturing company. Explicate the process and how it is done using a practical example.	CO5	14 Marks

CODE No.: 16BT60401 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

ANTENNAS AND WAVEGUIDES
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Derive the wave equation for a TM wave and obtain the expression for the field component in a rectangular wave guide.	CO1	8 Marks
	b)	An air-filled rectangular waveguide of inside dimensions 7 x 3.5cm operates in the dominant TE_{10} mode. i) Find the cutoff frequency. ii) Determine the phase velocity of the wave in the guide at a frequency of 3 .5 GHz. iii) Determine the guided wavelength at the same frequency.	CO1	6 Marks

(OR)

2.		Derive the wave equation for TM wave and TE wave. Obtain the expression for the field component in a rectangular wave guide.	CO1	14 Marks

UNIT-II

3.	a)	Explain the following terms: i) Antenna effective height. ii) Antenna aperture. iii) Current distribution on a thin wire antenna.	CO2	8 Marks
	b)	An antenna has a radiation resistance of 72Ω, a loss resistance of 8Ω and a power gain of 12-dB. Determine the antenna efficiency and its directivity.	CO3	6 Marks

(OR)

4.	a)	Define radiation resistance of an antenna. Calculate the radiation resistance of a λ /10wire dipole in free space.	CO4	7 Marks
	b)	Explain the concept of short magnetic dipole.	CO4	7 Marks

UNIT-III

5.	a)	What is the requirement for tapering of arrays? Describe the applications of arrays.	CO5	8 Marks
	b)	Calculate: i) HPBW. ii) Solid angle, if a linear array having 10 isotropic point source with $\lambda/2$ spacing and phase difference δ=900.	CO2	6 Marks

(OR)

6.	a)	What is a broadside array? Explain in detail the structure, radiation pattern and the principle of operation of such an antenna.	CO5	7 Marks
	b)	Write a brief note on binomial arrays.	CO5	7 Marks

UNIT-IV

7.	a)	With a neat sketch, explain the different types of horn antennas. Mention merits and demerits of each type.	CO4	8 Marks
	b)	A Parabolic dish provides a power gain of 50dB at 10GHz, with 70% efficiency. Find out i) HPBW. ii) BWFN.	CO2	6 Marks

(OR)

8.	a)	What is spillover with reference to parabolic reflectors? Explain the remedial measures to reduce spillover.	CO4	7 Marks
	b)	Explain the principle of parabolic reflector antenna and discuss on different types of feeds.	CO5	7 Marks

UNIT-V

9.	a)	Write short notes on source of errors and radiation pattern lobes.	CO6	7 Marks
	b)	Select a suitable coordinate system for antenna measurements and explain about it.	CO5	7 Marks

(OR)

10.	a)	Evaluate the directivity of: i) An isotropic source. ii) Source with bidirectional cosθ power pattern.	CO5	7 Marks
	b)	Explain in detail the terms beam efficiency and directivity. Use relevant expression a diagram.	CO6	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

DIGITAL SIGNAL PROCESSING

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Check the following systems for time variance causality, linearity and stability. i) $y(n)= x(n) + x(n-1)$; ii) $y(n) = n\,x(n)$.	CO4	7 Marks
	b)	Given the sequence x(n)=(5-n)[u9n0-u9n-5), make a sketch of: i) $y(n) = x(4-n)$; ii) $y(n) = x(n^2 - 2n + 1)$.	CO2	7 Marks
		(OR)		
2.	a)	Discuss the concept of causality and stability with examples.	CO2	7 Marks
	b)	State and prove linearity, time shifting and symmetry properties of DFS.	CO4	7 Marks

UNIT-II

3.	a)	Perform circular convolution of the following sequences. $x_1(n) = \{1,2,3,4\}$ and $x_2(n) = \{1,1,2,1\}$	CO2	7 Marks
	b)	With a neat derivation, explain the procedure to compute IDFT using Radix - 2 FFT.	CO1	7 Marks
		(OR)		
4.	a)	An 8 point sequence is given by $x(n)$ {1,0,1,0,1,0,1,0}. Compute 8 point DFT of $x(n)$ by Radix - 2 DIT FFT.	CO1	7 Marks
	b)	Determine 4 point Discrete time Fourier Transform of a sequence $x(n) = \{1, -1, 2, -2\}$.	CO2	7 Marks

UNIT-III

5.	a)	For the given analog transfer function $H_a(s) = 3/(s+1)(s+4)$, determine H(z) for T=1sec using impulse invariant method.	CO5	7 Marks
	b)	Obtain the direct form I and II form realization for the system $y(n) = -0.1y(n-1) + 0.2y(n-2) + 3x(n) + 3.6x(n-1) + 0.6x(n-2)$	CO2	7 Marks
		(OR)		
6.	a)	Design a digital low pass Butterworth digital IIR filter which is required to meet the following specifications. Pass band attenuation ≤ 2dB, Pass band edge frequency = 4KHz, Stop band attenuation ≥ 40dB, Stop band edge frequency = 8KHz, Sampling rate = 24 KHz by using bilinear transformation.	CO5	7 Marks
	b)	Derive an expression for order of the chebyshev analog proto type filter.	CO2	7 Marks

UNIT-IV

7.	a)	Compare an FIR filter with IIR filter. What conditions are to be satisfied by the impulse response of an FIR filter in order to have a linear phase.	CO2	7 Marks
	b)	Obtain direct form and cascade form realizations for the transfer function of an FIR system given by $H(z) = \left(1 - \frac{1}{4}z^{-1} + \frac{3}{8}z^{-2}\right)\left(1 - \frac{1}{8}z^{-1} - \frac{1}{2}z^{-2}\right)$.	CO3	7 Marks
		(OR)		

8.	a)	Analyse the characteristics of rectangular, Bartlet and Blackman windows with neat sketch.	CO3	7 Marks
	b)	Design a Linear phase band pass FIR filter with cutoff frequencies in the range 0.4π to 0.6π rad/sample by taking 7 samples of hamming window.	CO3	7 Marks

UNIT-V

9.	a)	Explain various types of general purpose registers in TMS 320C6X DSP processor.	CO1	7 Marks
	b)	Explain about various on-chip peripherals provided on DSP processors.	CO1	7 Marks

(OR)

10.	a)	Explain the VLIW architecture with its block diagram. State the advantages and disadvantages of VLIW architecture.	CO1	7 Marks
	b)	Discuss in detail bout pipelining of instruction execution in DSP processors.	CO1	7 Marks

CODE No.: 16BT60404 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

IMAGE PROCESSING

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define the terms sampling and quantization and discuss their role in image quality.	CO1	6 Marks
	b)	Discuss about Hadamard transform.	CO2	8 Marks
		(OR)		
2.	a)	Discuss about the arithmetic and logical operations.	CO1	6 Marks
	b)	Find the discrete cosine transform and its inverse for the following images: i) $\begin{matrix} 3 & 6 \\ 6 & 4 \end{matrix}$ ii) $\begin{matrix} 2 & 4 \\ 6 & 1 \end{matrix}$	CO4	8 Marks

UNIT-II

3.	a)	Prove that the probability density function of a histogram equalized image is a uniform density function.	CO2	7 Marks
	b)	Explain image smoothing using ideal lowpass, butterworth and Gaussian lowpass filters in frequency domain.	CO5	7 Marks
		(OR)		
4.	a)	Discuss about sharpening spatial filters.	CO1	7 Marks
	b)	Discuss about homomorphic filtering.	CO1	7 Marks

UNIT-III

5.	a)	Discuss different noise models used in image restoration.	CO1	7 Marks
	b)	Define image restoration. Explain the operation of inverse filtering.	CO3	7 Marks
		(OR)		
6.	a)	Discuss about restoration in the presence of noise only spatial filtering.	CO1	7 Marks
	b)	Explain the method of Constrained Least Squares Filtering for image restoration.	CO4	7 Marks

UNIT-IV

7.	a)	Explain about general image compression system model with the help of a neat block diagram.	CO1	7 Marks
	b)	Discuss about bit plane coding.	CO2	7 Marks
		(OR)		
8.	a)	Explain dictionary based compression with an example.	CO6	7 Marks
	b)	Describe the subjective and objective fidelity criteria.	CO1	7 Marks

UNIT-V

9.	a)	Explain global thresholding.	CO6	7 Marks
	b)	Describe the HIS colour model.	CO6	7 Marks
		(OR)		
10.	a)	Explain region growing by pixel aggregation for image segmentation.	CO5	7 Marks
	b)	With neat diagram, explain intensity slicing in pseudo color image processing.	CO2	7 Marks

CODE No.: 16BT60405 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August – 2021

RADAR ENGINEERING

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Draw the block diagram of Radar and explain its working in detail.	CO1	7 Marks
	b)	Calculate the maximum range of Radar system which operates at 3cm wavelength with peak power of 500KW, if the power of minimum detectable signal is 10-12W, the effective aperture of the receiving Antenna is $5m^2$, and Radar cross section of the target is $20m^2$.	CO4	7 Marks
		(OR)		
2.	a)	Discuss the role of Radar in remote sensing, military, aircraft navigation.	CO1	7 Marks
	b)	A radar has repletion frequency of 1000Hz. Estimate range of radar. Assume the presence of noise.	CO4	7 Marks

UNIT-II

3.	a)	Summarize briefly about the Frequency Modulated Continuous Wave radar system with suitable block diagram.	CO2	7 Marks
	b)	Describe briefly about the Doppler frequency shift in radar operation. A continuous wave radar system is working at a frequency of 10 GHz. If the observed Doppler frequency is 1000 Hz, calculate the radial velocity of the target.	CO4	7 Marks
		(OR)		
4.	a)	With neat diagram, explain the working principle of conventional Continuous Wave (CW) radar.	CO1	7 Marks
	b)	Distinguish between Pulse Doppler Radar (PDR) and Moving Target Indicator (MTI) Radar.	CO1	7 Marks

UNIT-III

5.	a)	Illustrate the working principle of conical scan tracking method with neat diagram.	CO4	7 Marks
	b)	Discuss about the working principle of sequential lobbing with neat diagram for the application of target tracking.	CO4	7 Marks
		(OR)		
6.	a)	Compare the advantages and disadvantages of different target trackers.	CO5	7 Marks
	b)	Draw the functional block diagram of the lobe switching tracking radar system and explain its working principle.	CO4	7 Marks

UNIT-IV

7.	a)	Discuss in brief about: i) branch-type duplexer. ii) circulator as duplexer.	CO1	7 Marks
	b)	Explain how radar signals can be detected under noise considerations.	CO5	7 Marks
		(OR)		
8.	a)	Describe the design procedure of matched filter receiver.	CO3	7 Marks
	b)	Calculate the receiver bandwidth if the noise figure of a radar receiver is 1 dB and the available gain is 400. The available noise output power of the receiver is 4 dB. Assume necessary data if required.	CO4	7 Marks

UNIT-V

9.	a)	Explain the operation of VOR system.	CO5	7 Marks
	b)	Explain the operations of LORAN system.	CO5	7 Marks
		(OR)		
10.	a)	Explain the source of errors in VOR system.	CO6	7 Marks
	b)	Explain the operations DECCA systems.	CO5	7 Marks

CODE No.: 16BT60406 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August – 2021

TELECOMMUNICATION SWITCHING SYSTEMS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain Telephone Communication with the circuit and also explain how to eliminate side tone.	CO1	7 Marks
	b)	Draw and explain Time Division Space Switch.	CO1	7 Marks
		(OR)		
2.	a)	Explain Cross bar switching and blocking configurations.	CO2	7 Marks
	b)	Draw and explain basic time division time switching.	CO1	7 Marks

UNIT-II

3.	a)	Draw and explain cable hierarchy for subscriber loops.	CO1	7 Marks
	b)	Explain about various transmission systems.	CO4	7 Marks
		(OR)		
4.	a)	Draw and explain switching hierarchy and routing techniques.	CO2	7 Marks
	b)	Explain the methods for improving the quality of telecommunication transmission.	CO3	7 Marks

UNIT-III

5.	a)	Compare in channel and Common channel signaling.	CO2	7 Marks
	b)	Explain Telephone Traffic pattern on a working day.	CO1	7 Marks
		(OR)		
6.	a)	Explain why we require wire signaling techniques.	CO3	7 Marks
	b)	Write short notes on Grade of service and blocking probability.	CO1	7 Marks

UNIT-IV

7.	a)	Explain how Data Transmission in PSTNs.	CO3	7 Marks
	b)	Draw and Explain circuit switching network.	CO1	7 Marks
		(OR)		
8.	a)	Write about Expert Systems in ISDN.	CO4	7 Marks
	b)	How the modules are interconnected BISDN and explain?	CO2	7 Marks

UNIT-V

9.	a)	Write about HFC Networks.	CO1	7 Marks
	b)	Explain about synchronous Transport Signals.	CO1	7 Marks
		(OR)		
10.	a)	Write short notes on: i) CM & CMTS. ii) DOCSIS.	CO1	7 Marks
	b)	Explain about Virtual Tributaries.	CO1	7 Marks

CODE No.: 16BT60407 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

DIGITAL CMOS IC DESIGN

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the concept of MOS Transistor Secondary Effects.	CO1	7 Marks
	b)	Illustrate the operation of Pseudo NMOS logic with neat sketch.	CO4	7 Marks
		(OR)		
2.	a)	Articulate the operation of MOS Transistor Characteristic under Static and Dynamic Conditions.	CO1	10 Marks
	b)	Define Technology Scaling operation in MOS Transistor.	CO1	4 Marks

UNIT-II

3.	a)	Illustrate the operation of CMOS inverter with neat sketch.	CO3	6 Marks
	b)	Construct the Stick diagram and Layout of CMOS inverter.	CO3	8 Marks
		(OR)		
4.	a)	Articulate the operation of two-input NAND Gate with the help of CMOS Technology.	CO4	7 Marks
	b)	Write short note on Area capacitance and wire capacitance.	CO4	7 Marks

UNIT-III

5.	a)	Explain about various categories of Memories.	CO1	6 Marks
	b)	Articulate the concept of Flash Memory using NOR flash and NAND flash with neat sketch.	CO1	8 Marks
		(OR)		
6.	a)	Explain the characteristics of Static Random-Access Memory.	CO1	4 Marks
	b)	Articulate the Read and Write operation of SRAM cell with neat Sketch.	CO5	10 Marks

UNIT-IV

7.		Describe the concept Related to Interconnect Parameters.		
		i) Interconnect- Capacitance.	CO2	5 Marks
		ii) Interconnect- Resistance.	CO2	5 Marks
		iii) Interconnect- Inductance.	CO2	4 Marks
		(OR)		
8.		Illustrate the concept of Timing classification of Digital System.		
		i) Synchronous Interconnect.	CO2	7 Marks
		ii) Asynchronous Interconnect.	CO2	7 Marks

UNIT-V

9.		Write Short notes on:		
		i) PLD.	CO6	3 Marks
		ii) CPLD.	CO6	3 Marks
		iii) FPGA.	CO6	4 Marks
		iv) ASIC.	CO6	4 Marks
		(OR)		
10.	a)	Articulate the concept of Economics in VLSI System Design.	CO5	7 Marks
	b)	Illustrate the concept Design Strategies using in VLSI System Design.	CO4	7 Marks

CODE No.: 16BT60408 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

INFORMATION THEORY AND CODING
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Consider a discrete memory less source with source probabilities {0.35, 0.25, 0.20, 0.15, 0.10}. Find the following: CO1 4 Marks
   i) Calculate amount of information gained by observing the source emitting each of these symbols.
   ii) Calculate source entropy.

   b) Consider the following source: CO1 10 Marks
   S = (A, B, C, D, E, F)
   P = (0.10, 0.15, 0.25, 0.35, 0.08, 0.07)
   Apply Shannon-Fanon algorithm to find the code words and also find coding efficiency, redundancy.

(OR)

2. a) Apply the Huffman coding procedure for the following message ensemble: CO1 7 Marks

$$[X] = [\, x_1 \quad x_2 \quad x_3 \quad x_4 \quad x_5 \quad x_6 \quad x_7 \quad x_8 \,]$$

$$[P] = [0.25 \quad 0.125 \quad 0.625 \quad 0.62 \quad 0.625 \quad 0.25 \quad 0.625 \quad 0.125]$$

   Estimate code efficiency and redundancy.

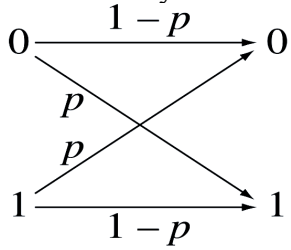
   b) Let 'X' represent the outcome of a single roll of a fair die. Find the entropy of 'X'. CO1 3 Marks

   c) A certain digital frame consists of 15 fields. The first and the last field. Of each frame are same. The remaining 13 fields can be filled by any of the 16 symbols with equal probability. Find the average information conveyed by the frame. Also find the average rate of information, if 100 frames are transmitted every second. CO1 4 Marks

UNIT-II

3. a) Compute Channel capacity of the following channels: CO2 7 Marks
   i) Lossless. ii) Deterministic.
   iii) Noiseless. iv) Binary Symmetric Channel.

   b) Consider a binary symmetric channel as shown in below figure. Estimate the rate of Information transmission over this channel when 'p' value is 0.8. Assume that symbol rate is 2000 symbols/sec. CO2 7 Marks



(OR)

4. A Binary symmetric Channel has the following noise matrix CO2 14 Marks

$$p(X_1) = \frac{2}{3} \text{ and } p(X_2) = \frac{1}{3} \quad p\left(\frac{Y}{X}\right) = \begin{bmatrix} \frac{3}{4} & \frac{1}{4} \\ \frac{1}{4} & \frac{3}{4} \end{bmatrix}$$

Estimate the following:

i) H(X) and H(Y).

ii) H(X,Y).

iii) H(Y/X) and H(X/Y).

iv) I(X,Y).

UNIT-III

5. Consider a (6, 3) linear block code whose generator matrix is given by CO3 14 Marks

$$\begin{bmatrix} 1 & 0 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 1 & 1 & 0 \\ 0 & 0 & 1 & 0 & 1 & 1 \end{bmatrix}$$

i) Find the parity check matrix.

ii) Find the minimum distance of the code.

iii) Draw the encoder and syndrome computation circuit.

(OR)

6. In a Linear Block Code, the syndrome is given by, CO3 14 Marks

$\mathbf{S_1 = r_1 + r_2 + r_3 + r_5}$

$\mathbf{S_2 = r_1 + r_2 + r_4 + r_6}$

$\mathbf{S_3 = r_1 + r_3 + r_4 + r_7}$

i) Find the parity check matrix [H].

ii) Draw the encoder circuit.

iii) Find the code word for all input sequences.

iv) How many errors it can detect and correct.

v) Estimate the syndrome for the received data 1 0 1 1 0 1 1.

UNIT-IV

7. a) Consider a (7, 4) cyclic code with generator polynomial $\boldsymbol{g(x) = 1 + x + x^2}$. Obtain the code Polynomial in a systematic form for the following information sequences: CO4 7 Marks

i) 1011. ii) 1001.

b) Consider a (3, 1, 3) Convolution code with generator polynomials $\mathbf{g_1 = (1\ 1\ 1\ 0)}$, $\mathbf{g_2 = (1\ 0\ 0\ 1)}$ and $\mathbf{g_3 = (1\ 1\ 0\ 1)}$. Do the following: CO4 7 Marks

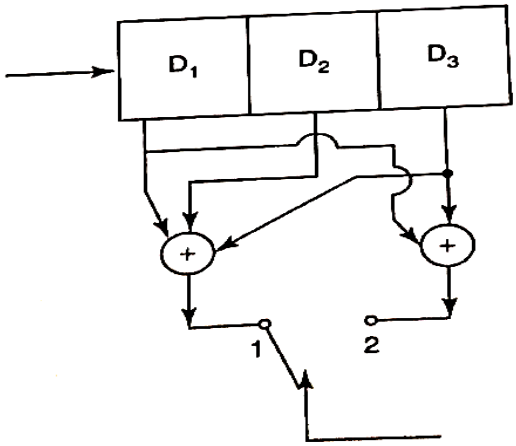
i) Draw its encoder diagram.

ii) Find the encoded sequence for the input (1 0 0 0 1 1 0 1) using time-domain approach

(OR)

8. a) Consider a (7, 4) cyclic code with $g(x) = 1 + x + x^3$. Obtain the syndrome for the received polynomial $r(x) = x^3 + x^5 + x^6$. CO4 7 Marks

b) Consider the convolution encoder as shown in below figure: CO4 7 Marks



Find n, k, m and code rate. Also find the output sequence for the input message sequence (1 1 0 0 1 1) using time domain approach and transform domain approach.

UNIT-V

9. Explain how Coding and Interleaving applied to the compact disc digital audio system. CO5 14 Marks

(OR)

10. Write short note on: CO5 14 Marks
    i) R-S codes.
    ii) Concatenated codes.
    iii) Turbo codes.

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

LIGHT WAVE COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks

UNIT-I

1.	a)	Explain the law of Optics.	CO1	7 Marks
	b)	A light wave is travelling in a semiconducter medium of refractive index 3.6. It is incident on a different semiconducter medium of refractive index 3.4 and the angle of incidence is 80^o.will this result in TIR.	CO4	7 Marks
		(OR)		
2.	a)	Explain the fundamental block diagram for fiber optics communication.	CO1	7 Marks
	b)	A light ray is incident from medium -1 to medium -2. if the refractive indices of mediums are 1.8 and 1.5 respectively, then determine the angle of refraction for an angle of incidence of 40^o.	CO4	7 Marks

UNIT-II

3.	a)	Explain core and cladding losses.	CO4	7 Marks
	b)	Consider two silica fibers that are doped with 6% mole fractions of Geo2. Compute the UV absorption loss at λ=1.3μm.	CO4	7 Marks
		(OR)		
4.	a)	Write a short note on Intramodel dispersion.	CO4	7 Marks
	b)	Consider two silica fibers that are doped with 20% mole fractions of Geo2. Compute the UV absorption loss at λ=0.7μm.	CO4	7 Marks

UNIT-III

5.		Discuss the operation of edge-emitting double-hetero junction LED, with neat schematic diagram.	CO3	14 Marks
		(OR)		
6.		Discuss about the signal frequency, single mode injection lasers with fabry- perot structure and explain the methods of controlling longitudinal modes of ILDs.	CO3	14 Marks

UNIT-IV

7.	a)	Explain the concept of fiber joints.	CO1	7 Marks
	b)	A Step index fiber has a core refractive index of 1.5 and core diameter of 50μm. The fiber is jointed with a lateral misalignment between the core axes of 5μm. Estimate the insertion loss at the joint due to the lateral misalignment assuming a uniform distribution of power between all guided modes, when there is a small air gap at the joint.	CO4	7 Marks
		(OR)		
8.	a)	Explain the different fiber connectors in brief.	CO1	7 Marks
	b)	Two single mode fibers with mode -field diameters of 9.2μm and 8.4μm are to be connected together. Assuming no extrinsic losses, determine the loss at the connection due to the mode-field diameter mismatch.	CO4	7 Marks

UNIT-V

9.		Write short notes on optical networks. i) network terminology. ii) network categories. iii) network layers. iv) network topologies.	CO1	14 Marks
		(OR)		
10.		Explain the principle of WDM networks.	CO5	14 Marks

❀ ❀ ❀

CODE No.: 16BT60501 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

SOFTWARE TESTING
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What are goals of Software Testing? Explain.	CO1	6 Marks
	b)	Why Effective testing is hard? Explain with example.	CO1	8 Marks
		(OR)		
2.	a)	With a neat diagram, explain about all the elements in Software Testing model.	CO1	8 Marks
	b)	What is the difference between : i) Verification and Validation; ii) Static and Dynamic testing.	CO2	6 Marks

UNIT-II

3.	a)	What are the challenges in white box testing? Explain about Basis Path testing with suitable example.	CO2	6 Marks
	b)	How do you calculate the cyclomatic complexity number of the program having many connected components? Explain with an example.	CO2	8 Marks
		(OR)		
4.	a)	Design and develop Data Flow testing with an example.	CO3	8 Marks
	b)	What is the difference between primary and secondary mutants? Explain.	CO2	6 Marks

UNIT-III

5.	a)	Discuss in detail about various techniques that are to be used to generate test scenarios for effective black box testing.	CO3	6 Marks
	b)	Give examples of: i) Decision-table Testing. ii) Cause-Effect Graphic-based Testing.	CO3	8 Marks
		(OR)		
6.	a)	Design and explain in detail about Equivalence Class testing.	CO3	8 Marks
	b)	What are the software implementation issues in state testing? Explain.	CO4	6 Marks

UNIT-IV

7.	a)	Briefly write the steps of test planning and test process for finding factorial of a number.	CO4	8 Marks
	b)	Describe about test case design for validating a user.	CO4	6 Marks
		(OR)		
8.	a)	Write short notes on Size Metrics.	CO5	8 Marks
	b)	Discuss in detail about classification of Software metrics.	CO5	6 Marks

UNIT-V

9.	a)	Why regression testing produces quality software? Explain.	CO3	8 Marks
	b)	Explain in detail the need for Automated Testing tools.	CO5	6 Marks
		(OR)		
10.	a)	Write in detail about the guidelines for Automated testing.	CO5	8 Marks
	b)	Give an overview of some available commercial testing tools.	CO5	6 Marks

CODE No.: 16BT60502 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

SOFT COMPUTING
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Explain Evolution of Neural Networks.	CO1	7 Marks
	b)	Explain Hebb Network.	CO2	7 Marks
		(OR)		
2.	a)	Explain the classification of Hybrid Systems.	CO2	7 Marks
	b)	Write about the applications of Soft Computing.	CO2	7 Marks
		UNIT-II		
3.	a)	Explain the Perceptron testing algorithm for Single and Multiple Output Classes.	CO2	10 Marks
	b)	What is supervised learning?	CO1	4 Marks
		(OR)		
4.	a)	Explain the testing algorithm for back-Propagation Networks.	CO1	7 Marks
	b)	Write about perceptron learning rule.	CO3	7 Marks
		UNIT-III		
5.		What is self-organizing map and discuss the algorithm and features of Kohonen's map?	CO2	14 Marks
		(OR)		
6.		Construct and test the Hamming network to cluster four vectors. Given the example Vectors are $e(1)=[1\ \ -1\ \ -1\ \ -1]$; $e[2]=[-1\ \ -1\ \ -1\ \ 1]$ The bipolar input vectors are $X_1=[1\ \ -1\ \ 1\ \ -1]$ $X_2=[-1\ \ -1\ \ 1\ \ 1]$; $X_3=[-1\ \ -1\ \ -1\ \ +1]$; $X_4=[1\ \ 1\ \ -1\ \ -1]$.	CO4	14 Marks
		UNIT-IV		
7.	a)	With the help of examples, explain various fuzzy prepositions.	CO5	7 Marks
	b)	Show that the following fuzzy sets satisfy DeMorgan's law: i) $\mu A(x) = 1 / 1+5X$ ii) $\mu B(x) = (1 / 1+5x)^{1/2}$	CO4	7 Marks
		(OR)		
8.	a)	Discuss in detail the operations and properties of fuzzy sets.	CO3	7 Marks
	b)	Explain the different methods for fuzzy approximate reasoning.	CO3	7 Marks
		UNIT-V		
9.	a)	Explain in detail about various operators involved in genetic algorithm.	CO3	7 Marks
	b)	Explain the role of fitness function in Genetic algorithms.	CO6	7 Marks
		(OR)		
10.		Explain the genetic operators and fitness functions in respect of evolutionary computing.	CO6	14 Marks

CODE No.: 16BT60503 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

WIRELESS NETWORKS
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain in detail the methods of data services get integrated with Voice Oriented Networks.	CO2	10 Marks
	b)	Explain in detail the architecture of the 2G GSM system.	CO1	4 Marks
		(OR)		
2.	a)	Explain in detail the forward and reverse channels in W-CDMA and CDMA 2000.	CO2	10 Marks
	b)	Explain about the handoff and power control mechanisms.	CO2	4 Marks

UNIT-II

3.	a)	What is location management? What are the three components of location management?	CO3	8 Marks
	b)	Explain in detail about wireless network topologies.	CO2	6 Marks
		(OR)		
4.	a)	Differentiate ADHOC network and infrastructures network topologies.	CO2	8 Marks
	b)	Explain in brief about mobility management.	CO5	6 Marks

UNIT-III

5.	a)	Why IEEE 802.11 standard has two divisions in the MAC layer? Explain in detail about the MAC sub layer.	CO2	8 Marks
	b)	Explain in detail about HAN Technologies.	CO5	6 Marks
		(OR)		
6.	a)	Explain in detail about 802.11b and 802.11a.	CO2	10 Marks
	b)	Write short notes on FHSS, DFIR.	CO3	4 Marks

UNIT-IV

7.	a)	Describe the different logical channels used in the GSM network.	CO5	7 Marks
	b)	Explain the Waveform Encoding for the IS-95 reverse channel.	CO5	7 Marks
		(OR)		
8.	a)	Compare GSM and CDMA.	CO1	7 Marks
	b)	Describe the different interface connection between MS and DTS in a GSM network.	CO5	7 Marks

UNIT-V

9.	a)	Explain in detail about HIPERLAN and BLUETOOTH.	CO6	10 Marks
	b)	Explain the Physical and MAC layer details of Wimax Network.	CO3	4 Marks
		(OR)		
10.	a)	Explain in detail about the IEEE 802.15 WPAN standards.	CO5	10 Marks
	b)	Write short notes of PICONETS and SCATTERNETS.	CO5	4 Marks

CODE No.: 16BT60504 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

PRINCIPLES OF PROGRAMMING LANGUAGES
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What are the important factors that influence the basic design of programming language?	CO1	7 Marks
	b)	Discuss language evaluation criteria and the characteristics that affect them.	CO1	7 Marks
		(OR)		
2.	a)	Explain various user-defined ordinal types with examples.	CO1	7 Marks
	b)	What is meant by type checking? Differentiate between static type checking and dynamic type checking and give their relative advantages.	CO1	7 Marks

UNIT-II

3.	a)	Distinguish between Counter-Controlled Loops and Logically Controlled Loops.	CO2	7 Marks
	b)	Explain Short-Circuit Evaluation with examples.	CO1	7 Marks
		(OR)		
4.	a)	How does operand evaluation order interact with function side effects?	CO2	7 Marks
	b)	Compare the Boolean and Relational Expressions along with examples.	CO2	7 Marks

UNIT-III

5.	a)	What is meant by subprogram level concurrency? Explain.	CO1	7 Marks
	b)	Explain about Co-Routines with an example.	CO3	7 Marks
		(OR)		
6.	a)	Write the Design Issues for Abstract Data Types and compare the Encapsulation and Information Hiding.	CO1	7 Marks
	b)	Discuss the applications of indirect subprogram calls.	CO4	7 Marks

UNIT-IV

7.	a)	What are the primary problems with using semaphores to provide Synchronization?	CO2	7 Marks
	b)	Discuss the design issues of Exception Handling.	CO1	7 Marks
		(OR)		
8.	a)	Compare and contrast the cooperation synchronization and competition synchronization in message passing.	CO2	7 Marks
	b)	Describe the three possible levels of concurrency in programs.	CO3	7 Marks

UNIT-V

9.	a)	Discuss Terms and Goal statements in Prolog with examples.	CO5	7 Marks
	b)	Compare the importance of logic programming languages over functional programming languages.	CO5	7 Marks
		(OR)		
10.	a)	Explain about LISP functional programming language	CO5	7 Marks
	b)	Examine the different types of propositions present in logic programming.	CO5	7 Marks

CODE No.: 16BT61001 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

ARM PROCESSORS AND PIC MICROCONTROLLERS
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Compare Microcontrollers and general purpose Microprocessor.	CO1	7 Marks

	b)	State the contents of the file register RAM locations 12H and WREG after the following program:
		MOVLW 0
		MOVWF 12H
		MOVLW 22H
		ADDWF 12H, W
		ADDWF 12H, W
		ADDWF 12H, W
		ADDWF 12H, W.
			CO2	7 Marks

(OR)

2.	a)	Explain in detail about PIC status register.	CO1	6 Marks
	b)	Write a program to i) place each of your 5-digit ID numbers into a RAM location starting at 0. ii) add each digit to WREG and store the sum in RAM location 6. iii) use the program listing and show the ROM memory addresses and their contents.	CO2	8 Marks

UNIT-II

3.	a)	Explain in detail about Timer 0 and 1.	CO1	8 Marks
	b)	Assuming that XTAL =10 MHz, write a program to generate a square wave of 50 Hz frequency on pin PORTB.7. Use Timer 0, 16 bit mode with prescaler = 128	CO4	6 Marks

(OR)

4.	a)	Explain with example programming the PIC18 to receive the data serially.	CO2	7 Marks
	b)	Describe the different DB9 pins used for handshaking in RS232.	CO1	7 Marks

UNIT-III

5.		Design an interfacing circuit and write a program to send characters (command/data) to the LCD without checking the busy flag and the delay between the issuing character is 5-10 ms(simple delay).	CO3	14 Marks

(OR)

6.	a)	Write a program to rotate the stepper motor by an angle of 180^{o}. Assume step size of 1.8^{o}.	CO1	8 Marks
	b)	Explain the steps in programming the A/D converter using polling.	CO6	6 Marks

UNIT-IV

7.	a)	Mention the CORTEX-M3 Processor applications.	CO1	7 Marks
	b)	With a neat sketch, explain the basic architecture of ARM CORTEX M3.	CO1	7 Marks

(OR)

8.	a)	List the different stages of a pipeline of an ARM CORTEX M3 processor and explain them.	CO3	8 Marks
	b)	List the registers present in different exception modes of ARM CORTEX M3 and explain the functionality of them.	CO1	6 Marks

UNIT-V

9.	a)	Compare ARM Mode and Thumb Mode with example.	CO1	7 Marks
	b)	Explain Data transfer instructions, Pseudo instructions and Data processing instructions.	CO1	7 Marks

(OR)

10.	a)	Write an ALP to perform multiplication of two numbers in arm mode and then switch to thumb mode to perform addition.	CO1	7 Marks
	b)	Explain call, unconditional and conditional branch instructions with example.	CO1	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

PROCESS CONTROL INSTRUMENTATION
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Derive the transfer function of the tank interacting liquid system.	CO2	7 Marks
	b)	Give the characteristics of thermal process and derive the transfer function for single time constant type thermal process.	CO2	7 Marks
		(OR)		
2.	a)	Explain the elements of process control with a neat diagram.	CO1	7 Marks
	b)	Explain Servo and Regulatory operation in process control.	CO1	7 Marks

UNIT-II

3.	a)	Explain On-Off controller characteristics with suitable example.	CO1	7 Marks
	b)	Discuss the working of electronic PID controller and mention the methods for adjusting P, I and D settings.	CO1	7 Marks
		(OR)		
4.	a)	Explain in detail about Pneumatic PID controller with suitable example.	CO1	7 Marks
	b)	Compare the characteristics of P, PI and PID control actions.	CO3	7 Marks

UNIT-III

5.	a)	Describe the points to be considered in selecting controller modes. Mention the criteria for good control.	CO1	7 Marks
	b)	Compare and contrast the features of Ziegler-Nichol's and Cohen-Coon methods of tuning.	CO1	7 Marks
		(OR)		
6.	a)	Explain the frequency response method in controller tuning.	CO1	7 Marks
	b)	Time integral criteria lead to unique solution to determine the controller parameters. Justify.	CO3	7 Marks

UNIT-IV

7.	a)	What is an actuator? List the types of actuators.	CO1	7 Marks
	b)	Identify suitable control valve with one part opening and one seat plug. Explain it with a neat diagram.	CO6	7 Marks
		(OR)		
8.	a)	Explain clearly about hydraulic actuator.	CO1	7 Marks
	b)	Explain the operation of rotating shaft control valve with neat diagrams	CO1	7 Marks

UNIT-V

9.	a)	Write about the analysis of cascade control for set point changes and load changes.	CO6	7 Marks
	b)	Explain the role of load expression in implementing feed forward transfer function.	CO6	7 Marks
		(OR)		
10.	a)	Discuss the working of distillation column with suitable application.	CO1	7 Marks
	b)	Explain clearly about over-ride control with neat sketch.	CO1	7 Marks

CODE No.: 16BT61005 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

OPTO-ELECTRONICS AND LASER INSTRUMENTATION
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Illustrate the significance of total internal reflection and numerical aperture of an optical fiber.	CO1	7 Marks
	b)	Draw the block diagram of a typical fiber optic communication system and illustrate the operation.	CO1	7 Marks
		(OR)		
2.	a)	Explain various splicing techniques with neat diagrams.	CO1	7 Marks
	b)	Demonstrate about Pulse dispersion in step index fibers with the necessary equations and diagrams.	CO1	7 Marks

UNIT-II

3.	a)	Describe the fiber optic instrumentation system for the measurement of strain.	CO3	7 Marks
	b)	Discuss the operation of fiber optic gyroscope with the help of neat sketches.	CO3	7 Marks
		(OR)		
4.	a)	Write short notes on fiber grating sensors and acoustic sensors.	CO3	7 Marks
	b)	List any three applications of optical fibers for instrumentation and explain them with the necessary figures.	CO3	7 Marks

UNIT-III

5.	a)	Illustrate the principle of Q switching and mode locking.	CO1	7 Marks
	b)	Write brief notes on semiconductor lasers and gas lasers.	CO1	7 Marks
		(OR)		
6.	a)	Discuss the methods used for the measurement of velocity and voltage.	CO3	7 Marks
	b)	Describe the structure and operation of glass fiber laser.	CO1	7 Marks

UNIT-IV

7.	a)	With neat sketches, explain the operation of Laser Doppler velocity meter.	CO5	7 Marks
	b)	Mention the significance of LASERS in medicine fields.	CO1	7 Marks
		(OR)		
8.	a)	Illustrate the principle of lasers in melting and trimming of material.	CO5	7 Marks
	b)	Write short notes on laser instruments for plastic surgery and endoscopy.	CO6	7 Marks

UNIT-V

9.	a)	Discuss the phenomenon of electro-optic effect with neat sketches.	CO2	7 Marks
	b)	Write short notes on acoustical holography and 3-D Cinematography.	CO1	7 Marks
		(OR)		
10.	a)	Describe the method of character recognition by holography.	CO1	7 Marks
	b)	Differentiate between magneto-optic and acousto-optic modulators.	CO5	7 Marks

CODE No.: 16BT61006 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

AIRCRAFT INSTRUMENTATION
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define pitch angle. Differentiate between pitch angle and angle of attack.	CO2	7 Marks
	b)	Explain attitude direction indicator.	CO1	7 Marks
		(OR)		
2.	a)	Elaborate on the forces and moments experienced by an aircraft.	CO1	7 Marks
	b)	List the secondary control surfaces and explain their functionalities.	CO1	7 Marks

UNIT-II

3.		Elaborate on the air data instruments.	CO2	14 Marks
		(OR)		
4.		With neat diagram, explain pneumatic air speed indicator.	CO3	14 Marks

UNIT-III

5.		Elaborate on the conventional mechanical gyroscopes.	CO3	14 Marks
		(OR)		
6.		Analyze the working principle of fiber optic gyros with a diagram.	CO3	14 Marks

UNIT-IV

7.		Explain the principle of servo type RPM Indicator with neat sketch.	CO3	14 Marks
		(OR)		
8.	a)	Give various methods of measuring the engine's shaft speed.	CO5	10 Marks
	b)	If speed of the engine is 1420 RPM and torque is 3000 Ft-lbs, then find the horse power of the engine.	CO4	4 Marks

UNIT-V

9.		With suitable diagrams, explain black box operation.	CO2	14 Marks
		(OR)		
10.		Elaborate on fuel quantity indicators.	CO1	14 Marks

CODE No.: 16BT61041 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

PROGRAMMABLE LOGIC CONTROLLERS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	List the benefits offer by PLC. Explain at least four in brief.	CO6	7 Marks
	b)	Explain difference between fixed I/O's and modular I/O's.	CO3	7 Marks
		(OR)		
2.	a)	Draw a block diagram of a PLC showing the main functional items and how busses link them, explaining the functions of each block.	CO1	7 Marks
	b)	Compare ladder logic diagram and relay ladder diagram with examples.	CO2	7 Marks

UNIT-II

3.	a)	Develop ladder logic diagram for each of the following Boolean expressions using AND, OR and NOT gates: i) $Y = ABC + D$; ii) $Y = AB + CD$; iii) $Y = (A + B)(\overline{C} + D)$.	CO2	7 Marks
	b)	Describe in detail about output group register scheme.	CO3	7 Marks
		(OR)		
4.	a)	Explain ON delay timer instruction of PLC with timing diagram and suitable ladder logic example.	CO1	7 Marks
	b)	In an automatic car parking system entry and exit of a car is detected by sensors. A PLC will keep a record of number of cars enter and exit. Maximum 50 numbers of cars in the parking area. An entry gate (controlled by electric motor) will be kept open only when number of cars in the parking area is less than 50. Design a ladder diagram to control the operation of the entry gate of the car parking system.	CO6	7 Marks

UNIT-III

5.	a)	Describe the operation of skip, jump function in PLC.	CO5	7 Marks
	b)	Explain about Sweep functions and their application.	CO5	7 Marks
		(OR)		
6.	a)	Describe the number comparison functions.	CO4	7 Marks
	b)	With neat ladder diagram an instruction list, show how more than one master control relay can be used in a program.	CO4	7 Marks

UNIT-IV

7.	a)	Explain with ladder diagram and the sequence signals of a 4-bit shift register.	CO3	7 Marks
	b)	Explain PLC sequencer functions in detail.	CO4	7 Marks
		(OR)		
8.	a)	Describe controlling of three axis robots with PLC.	CO6	7 Marks
	b)	Explain the ONE shot (ONS) function with an application.	CO3	7 Marks

UNIT-V

9.	a)	Explain the PID control using PLC.	CO4	7 Marks
	b)	Explain how the monitor function is made operational and what data and functions may be observed.	CO5	7 Marks
		(OR)		
10.	a)	Apply the analog IN PLC function operation to convert into discrete O/P.	CO5	7 Marks
	b)	Explain the operation of networking of PLCS.	CO4	7 Marks

❀ ❀ ❀

CODE No.: 16BT61201 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

CLOUD COMPUTNG

[Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define Virtualization. Explain its characteristics and benefits.	CO1	7 Marks
	b)	Explain the various features of VMware technologies.	CO2	7 Marks
		(OR)		
2.	a)	List and explain Pros and Cons of virtualization.	CO1	7 Marks
	b)	Discuss various features of Hyper-V and Zen technologies.	CO2	7 Marks

UNIT-II

3.	a)	Explain about origins and characteristics of cloud computing.	CO3	7 Marks
	b)	Compare various cloud delivery models.	CO1	7 Marks
		(OR)		
4.	a)	Analyze various roles and boundaries in cloud.	CO4	7 Marks
	b)	Differentiate horizontal and vertical scaling.	CO3	7 Marks

UNIT-III

5.		Outline various Cloud-Enabling Technologies i) Data Center Technology. ii) Virtualization Technology. iii) Web Technology. iv) Multitenant Technology.	CO1	14 Marks
		(OR)		
6.		Explain the components in workload distribution and pooling architecture.	CO1	14 Marks

UNIT-IV

7.	a)	Discuss various security services in cloud.	CO1	7 Marks
	b)	Analyze the need for disaster management in cloud.	CO2	7 Marks
		(OR)		
8.		Explain how security is provided to network and host in cloud.	CO2	14 Marks

UNIT-V

9.	a)	Distinguish between SaaS and IaaS.	CO2	7 Marks
	b)	What is platform as a service? Write in detail about Google App engine.	CO5	7 Marks
		(OR)		
10.		Explain in detail about Amazon EC2 and NetFlix with a neat diagram.	CO6	14 Marks

CODE No.: 16BT61202 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

AD-HOC AND WIRELESS SENSOR NETWORKS
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Draw the schematic diagram of the Ad-hoc wireless Internet and discuss the major issues.	CO1	9 Marks
	b)	Why power management is important for Ad-hoc wireless networks?	CO3	5 Marks
		(OR)		
2.	a)	Describe the design goals of a MAC protocol for Ad-hoc wireless networks.	CO1	6 Marks
	b)	How busy tone multiple access protocol overcomes the hidden terminal problem?	CO2	8 Marks

UNIT-II

3.	a)	Explain about the following challenges faced in designing a routing protocol for Ad-hoc wireless networks. i) Hidden and Exposed terminal problems. ii) Mobility. iii) Bandwidth Constraint. iv) Error Prone shared broadcast radio channel.	CO2	6 Marks
	b)	Explain the working of AODV with suitable example.	CO5	8 Marks
		(OR)		
4.	a)	Differentiate source initiated and receiver initiated multicast protocols.	CO1	7 Marks
	b)	Describe the working of bandwidth efficient multicast routing protocol initialization phase and route optimization phase.	CO2	7 Marks

UNIT-III

5.	a)	Illustrate the working of TCP congestion window.	CO2	6 Marks
	b)	Discuss the issues to be considered while designing a transport layer protocol for Ad-hoc wireless networks.	CO2	8 Marks
		(OR)		
6.	a)	Explain the challenges faced when implementing security in Ad-hoc wireless networks.	CO4	6 Marks
	b)	Describe various network layer and transport layer attacks.	CO2	8 Marks

UNIT-IV

7.	a)	What is the need for energy management in Ad-hoc wireless networks?	CO3	5 Marks
	b)	Write about various energy conservation schemes for Ad-hoc networks.	CO3	9 Marks
		(OR)		
8.		Explain in detail about system power management schemes.	CO4	14 Marks

UNIT-V

9.		Explain the wireless sensor network architecture and applications.	CO5	14 Marks
		(OR)		
10.	a)	Compare rumor routing and sequential assignment routing protocols.	CO5	7 Marks
	b)	How location discovery is done in wireless sensor networks.	CO1	7 Marks

CODE No.: 16BT61205 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

CYBER SECURITY AND LAWS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What do you mean by information security? Explain.	CO1	7 Marks
	b)	Discuss different issues and challenges in cyber crimes.	CO1	7 Marks
		(OR)		
2.	a)	Categorize the cyber laws under ITA2000.	CO6	7 Marks
	b)	Why would social engineering be used by a cyber stalker?	CO4	7 Marks

UNIT-II

3.	a)	Briefly explain various types of viruses.	CO1	7 Marks
	b)	What is DDoS attack? Explain.	CO1	7 Marks
		(OR)		
4.		Briefly explain Phishing and Identity theft.	CO1	14 Marks

UNIT-III

5.	a)	What is the need of cyber laws?	CO5	4 Marks
	b)	Explain the impact of Digital Signatures in ITA 2000.	CO2	10 Marks
		(OR)		
6.	a)	State the consequences of not addressing the weakness in IT act.	CO2	10 Marks
	b)	Explain the various offences and punishments on cyber crime.	CO6	4 Marks

UNIT-IV

7.	a)	How social media marketing will impact organization security?	CO4	7 Marks
	b)	Explain Organizational guidelines for internet usage.	CO6	7 Marks
		(OR)		
8.	a)	How peoples privacy is protected in organizations?	CO4	7 Marks
	b)	How cloud computing will affect the security and privacy of an organization?	CO3	7 Marks

UNIT-V

9.	a)	Describe in detail about Intellectual property in the cyber space.	CO3	7 Marks
	b)	Briefly write about the Information warfare.	CO3	7 Marks
		(OR)		
10.	a)	Illustrate the ethical dimension of cyber crimes.	CO2	7 Marks
	b)	Briefly write about the purchasing goods and services scam.	CO2	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

DATA WAREHOUSING AND DATA MINING
[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What is a concept hierarchy? Briefly describe the OLAP operations in the multidimensional data model.	CO3	7 Marks
	b)	Draw a multi tiered data warehouse architecture and explain.	CO3	7 Marks
		(OR)		
2.	a)	Explain the star schema of data warehouse model with the help of diagram.	CO2	7 Marks
	b)	Discuss about the operations roll-up, drill down, slice and pivot in the design of data warehouse.	CO1	7 Marks

UNIT-II

3.	a)	What are various methods for data reduction? Explain with examples.	CO1	7 Marks
	b)	Discuss the challenges that motivate the development of data mining.	CO1	7 Marks
		(OR)		
4.	a)	What is data integration? Discuss the issues to be considered for data integration.	CO2	7 Marks
	b)	Why do we need to preprocess data? What are the different forms of pre-processing?	CO2	7 Marks

UNIT-III

5.	a)	What is meant by frequent item set? Write the Apriori algorithm for frequent item set generation. Explain with example.	CO2	7 Marks
	b)	Discuss Bayesian classification method with example.	CO3	7 Marks
		(OR)		
6.	a)	With an example, explain the classification by decision tree induction.	CO4	7 Marks
	b)	What is association rule mining? Briefly describe the criteria for classifying association rules.	CO4	7 Marks

UNIT-IV

7.	a)	Explain k-means algorithm with an example. Describe the pros and cons of k-means in comparison with the k-medoids algorithm.	CO4	8 Marks
	b)	Describe how categorization of major clustering methods is being done.	CO3	6 Marks
		(OR)		
8.	a)	Explain DBSCAN clustering algorithm in detail.	CO6	7 Marks
	b)	Discuss in detail about hierarchical methods of clustering.	CO5	7 Marks

UNIT-V

9.	a)	Explain web content mining and how it is used for discovering useful information from the web.	CO6	7 Marks
	b)	Describe sequential mining technique with an example.	CO2	7 Marks
		(OR)		
10.	a)	Describe various trends in data mining.	CO2	6 Marks
	b)	What is multimedia data mining? How similarity search can be performed on multimedia data?	CO6	8 Marks

CODE No.: 16BT61502 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

NETWORK SECURITY
[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Explain Five-Step Program for a successful security strategy with figure.	CO1	7 Marks
	b)	Explain why electronic attacks on information systems are easier to make than attacks on paper information systems.	CO1	7 Marks
		(OR)		
2.	a)	Describe a case study of Business Processes ***vs.*** Business Software.	CO1	5 Marks
	b)	Illustrate IP spoofing with relevant figures.	CO1	9 Marks
		UNIT-II		
3.	a)	Why does a packet filtering firewall maintain the state of connections?	CO1	7 Marks
	b)	Examine the differences between VPN types.	CO2	7 Marks
		(OR)		
4.	a)	Explain how to develop firewall configuration.	CO1	7 Marks
	b)	What are the requirements are necessary to set up VPN? What are the benefits and concerns of using site VPNs?	CO2	7 Marks
		UNIT-III		
5.	a)	Illustrate simplified model of symmetric encryption with relevant figure along with principles.	CO2	7 Marks
	b)	Explain Cipher block modes of operation in detail.	CO2	7 Marks
		(OR)		
6.	a)	Illustrate AES encryption and Decryption with figure.	CO3	7 Marks
	b)	Describe RC4 algorithm.	CO3	7 Marks
		UNIT-IV		
7.	a)	Show comparison of SHA parameters and Describe Message digest generation using SHA-512.	CO4	7 Marks
	b)	Explain digital signature with example.	CO4	7 Marks
		(OR)		
8.	a)	Illustrate RSA Public-Key encryption algorithm with example.	CO3	7 Marks
	b)	Clarify Message authentication codes in detail.	CO4	7 Marks
		UNIT-V		
9.	a)	Analyse and describe profiles of behavior of intruders and authorized users.	CO5	7 Marks
	b)	List and describe various types of viruses.	CO5	7 Marks
		(OR)		
10.	a)	Illustrate UNIX Password scheme with figures.	CO6	7 Marks
	b)	What are worms? Explain with examples.	CO5	7 Marks

CODE No.: 16BT70505 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

HUMAN COMPUTER INTERACTION
[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Analyze the history of screen design.	CO2	7 Marks
	b)	Discuss the characteristics of graphical user interface.	CO1	7 Marks
		(OR)		
2.	a)	What is direct and indirect manipulation? Differentiate both.	CO1	7 Marks
	b)	Discuss in detail the popularity of web user interface.	CO3	7 Marks

UNIT-II

3.	a)	Explain the Human considerations in Design.	CO2	10 Marks
	b)	Write short note on human interaction speeds.	CO2	4 Marks
		(OR)		
4.		Discuss about users knowledge and experience in the design of business system.	CO1	14 Marks

UNIT-III

5.	a)	Discuss about organizing and ordering of screen elements.	CO5	7 Marks
	b)	Explain any four qualities which provide visually pleasing composition.	CO6	7 Marks
		(OR)		
6.	a)	Explain various guidelines for presenting information on screen.	CO4	7 Marks
	b)	Write about technological considerations in interface design.	CO2	7 Marks

UNIT-IV

7.	a)	Discuss any five window operations.	CO1	7 Marks
	b)	Explain the guidelines for selecting proper screen based controls.	CO5	7 Marks
		(OR)		
8.	a)	Explain in detail text and messages.	CO1	7 Marks
	b)	Illustrate the guidelines for creating images.	CO5	7 Marks

UNIT-V

9.		Explain various features of interface building tools.	CO5	14 Marks
		(OR)		
10.	a)	What is multimedia? Discuss in detail about multimedia.	CO1	7 Marks
	b)	Write short note on pointing devices.	CO6	7 Marks

CODE No.: 16BT71202 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

MOBILE APPLICATION DEVELOPMENT
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Describe and discuss the base Android OS Features.	CO1	7 Marks
	b)	Explain in detail Android OS Architecture five sections with neat sketch.	CO2	7 Marks
		(OR)		
2.	a)	Explain different Mobile Application users.	CO1	7 Marks
	b)	Write the Hello World first Android application with detailed steps.	CO4	7 Marks
		UNIT-II		
3.	a)	Define Layoutd Discuss different layouts are available in Android.	CO2	7 Marks
	b)	How to display activities as dialog windows explain with one example?	CO1	7 Marks
		(OR)		
4.	a)	What is Intent? Discuss how to linking activities using Intent.	CO1	7 Marks
	b)	Explain how to managing changes to a screen orientation.	CO2	7 Marks
		UNIT-III		
5.	a)	What is a List View? Explain how to use List View in long lists with an example.	CO4	7 Marks
	b)	Write an Android App to display the Date & Time by using Picker View.	CO3	7 Marks
		(OR)		
6.	a)	What is Menu item? Discuss how to create Menu item with your Android App.	CO2	7 Marks
	b)	Create an Android App Database connection steps with suitable example.	CO4	7 Marks
		UNIT-IV		
7.	a)	Explain how to send email messages from your Android App.	CO6	7 Marks
	b)	Develop an Android App how to display and switching another Google Map.	CO6	7 Marks
		(OR)		
8.	a)	What is web service? How to consume the web service in Android OS?	CO3	7 Marks
	b)	Discuss the different ways in which you can send SMS message in your Android App.	CO1	7 Marks
		UNIT-V		
9.	a)	Explain in detail how to establishing communication between a service and an activity.	CO1	7 Marks
	b)	Briefly discuss how to binding activities to services in your Android App.	CO3	7 Marks
		(OR)		
10.	a)	Discuss how to building the Derby App in your iOS.	CO4	7 Marks
	b)	Describe and discuss the different iOS tools with suitable examples.	CO5	7 Marks

CODE No.: 16BT71204 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

MOBILE COMPUTING

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Name the main elements of the GSM system architecture and describe their functions.	CO1	7 Marks
	b)	List the peak data transfer rates for LTE? Explain its functioning.	CO5	7 Marks
		(OR)		
2.	a)	Discuss the Applications and limitations of Mobile computing.	CO1	7 Marks
	b)	Explain security services offered by GSM with relevant Algorithms.	CO1	7 Marks

UNIT-II

3.	a)	Compare IEEE 802.11 and Bluetooth with regard to their ad-hoc capabilities.	CO2	7 Marks
	b)	Perceive the problem of hidden and exposed terminals. Determine what happens in the case of such terminals if Aloha, slotted Aloha, reservation Aloha, or MACA is used.	CO4	7 Marks
		(OR)		
4.	a)	Elaborate various protocols used to provide Bluetooth security.	CO4	7 Marks
	b)	Differentiate Packet reservation multiple access with Demand assigned multiple access methods.	CO2	7 Marks

UNIT-III

5.	a)	List advantages of IPv6 offer for mobility. Identify the additional messages for optimized Mobile IP protocol.	CO4	7 Marks
	b)	Examine the reason why congestion occurs in network. Analyze how does TCP detect and handle congestion.	CO2	7 Marks
		(OR)		
6.	a)	How and why does I-TCP isolate problems on the wireless link? What are the main drawbacks of this solution?	CO1	7 Marks
	b)	Explain the working of Mobile IP with the help of neat diagram.	CO4	7 Marks

UNIT-IV

7.	a)	Explain the concepts of Cache Invalidation mechanisms and what is importance of data cache maintenance and web cache maintenance.	CO1	4 Marks
	b)	Compare and contrast Push Data delivery and Pull Data delivery Mechanisms.	CO2	10 Marks
		(OR)		
8.	a)	Compare database hoarding and data caching. Describe Database hoarding techniques.	CO2	9 Marks
	b)	Which type of indexing is suitable for broad casting data through wireless Channel, why?	CO2	5 Marks

UNIT-V

9.	a)	Why does WAP define its own security layer and does not rely on the security provided by the mobile phone network?	CO1	5 Marks
	b)	Sketch the WAP Architecture. Explain its layers and components briefly.	CO1	9 Marks
		(OR)		
10.	a)	Why doesn't WSP/B put responses into the same order as the requests? Analyze the requests for different items on a web page.	CO2	7 Marks
	b)	Elaborate on how to classify Wireless transaction protocol based on Services provided?	CO4	7 Marks

CODE No.: 16BT71205 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

CRYPTOGRAPHY AND NETWORK SECURITY

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Draw and explain the models of network security.	CO1	7 Marks
	b)	Briefly define the monoalphabetic cipher. What is the difference between a Monoalphabetic cipher and Polyalphabetic cipher?	CO4	7 Marks
		(OR)		
2.	a)	Explain various types of security attacks and security mechanisms.	CO1	7 Marks
	b)	Explain classical encryption techniques with Symmetric cipher and Hill cipher model.	CO4	7 Marks

UNIT-II

3.	a)	Explain the block cipher design principles.	CO2	7 Marks
	b)	Briefly explain the Diffie Hellman Key exchange algorithm.	CO1	7 Marks
		(OR)		
4.	a)	Explain the strength of DES.	CO1	4 Marks
	b)	Explain in detail DES encryption and decryption with neat sketches.	CO2	10 Marks

UNIT-III

5.		Briefly explain the different message authentication functions with neat diagrams.	CO2	14 Marks
		(OR)		
6.	a)	Explain digital signature algorithm.	CO2	7 Marks
	b)	Discuss about HMAC.	CO2	7 Marks

UNIT-IV

7.	a)	Draw the IP Security authentication header and describe the functions of each field.	CO1	7 Marks
	b)	Explain about Secure Socket Layer (SSL).	CO3	7 Marks
		(OR)		
8.	a)	Illustrate how PGP encryption is implemented through a suitable diagram.	CO3	7 Marks
	b)	Explain about transport layer security.	CO2	7 Marks

UNIT-V

9.		Explain about: i) Viruses; ii) Worms; iii) Intruders.	CO1	14 Marks
		(OR)		
10.	a)	Explain about key loggers.	CO4	7 Marks
	b)	Explain Firewall design principles.	CO5	7 Marks

CODE No.: 16BT3HS02 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

MANAGERIAL ECONOMICS AND PRINICIPLES OF ACCOUNTANCY

[Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	Define Managerial Economics and explain its nature.	CO1	14 Marks
	(OR)		
2.	Analyze and suggest a suitable demand forecasting technique for a new and highly technical product being launched by a company.	CO2	14 Marks

UNIT-II

3.	Define "Production Function" and explain "Factors of Production".	CO3	14 Marks
	(OR)		
4.	Determine: i) BEP. ii) Sales required to earn a profit of Rs. 40,000. iii) BEP, when fixed cost increases by Rs. 10,000. iv) BEP when variable cost increases by Rs.20/unit. Selling Price /unit Rs. 200 Variable Cost/unit Rs. 50 Fixed Cost Rs. 1,00,000.	CO2	14 Marks

UNIT-III

5.	Define "Market". Explain essentials of a market structure.	CO1	14 Marks
	(OR)		
6.	Discuss the following: i) Objectives of Pricing. ii) Overpricing and Under pricing. iii) Pricing Policy.	CO3	14 Marks

UNIT-IV

7.	Define Accountancy. Explain concepts and conventions of accounting.	CO1	14 Marks
	(OR)		
8.	Discuss briefly various sources of capital for a business.	CO4	14 Marks

UNIT-V

9.	Define Balance Sheet. Elucidate various elements of balance sheet.	CO1	14 Marks
	(OR)		

10. The trial balance of a firm on 31.12.2018 is as follows. Prepare final accounts of this firm. CO4 14 Marks

Particulars	**Debit(Rs)**	**Credit(Rs)**
Capital		100,000
Plant and Machinery	160,000	
Sales		354,000
Returns	2,000	1,500
Opening Stock	700	
Bank charges	150	
Sundry Debtors	90,000	
Sundry Creditors		51,600
Furniture	60,000	
Wages	20,000	
Salaries	13,600	
Carriage inwards	1,500	
Carriage outwards	2,400	
Bad debts provision		1,050
Rent, rates, taxes	20,000	
Advertisements	4,000	
Cash in hand	1,800	
Cash at bank	12,000	
Purchases	1,20,000	

Adjustments:

i) Closing Stock Rs 17,000.
ii) Depreciate plant 6% P.A.
iii) Interest on capital to be allowed @ 5% P.A.

CODE No.: 16BT5HS01 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

MANAGEMENT SCIENCE

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. Identify different functions of management and explain each one of them with examples. CO1 14 Marks

(OR)

2. a) What are the advantages of Centralization and Decentralization? Explain. CO3 6 Marks
   b) Write the organization structure of your college. What type of structure is that? CO3 8 Marks

UNIT-II

3. a) Explain the basic steps of Method study. CO1 7 Marks
   b) Explain briefly the basic principles involved in preparing the layout of any industrial plant indicating the important techniques available for the purpose. CO2 7 Marks

(OR)

4. a) List and explain the steps involved in work-measurement. CO1 7 Marks
   b) Enumerate the factors affecting quality and explain how to overcome them. CO1 7 Marks

UNIT-III

5. a) Write the differences between on job training and off job training. CO1 6 Marks
   b) What is performance appraisal? List the objectives and steps involved in performance appraisal. CO1 8 Marks

(OR)

6. a) Explain the methods of merit rating with examples. CO1 8 Marks
   b) Enumerate the assumptions of McGregor's theory of 'X' and 'Y'. CO1 6 Marks

UNIT-IV

7. A small project is composed of 8 activities whose time estimates are listed in the table below. CO4 14 Marks

Activity	Predecessor	Estimated duration(Weeks)		
		Optimistic	Most likely	Pessimistic
A	-	1	1	7
B		1	4	7
C		2	2	8
D	A	1	1	1
E	B	2	5	14
F	C	2	5	8
G	D,E	3	6	15
H	F,G	1	2	3

i) Draw the project network and determine the expected project completion time.
ii) What duration will have 95% confidence of project completion?

(OR)

8.	a)	Explain the term 'Entrepreneur'. State the characteristics of an entrepreneur.	CO5	6 Marks
	b)	Differentiate between entrepreneur and manager.	CO5	8 Marks

UNIT-V

9.	a)	What is meant by Business Process Outsourcing? Also state its need.	CO6	7 Marks
	b)	Explain the concept of Just-In-Time and state its advantages.	CO6	7 Marks
		(OR)		
10.	a)	Explain the concept of six sigma.	CO6	7 Marks
	b)	Discuss in detail the role of BPO in the area of manufacturing.	CO6	7 Marks

CODE No.: 16BT6HS02 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

BUSINESS COMMUNICATION AND CAREER SKILLS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Define communication and explain the effectiveness of communication with the help of Mehrabian model.	CO1	14 Marks
		(OR)		
2.	a)	Explain horizontal mode of communication in an organization by giving suitable examples.	CO1	7 Marks
	b)	Explain vertical mode of communication in an organization by giving suitable examples.	CO1	7 Marks

UNIT-II

3.		Analyze the given statement. "It is important for organizations to have a crisis communication plan in place."	CO2	14 Marks
		(OR)		
4.	a)	Summarize 'Reputation Management' and 'Employee Communication' in corporate communication.	CO2	7 Marks
	b)	Summarize 'Community Relations' and Media Relations' in corporate communication.	CO2	7 Marks

UNIT-III

5.		“Writing is crucial to business organizations as it serves as a major source of documentation.” Elucidate the given statement with suitable examples.	CO3	14 Marks
		(OR)		
6.	a)	State the importance of 'Direct Approach Style' in writing a business message.	CO3	7 Marks
	b)	State the importance of 'Indirect Approach Style' in writing a business message.	CO3	7 Marks

UNIT-IV

7.		Explain briefly the various formats of a resume.	CO4	14 Marks
		(OR)		
8.	a)	"Understanding yourself plays a vital role in career building". Justify.	CO4	7 Marks
	b)	"Changes in your personality and in working environment may tend to change your career goals." Justify.	CO4	7 Marks

UNIT-V

9.		Discuss the significance of non-verbal aspects in an interview.	CO5	14 Marks
		(OR)		
10.	a)	Describe the stages involved in an ‘on-campus interview’.	CO5	7 Marks
	b)	Describe the stages involved in an ‘off-campus interview’.	CO5	7 Marks

CODE No.: 16BT6HS11 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

PERSONALITY DEVELOPMENT

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		"Failure can pave the way to success". Describe.	CO1	14 Marks
		(OR)		
2.	a)	List out the strategies to develop self-esteem.	CO1	7 Marks
	b)	List four examples of try-out experiences that might be of interest to you.	CO1	7 Marks

UNIT-II

3.		Classify the consequences for the people who have positive and negative attitudes.	CO2	14 Marks
		(OR)		
4.	a)	"Cultivating a positive attitude requires mental discipline". Interpret.	CO2	7 Marks
	b)	Organize the ideas for overcoming the pull of negativity.	CO2	7 Marks

UNIT-III

5.		"Employers want people who can think". Illustrate.	CO3	14 Marks
		(OR)		
6.	a)	Illustrate the causes and effects of the stress management.	CO3	7 Marks
	b)	Draw out the thinking strategies.	CO3	7 Marks

UNIT-IV

7.		Develop the three basic leadership styles.	CO4	14 Marks
		(OR)		
8.	a)	Supervisor's communication style plays a pivotal role in organizations. Develop the idea.	CO4	7 Marks
	b)	Create a few artificial situations for communicating specially with supervisor and the others.	CO4	7 Marks

UNIT-V

9.		"One should make sure of the rules of one's job by the end of the first day of employment". Justify the statement.	CO5	14 Marks
		(OR)		
10.	a)	Evaluate the purpose of form 'W-4'.	CO5	7 Marks
	b)	Planning 'career' plays a significant role in one's life. Evaluate.	CO5	7 Marks

CODE No.: 16BT30503 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January - 2022

PYTHON PROGRAMMING
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the Fundamental concepts of Computer software.	CO1	7 Marks
	b)	Describe the essence of computational problem solving.	CO2	7 Marks
		(OR)		
2.	a)	Model the limits of computational problem solving.	CO2	7 Marks
	b)	Compare and Contrast syntax errors with semantic errors.	CO1	7 Marks

UNIT-II

3.	a)	Explain while statement in python with example.	CO2	7 Marks
	b)	Write a python script to calculate sum of individual digits of a given number using while.	CO5	7 Marks
		(OR)		
4.	a)	Differentiate between input error checking and infinite loops.	CO3	7 Marks
	b)	Write a python script to display Fibonacci sequence of numbers using while loop, for loop and do-while loop constructs.	CO5	7 Marks

UNIT-III

5.	a)	For the following recursive functions, indicate which of the requirements of a properly designed recursive function each violates	CO2	7 Marks

```
i) def   rfunc1(n):
         return n + rfunc( n-1)
ii) def  rfunc2(n):
         if  n==0:
         return 1
         return  n+ rfunc2(n+1).
```

	b)	Specify the requirements to design proper recursive function.	CO2	7 Marks
		(OR)		
6.	a)	Implement a Python code that determines how many times a given letter occurs in a given string using Recursion.	CO4	7 Marks
	b)	List out various String Methods used in Python.	CO1	7 Marks

UNIT-IV

7.	a)	Explain the fundamental features of turtle graphics.	CO1	7 Marks
	b)	Develop a simple program for bouncing ball using multiple turtles.	CO5	7 Marks
		(OR)		
8.	a)	Describe the use of object references.	CO4	7 Marks
	b)	Write a python script to create turtle graphics window and explain.	CO5	7 Marks

UNIT-V

9.	a)	Discuss about the tkinter pragmatics in Python Programming.	CO1	7 Marks
	b)	Compare and contrast about all tkinter extensions.	CO2	7 Marks
		(OR)		
10.	a)	Write a brief note on structure of tkinter package.	CO1	7 Marks
	b)	List and explain the uses of Lambda.	CO2	7 Marks

CODE No.: 16BT40502 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, January 2022

DATA BASE MANAGEMENT SYSTEMS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Identify different types of database users and write in detail about their roles.	CO2	7 Marks
	b)	List and explain the advantages of DBMS.	CO1	7 Marks
		(OR)		
2.	a)	Write short notes on the following and give examples to each: Entity, Entity sets, Relationship and Relationship sets.	CO1	7 Marks
	b)	How to maintain class hierarchies in ER-Diagrams? Explain with employee database.	CO2	7 Marks

UNIT-II

3.	a)	Create a view with fields register name and stud-name and explain how to implement views.	CO3	7 Marks
	b)	Distinguish candidate key and primary key with an example relation.	CO1	7 Marks
		(OR)		
4.	a)	Discuss about Set operations in relational algebra with examples.	CO1	7 Marks
	b)	Explain the following terms with an example: i) condition-join ii) equi-join iii) natural-join	CO1	7 Marks

UNIT-III

5.	a)	Write the basic form of SQL query and explain.	CO1	7 Marks
	b)	Consider the following schemas: Sailors (sid, sname, rating, age) Reserves (sid, bid, day) Boats (bid, bname, color) Write the following queries in relational algebra, tuple relational Calculus and domain relational calculus: i) Find the name of sailors who have reserved boat 103. ii) Find the names and ages of sailors with a rating above 7. iii) Find the names of sailors who have reserved a red boat.	CO4	7 Marks
		(OR)		
6.	a)	Discuss the problems caused for the redundancy and the purpose of normalization.	CO2	7 Marks
	b)	Describe properties of decompositions.	CO1	7 Marks

UNIT-IV

7.	a)	Illustrate concurrent execution of transaction with examples.	CO1	7 Marks
	b)	Discuss about Implementation of Isolation.	CO1	7 Marks

(OR)

8.	a)	Explain the concept of multiple granularity with a suitable example.	CO1	7 Marks
	b)	Describe the various transaction states in detail.	CO1	7 Marks

UNIT-V

9.	a)	Enumerate Indexed Sequential Access Method in detail.	CO1	7 Marks
	b)	Illustrate insertion of an element in B+ trees with an example.	CO4	7 Marks

(OR)

10.	a)	Show the method to reduce access time with primary index by considering example.	CO3	7 Marks
	b)	Make a comparison of hash file organization with heap file organization.	CO1	7 Marks

CODE No.: 16BT50308 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, January 2022

MECHATRONICS
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Describe the various levels of mechatronic system with examples.	CO1	8 Marks
	b)	Discuss the design approach of a Mechatronic system.	CO1	6 Marks
		(OR)		
2.	a)	Explain the terms stability, Accuracy and Response with respect to a system.	CO1	6 Marks
	b)	Design a mechatronic system for controlling a temperature control of refrigeration system.	CO5	8 Marks

UNIT-II

3.	a)	Describe any two proximity sensors with neat diagrams.	CO2	8 Marks
	b)	Explain how thermistors can be used as temperature sensor.	CO2	6 Marks
		(OR)		
4.	a)	What is a load cell? Explain the working of strain gauge load cell.	CO2	8 Marks
	b)	Explain how control valves can be used as processing elements.	CO2	6 Marks

UNIT-III

5.	a)	Explain one type of DAC with a neat sketch.	CO3	8 Marks
	b)	Explain the importance of data acquisition system.	CO3	6 Marks
		(OR)		
6.	a)	Signal conditioning is required for meaning full analysis of any signal. Justify and explain various components in it.	CO3	8 Marks
	b)	Mention the use of current-voltage converters in a mechatronic system.	CO3	6 Marks

UNIT-IV

7.	a)	Discuss, in detail, the methods of PI and PD controllers.	CO4	8 Marks
	b)	"Adaptive controllers are the future". Justify with an example with clear explanation.	CO4	6 Marks
		(OR)		
8.	a)	Explain PID controller with circuit diagram.	CO4	8 Marks
	b)	Discuss any two methods of tuning the controller.	CO4	6 Marks

UNIT-V

9.	a)	"Ethics should be followed in designing a Mechatronic System" Justify.	CO6	8 Marks
	b)	Describe the elements of an Antilock braking system with a neat block diagram.	CO5	6 Marks
		(OR)		
10.		Explain the application of mechatronics in present day engine control unit. Mention atleast 3 sensors and 3 actuators.	CO5	14 Marks

CODE No.: 16BT50501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, January 2022

COMPUTER NETWORKS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	With a neat diagram explain Internet architecture.	CO1	7 Marks
	b)	Compare 4-Layer TCP/IP Model and 7-Layer OSI Model.	CO2	7 Marks
		(OR)		
2.	a)	Summarize the features of wireless LANs: 802.11.	CO2	7 Marks
	b)	Assess the impact of wireless transmission media in the context of network applications.	CO6	7 Marks

UNIT-II

3.	a)	What is the remainder obtained by dividing $x^7 + x^5 + 1$ by the generator Polynomial $x^3 + 1$?	CO4	7 Marks
	b)	Write the data link layer design issues.	CO1	7 Marks
		(OR)		
4.	a)	Describe one-bit sliding window protocol with an example.	CO1	7 Marks
	b)	Briefly describe the differences between store-and-forward and cut-through switches.	CO2	7 Marks

UNIT-III

5.	a)	Suppose all of the interfaces in each of three subnets are required to have the prefix 223.1.17/24. Also suppose that Subnet 1 is required to support at least 60 interfaces, Subnet 2 is to support at least 90 interfaces, and Subnet 3 is to support at least 12 interfaces. Provide three network addresses that satisfy these constraints.	CO3	7 Marks
	b)	Compare IPv4 and IPv6 protocols.	CO2	7 Marks
		(OR)		
6.	a)	Apply distance vector routing algorithm to compute shortest path routing.	CO5	7 Marks
	b)	Draw the IPv6 packet header format.	CO1	7 Marks

UNIT-IV

7.	a)	Explain why the client issues an active open for the control connection and a passive open for the data connection.	CO1	6Marks
	b)	Elaborate TCP Congestion Control mechanisms. Differentiate these mechanisms.	CO2	8 Marks
		(OR)		
8.	a)	Sketch the state transition diagram of TCP connection establishment, data transfer and termination and explain it.	CO1	6 Marks
	b)	Summarize the functions of Real-time Transport control protocol.	CO2	8 Marks

UNIT-V

9.	a)	Tabulate the various HTTP request operations.	CO1	7 Marks
	b)	Discuss the working of email in detail.	CO1	7 Marks
		(OR)		
10.	a)	Briefly explain the Domain Name Service protocol with an example.	CO1	7 Marks
	b)	When user clicks a hyperlink, what are the steps that occur between the user's click and the page being displayed?	CO4	7 Marks

❀ ❀ ❀

CODE No.: 16BT51203 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, January 2022

WEB TECHNOLOGIES
[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the creation of "mouseovers" in JavaScript. Give examples to change the Size and Color of the Text in a Web Page.	CO5	7 Marks
	b)	Explain the following suitable example. i) Spell-check ii) Content Editable iii) Custom data attributes iv) Offline web applications.	CO1	7 Marks
		(OR)		
2.	a)	Explain the frames and table tags of HTML with suitable example.	CO1	7 Marks
	b)	Design a web page to drag and drop an object on a web browser using a mouse.	CO5	7 Marks

UNIT-II

3.	a)	Design a web page to enroll student details including Name, Id, Address, Mobile No. and e-Mail id.	CO2	7 Marks
	b)	Compare and contrast JavaScript and JQuery features.	CO2	7 Marks
		(OR)		
4.	a)	Design a web page that display credit card type and then validate the entered card number according to the card type.	CO6	7 Marks
	b)	Summarize the properties and methods of JavaScript String object.	CO2	7 Marks

UNIT-III

5.	a)	Develop a mobile optimized webpage using the following i) Glyph Icons ii) Navigation bar.	CO5	7 Marks
	b)	Classify different layouts in **bootstrap.**	CO2	7 Marks
		(OR)		
6.	a)	Develop a mobile optimized webpage using the following i) Alerts ii) Tool bars and button group.	CO5	7 Marks
	b)	Develop a web page using nested grid column layout.	CO5	7 Marks

UNIT-IV

7.	a)	Build a PHP code to retrieve variables passed using GET and POST super global variables.	CO3	7 Marks
	b)	Explain the PHP code embedding procedure into web pages.	CO1	7 Marks
		(OR)		
8.	a)	Build a PHP Page to read User Name and Favorite Programming language from the html form.	CO3	7 Marks
	b)	Explain the various methods offered by PHP to output data into browser. Write a PHP code to demonstrate each method.	CO1	7 Marks

UNIT-V

9.		Develop a PHP page that reads user details like name, id, gender, date of birth, address, phone no. and email id and then store the same into MySQL database.	CO6	14 Marks

(OR)

10.	a)	Develop a PHP code to perform the following: i) To fetch employee records from MySQL database. ii) To Update employee salary by 10% whose experience greater than 15 years.	CO6	10 Marks
	b)	List and explain transaction methods of MySQL.	CO1	4 Marks

CODE No.: 16BT51241 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, January 2022

OBJECT ORIENTED PROGRAMMING
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What are all the characteristic features of Java Programming language?	CO1	6 Marks
	b)	Compare and contrast visibility controls and also compare with each of them.	CO2	8 Marks
		(OR)		
2.	a)	Java is platform independent. Justify?	CO4	6 Marks
	b)	Compare and Contrast Java with C. Explain Constructors with examples.	CO2	8 Marks

UNIT-II

3.	a)	Explain the importance of inheritance with the help of an example?	CO1	6 Marks
	b)	What are packages? What are the benefits of creating programs using packaging?	CO1	4 Marks
	c)	How to create an interface? Distinguish between abstract classes and interfaces.	CO1, CO2	4 Marks
		(OR)		
4.	a)	How is multiple inheritance achieved in Java?	CO1	3 Marks
	b)	Develop a Library interface which has drawbook(), returnbook() (with fine), checkstatus() and reservebook() methods. All the methods tagged with public.	CO6	11 Marks

UNIT-III

5.	a)	Differentiate between exceptions , runtime errors and compile time errors	CO2	4 Marks
	b)	Difference between Thread and Process in Java? How to implement Thread in Java?	CO2	5 Marks
	c)	Develop a java program to read 20 marks and store them in an array, Define your own exception named wrong mark exception. Throw and catch this type of exception when a mark is (<0 and >100).	CO3	5 Marks
		(OR)		
6.	a)	When to use Runnable vs Thread in Java? Difference between start() and run() method of Thread class?	CO2	4 Marks
	b)	Differentiate throw and throws keyword in Java? Can the same exception been declared to be thrown many times by the method. **eg:** `public void sample() throws IOException, SQLException`	CO1	5 Marks
	c)	Develop a java program for producer consumer problem to illustrate the concept of multithreading.	CO3	5 Marks

UNIT-IV

7.	a)	What is an Event? Explain the role of Event handler in AWT.	CO1	5 Marks
	b)	Design and Develop an Applet to receive the value of the parameter message from the html file and display it on the webpage.	CO3	9 Marks

(OR)

8.	a)	What is Java Collections Framework? List out some benefits of Collections framework?	CO1	6 Marks
	b)	Create an anonymous inner class for handling mouse entered event into an Applet.	CO5	8 Marks

UNIT-V

9.	a)	List and explain the different situations in which the Action Event is generated? Develop the event handler for the Action Event.	CO2, CO4	10 Marks
	b)	Explain the life cycle methods of a servlet.	CO4	4 Marks

(OR)

10.	a)	What do you mean by HTTP servlet request and response? What is the procedure for initializing a servlet?	CO1	7 Marks
	b)	What is the advantage of having anonymous classes while handling events in Java?	CO1	7 Marks

CODE No.: 16BT60101 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

FOUNDATION ENGINEERING
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Briefly explain about Standard Penetration Test with neat sketch and the corrections to be applied to find 'N' value.	CO1	7 Marks
	b)	Compute the area ratio of a thin walled tube samples having an external diameter of 60 cm and wall thickness of 2.25 mm. Do you recommend the sampler for obtaining un-disturbed soil samples?	CO2	7 Marks
		(OR)		
2.	a)	Discuss various types of soil samplers for obtaining undisturbed samples.	CO1	6 Marks
	b)	What are the methods of soil exploration? Describe briefly Geo Physical methods of sub-surface exploration.	CO1	8 Marks

UNIT-II

3.		A gravity retaining wall retains 10 m of a backfill, unit weight of soil = 18 kN/m^3, angle of shearing resistance = 30^o with a horizontal surface. Assume the wall interface to be vertical, determine (i) the magnitude and point of application of the total active pressure (ii) if the water table is at a height of 5 m, and how far do the magnitude and the point of application of active pressure changed. Take submerged unit weight = 10 kN/m^3.	CO2	14 Marks
		(OR)		
4.	a)	Describe the procedure of computing active earth pressure behind a retaining wall using Culmann's graphical method.	CO1	7 Marks
	b)	A retaining wall is 7m high, with its back face smooth and vertical. It retains sand with its surface horizontal. Using Rankine's theory, determine magnitude and line of action of active earth pressure at the base when the backfill is: i) Dry and ii) submerged, with water table at the surface. Take Y=18 kN/m^3 ii) Y_{sat}= 21 kN/m^3 and ϕ'=300.	CO2	7 Marks

UNIT-III

5.	a)	Explain the Bishop's method of analysis for stability of slopes.	CO2	6 Marks
	b)	A cutting 8m deep is to be made in a saturated clay soil with γ = 20kN/m^3, C_u = 20 kN/m^2 and φ = 0^o. A hard stratum exists at a depth of 12m below the ground level. Determine the angle of the slope at which failure would occur.	CO2	8 Marks
		(OR)		
6.	a)	Write short notes on: i) Taylor's stability number. ii) Types of slope failure.	CO1	6 Marks
	b)	The average height of a 2.0m wide earth slice is 20m. The properties of soil are: c′=23 kPa, φ'= 30^o, γ= 17 kN/m^3. The water table is located at a depth of 4.0m below the surface along the centre line of slice. The bottom of the slice is inclined at 30^o to horizontal. Calculate the safety factor against sliding using effective stress analysis.	CO2	8 Marks

UNIT-IV

7.	a)	Derive Terzaghi's bearing capacity equation.	CO2	7 Marks
	b)	A square footing is resting on stiff saturated clay with unconfined compression strength of 200kN/m². The depth of foundation is 2m. Determine the size of the footing if the column load is 700 kN. Assume a factor of safety as 2.5. The bulk unit weight of soil is 20kN/m³. What will be the change in ultimate, net ultimate and safe bearing capacity if the water table is at ground level?	CO2	7 Marks

(OR)

8.	a)	Explain plate load test, in detail.	CO1	7 Marks
	b)	A footing 6m x 4m in plan, transmits a pressure of 150 kN/m² on a cohesive soil having E = 6 x 104 kN/m² andμ = 0.50. Determine the immediate settlement at the centre, assuming it to be: i) flexible footing. ii) a rigid footing.	CO2	7 Marks

UNIT-V

9.	a)	Briefly explain dynamic formulae of load carrying capacity of piles.	CO1	6 Marks
	b)	A 16 pile group was driven into soft clay extending to a large depth. The diameter and length of the piles were 30 cm and 9 m respectively. If the unconfined compression strength of the clay is 9 t/m² and the pile spacing is 90 cm c/c, what is the capacity of the group? Assume a factor of safety of 3 and the adhesion factor of 0.7.	CO3	8 Marks

(OR)

10.	a)	What are the different shapes of foundation wells and what are their comparative merits and demerits?	CO1	6 Marks
	b)	What are the various components of well foundation and discuss them in detail?	CO1	8 Marks

CODE No.: 16BT60104 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, January 2022

FIRE ENGINEERING
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Briefly explain the different types of fire spread.	CO1	7 Marks
	b)	Compare the Complete combustion and Incomplete combustion	CO2	7 Marks
		(OR)		
2.		Discuss any case study related to unconfined vapour cloud explosion (UVCE) in detail.	CO4	14 Marks

UNIT-II

3.	a)	Explain in detail about the fire triangle measure in building.	CO1	7 Marks
	b)	What are the strategies to be adopted for fire prevention?	CO8	7 Marks
		(OR)		
4.		Write short notes on i) Fire stoppers ii) Foam generators iii) Fire station	CO1	14 Marks

UNIT-III

5.	a)	Illustrate the 'Deluge and Emulsifier' system.	CO2	7 Marks
	b)	Explain the method of Water Sprinkler System.	CO4	7 Marks
		(OR)		
6.		Discuss the CO_2 system and Dry chemical powder (DCP) system.	CO6	14 Marks

UNIT-IV

7.		As an engineer how would you describe safety as an essential parameter in designing residential building?	CO3	14 Marks
		(OR)		
8.	a)	Discuss the necessity of fire certificates.	CO8	7 Marks
	b)	Mention the fire safety requirements for high rise buildings.	CO6	7 Marks

UNIT-V

9.	a)	Compare the detonation and blast waves.	CO2	7 Marks
	b)	Give the details of plant for generation of inert gas.	CO9	7 Marks
		(OR)		
10.		Describe the Rupture disc in process vessels and lines explosion.	CO10	14 Marks

CODE No.: 16BT60110 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January - 2022

SOLID WASTE MANAGEMENT
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Describe legislation for municipal solid waste. CO8 7 Marks
   b) Using the data for a municipal solid waste sample provided below, find the average moisture content of the sample. Base your calculations on a 100 kg sample size. CO2 7 Marks

Component	Moisture Content (%)	Weight (%)
Paper Waste	7	25
Yard Waste	55	18
Food Waste	65	20
Plastic	2	5
Wood	20	8
Glass	3	7
Metals	3	9
Textiles	12	8

(OR)

2. Investigate the importance of public awareness and role of NGOs in effective solid waste management. CO4 14 Marks

UNIT-II

3. Describe the types of storage methods and materials used for the storage containers. CO1 14 Marks

(OR)

4. Discuss on-site processing of solid wastes in medium and high rise buildings. CO5 14 Marks

UNIT-III

5. Describe the operation of hauled container system and stationary container system of waste collection. CO9 14 Marks

(OR)

6. a) Discuss briefly about layout of collection routes. CO1 7 Marks
   b) Explain the factors to be considered in deciding collection frequency in a solid waste management system to achieve the environment sustainability. CO7 7 Marks

UNIT-IV

7. Describe the various processing techniques of solid waste. CO5 14 Marks

(OR)

8. Explain the factors influencing the process of composting. State various practical problems associated with it. CO1 14 Marks

UNIT-V

9. a) Describe the occupational hazards and safety measures in Bio-medical waste management. CO6 7 Marks
   b) Write short note on Environmental factors in sanitary landfill sites. CO9 7 Marks

(OR)

10. Explain design and operation of sanitary landfill. CO3 14 Marks

❀ ❀ ❀

CODE No.: 16BT60118 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

RURAL TECHNOLOGY

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Differentiate between ancient agriculture and traditional agriculture.	CO2	7 Marks
	b)	Krishna want to grow cotton in his crop field through traditional method in Hosoor village. What is the process involved from sowing seeds to storage?	CO1	7 Marks
		(OR)		
2.	a)	Thandrapadu is one of the backward village in Kurnool District with lack of infrastructure facilities. Choose the technologies that can improve the rural infrastructure.	CO4	7 Marks
	b)	Chandrasekhar is recently elected as the panchayat president of Puttramraju Kandriga village and started developing the village. Explain the roles and responsibilities involved under Panchayat Raj Institutions.	CO1	7 Marks

UNIT-II

3.	a)	Day by day waste generation is increasing more and to minimize this waste 3R principle use is necessary. What is meant by 3R principle? State the advantages of 3R principle.	CO4	7 Marks
	b)	Ramesh who supplies solar cooker from Bangalore and want to sell in the village. What is the principle behind the working of solar cooker?	CO2	7 Marks
		(OR)		
4.	a)	The increase of wood waste and animal waste is more in the village Ramapuram which is near to the forest area. Show how the waste can be used by the rural people with the technology for cooking.	CO4	7 Marks
	b)	Explain the various alternate sources of technologies in particular to solar.	CO4	7 Marks

UNIT-III

5.	a)	Define tissue culture. Explain briefly how the production of one of the ornamental plant orchids can be increased with the plant tissue culture.	CO4	7 Marks
	b)	Explain the role of food and agro based technologies in rural development.	CO4	7 Marks
		(OR)		
6.		The government of India is giving training to the rural women who is unemployed. Discuss in detail the role of cottage industries in rural development.	CO1	14 Marks

UNIT-IV

7.	a)	Raghunath is an agricultural scientist wants to give awareness to the rural people about the usage of organic fertilizers in the crop filed. Suggest the importance and uses of bio fertilizers.	CO6	7 Marks
	b)	Pandurangapuram which is one of the village in the drought prone area of the Rayalaseema area. Show how rain water technology is useful for the village.	CO4	7 Marks
		(OR)		

8.	a)	Write the importance of medical and aromatic plants and explain their need in community development.	CO5	7 Marks
	b)	Give solution how dry land can be converted to farming land keeping in view of biofertilizers.	CO1	7 Marks

UNIT-V

9.	a)	What is meant by CSR? How development can be achieved with the involvement of private sector participation in the rural area?	CO3	7 Marks
	b)	Write a short note on village adoption schemes focusing particularly in Andhra Pradesh and in India.	CO1	7 Marks

(OR)

10.		Information technology for the rural development is a boon or bane and apply its principles for a specific purpose.	CO2	14 Marks

CODE No.: 16BT60201 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January - 2022

POWER SEMICONDUCTOR DRIVES
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Derive the fundamental torque equations governing DC Motor load dynamics.	CO1	10 Marks
	b)	Compare DC and AC drives.	CO2	4 Marks

(OR)

2.	a)	Derive the mathematical conditions for steady state stability analysis of equilibrium operating point.	CO2	10 Marks
	b)	Mention the necessary condition to obtain the three modes of operation of an electric drive.	CO1	4 Marks

UNIT-II

3.		Analyse the operation of 3φ fully controlled converter fed dc drive with neat waveforms for $\alpha=30^{o}$ and $\alpha=120^{o}$ and give the justification about the waveforms.	CO2, CO4	14 Marks

(OR)

4.	a)	Explain using a power circuit the working of a single phase semi converter fed separately excited motor drive.	CO1	10 Marks
	b)	What are the advantages of three phase drives over the single phase drives?	CO1	4 Marks

UNIT-III

5.	a)	Discuss the four quadrant operation of chopper control in a DC motor drive.	CO2	8 Marks
	b)	With a neat diagram, illustrate the closed loop model of separately excited DC motor drive.	CO1	6 Marks

(OR)

6.	a)	Explain the motoring mode operation of chopper fed DC motor.	CO1	6 Marks
	b)	Compare regenerative braking and dynamic braking of separately excited DC motor by chopper control and identify the suitable braking method for DC motor.	CO5	8 Marks

UNIT-IV

7.	a)	With an aid of a neat diagram, explain the operation of static Scherbius system for slip power recovery scheme	CO1	10 Marks
	b)	Compare Current Source Inverter drive with Voltage Source Inverter drive in steady state conditions.	CO4	4 Marks

(OR)

8.	a)	Discuss the steady state analysis of constant slip-speed controlled induction motor.	CO2	7 Marks
	b)	Explain the speed control scheme employed in industries for induction motor drive with stator voltage control and mention the reason for choosing induction motor drive rather than other motor drives.	CO6	7 Marks

UNIT-V

9.	a)	Analyse the operation of self-controlled synchronous motor with Voltage Source Inverter	CO2	10 Marks
	b)	When can a synchronous motor be load commutated?	CO1	4 Marks

(OR)

10.	a)	Explain self-control of synchronous motor drive operated with constant margin angle control.	CO1	10 Marks
	b)	Mention the different modes employed to achieve variable frequency control in synchronous motors.	CO1	4 Marks

CODE No.: 16BT60202 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

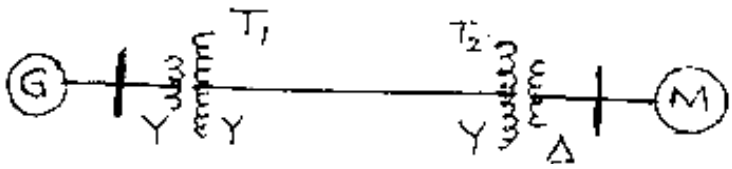
POWER SYSTEM ANALYSIS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	List the advantages of per unit system of computations.	CO1	6 Marks
	b)	Draw the per unit impedance diagram of the system shown in figure, by taking a base of 100 MVA, 11 kV in the generator circuit. The various components ratings are: Transformer T_1: 3 phase 90 MVA, 11/110 kV, X=10%; Transformer T_2: 3 single phase units of each 33.33 MVA, 68/6.6 kV, X=10 %; Synchronous generator: 80 MVA, 10 kV, X=10%; synchronous motor: 95 MVA, 6.3 kV, X=15% and the line reactance is 20 Ω.	CO3	8 Marks

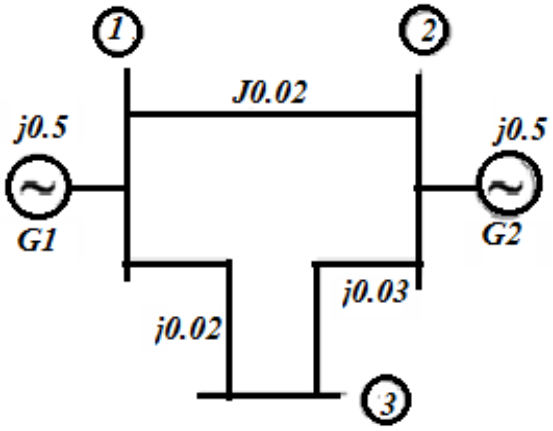


(OR)

2.	a)	Write a note on significance of unsymmetrical fault analysis by symmetrical component transformations.	CO1	7 Marks
	b)	Given the sequence components of a phase voltages:V_{b1}=100; V_{c2}=10j and V_{ao}=10; Determine the phase voltages V_a, V_b and V_c.	CO3	7 Marks

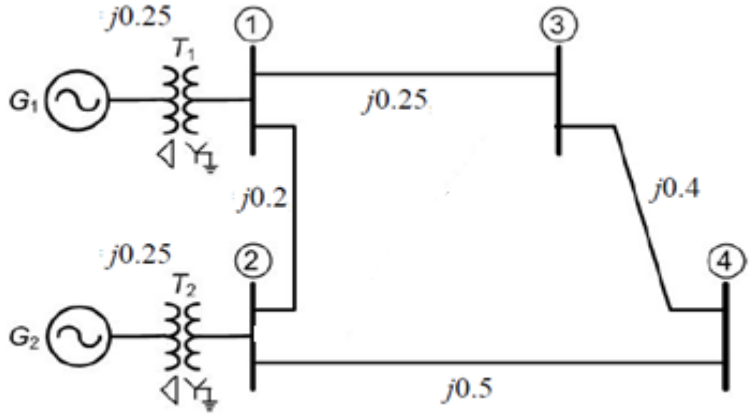
UNIT-II

3.	a)	Prove that when there is no mutual coupling between the elements of a network, the diagonal and off-diagonal elements of the bus admittance matrix can be computed as $Y_{ij} = \sum_{i=j} y_{ij}$ and $Y_{ij} = Y_{ji}$.	CO2	6 Marks
	b)	Develop a Y_{bus} by direct inspection method for the given power system shown in figure with reactances mentioned in *p.u*.	CO3	8 Marks



(OR)

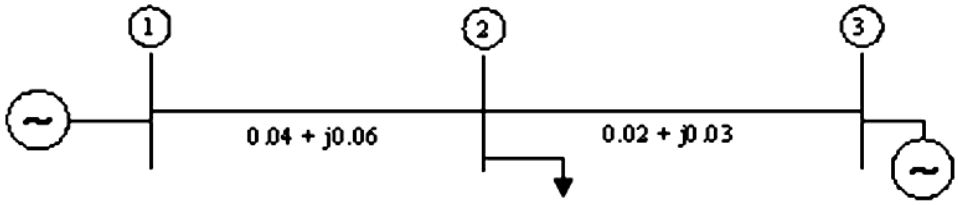
4. Construct the Z_{bus} for the network shown using Z_{bus} building algorithm — CO3 — 14 Marks



UNIT-III

5. a) Derive the static load flow equations of n-bus system. — CO2 — 4 Marks

b) Obtain the complex bus voltages at bus No. 2 and 3 at the end of first iteration, using GS method for the network shown in figure. The line impedances are mentioned in p.u.; Given Bus-1 is slack bus with $V_1=1.0\angle 0°$; $P_2 + jQ_2 = -5.96 + j1.46$; $|V_3| = 1.02$; $P_3 = 2.0$ p.u. Assume $V_2 = 1\angle 0°$ and $V_3 = 1.02\angle 0$. — CO4 — 10 Marks



(OR)

6. a) Derive the expressions for diagonal and off-diagonal elements of Jacobin matrix of N-R (Polar form) method. — CO5 — 7 Marks

b) Explicate in detail with a flow chart, the computational procedure for load flow analysis using decoupled method deriving necessary equations. — CO1 — 7 Marks

UNIT-IV

7. a) What are the different types of faults in power system? Justify which types of faults are more severe and are more frequent. — CO1 — 4 Marks

b) A 3-phase, 3-wire system has a normal voltage of 10·4 kV between the lines. It is supplied by a generator having positive, negative and zero sequence reactances of 0·6, 0·5 and 0·2 Ohms per phase respectively. Calculate the fault current which flows when a line-to-line fault occurs at the generator terminals. — CO3 — 10 Marks

(OR)

8. Develop the sequence network for a double line to ground (LLG) fault and express the fault current in terms of sequence components of the network. — CO2 — 14 Marks

UNIT-V

9. a) Derive an expression for the maximum power transfer between two nodes. Show that this power is maximum when $X = \sqrt{3}R$, where X is the reactance and R the resistance of the system. — CO2 — 7 Marks

b) Station A transmits 50 MW of power to station B through a tie line. The maximum steady state capacity of the line is 100 MW. Determine the allowable sudden load that can be switched on without loss of stability. — CO2 — 7 Marks

(OR)

10. a) Define the following terms: CO1 6 Marks

i) Steady state stability limit.

ii) Dynamic state stability limit.

iii) Transient state stability limit.

b) A synchronous generator operating at 50 Hz delivers 1 p.u. power to an infinite bus bar through a network in which resistance may be neglected. A fault occurs which reduces the maximum power transferable to 0.4 p.u., whereas before the fault this power was 1.8 p.u., and after the clearance of the fault it is 1.3 p.u. By the use of equal area criterion, determine the critical clearing angle for designing a circuit breaker operating time. CO3 8 Marks

CODE No.: 16BT60203 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January - 2022

DESIGN AND ESTIMATION OF ELECTRICAL SYSTEMS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Draw and explain a typical wiring diagram for a house installation showing connections for energy meter, main switch and distribution boards.	CO1	7 Marks
	b)	List out the general rules to be followed for internal wiring.	CO1	7 Marks
		(OR)		
2.		Design and develop the layout of electric wiring and estimate the quantity of material required and cost, for PVC conduit wiring system proposed to be used in a hall with dimensions 15m x 6m x $4\frac{1}{2}$ m. The hall is to be fitted with fan points and light points. Make your own assumptions for number of fans and light points required and other missing data. Follow IE rules while designing and estimating the wiring system.	CO3, CO7	14 Marks

UNIT-II

3.	a)	List out the main components of an Over Head Transmission lines.	CO1	6 Marks
	b)	An Over Head 11 kV, 50 Hz line has to be erected using 27 kg, 10 m long steel poles and copper wire of size no. 3/2.6424 m, with an average span of 150 m. Furnish the list of material required and estimate the cost/km.	CO3	8 Marks
		(OR)		
4.		An OH 11 kV, 50 Hz, 3-phase line is to be tapped off from the existing 11 kV line pole at about 90^0 angle. The proposed line has to be erected on 10 m long RCC poles with ACSR conductor of size 6/1 x 2.11 mm with average span of 100 m. Line has to pass through the city area spreading about 500 m long. Furnish the list of material required and estimate the cost for 3.2 km long line.	CO3, CO4	14 Marks

UNIT-III

5.	a)	State some important points that guides in carrying out wiring for a motor installation.	CO1	5 Marks
	b)	Prepare and exhibit the layout and estimate for installation of a 7 HP, 3-phase, 415 V Squirrel cage motor in a workshop of size 5m x 5m at the centre with main board at one corner of the workshop.	CO3	9 Marks
		(OR)		
6.	a)	Categorize the power circuits on the basis of applications and explain.	CO2, CO5	7 Marks
	b)	Calculate the size of the conductor to be used for wiring of 15 HP, 400 V, 3-phase, 50 Hz Induction Motor. Consider the efficiency and power factor of motor as 0.85 and 0.8 respectively.	CO4	7 Marks

UNIT-IV

7.	a)	Explain the following terms. i) Illumination. ii) Luminous intensity. iii) Lamp efficiency. iv) Space-height ratio.	CO1	7 Marks
	b)	A small assembly shop with 16 m long, 10m wide and 3 m up to trusses is to be illuminated to a level of 20 lux. The utilization and maintenance factors are 0.74 and 0.8 respectively. Calculate the number of lamps required to produce 3000 lumens.	CO4	7 Marks

(OR)

8.		Write short notes on: i) Sodium vapour lamp. ii) High pressure mercury vapour lamp.	CO1	14 Marks

UNIT-V

9.	a)	List out various types of heating and explain about resistance heating in detail.	CO1	7 Marks
	b)	Explain in detail about dielectric heating.	CO2	7 Marks

(OR)

10.	a)	Suggest and explain suitable welding technique to fabricate transformer oil tank.	CO5	7 Marks
	b)	A 20 kW, 1-phase, 220 V resistance oven employs a circular Nichrome wire as its heating element. If the wire temperature is not to exceed 1127^0 C and the temperature of a charge is to be 427^0C. Design a heating element assuming emissivity, e=0.9 and radiation efficiency, K=0.6. Consider the specific resistance of a Nichrome wire as 1.09×10^{-6} Ω-m.	CO3, CO4	7 Marks

CODE No.: 16BT60204 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January - 2022

DIGITAL SIGNAL PROCESSING FOR ELECTRICAL ENGINEERS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Investigate whether the following signals are periodic or not. CO2 8 Marks

i) $x(n) = \cos\left(\frac{5\pi}{9}n + 1\right)$. ii) $x(n) = \sin\frac{\pi}{8}n^2$.

iii) $x(n) = \sin\left(\frac{n}{9} - \pi\right)$. iv) $x(n) = e^{\frac{j7\pi n}{4}}$.

b) Determine whether the following signals belongs to energy or power signals. CO2 6 Marks

i) $x(n) = \left(\frac{1}{4}\right)^n u(n)$. (ii) $x(n) = \sin\left(\frac{\pi}{3}n\right)$. (iii) $x(n) = u(n)$.

(OR)

2. Find the impulse response and step response of a discrete-time linear time invariant system whose difference equation is given by CO2 14 Marks

$y(n) = y(n-1) + 0.5y(n-2) + x(n) + x(n-1)$.

UNIT-II

3. a) Find the DFT of sequence $x(n) = \{1, 0, 1, 0\}$ using DIF-FFT algorithm. CO4 4 Marks

b) Write the procedure to compute DIF - FFT for N=8 with neat sketch. CO4 10 Marks

(OR)

4. a) Write the advantages of FFT algorithm in computing DFT. CO1 4 Marks

b) Discuss Decimation in time and decimation in frequency algorithms in detail. CO1 10 Marks

UNIT-III

5. Design a digital Butterworth filter using bilinear transformation. The specifications of the desired Low Pass filter is. CO3 14 Marks

$0.9 \le |H(\omega)| \le 1; \quad 0 \le \omega \le \frac{\pi}{2}$

$|H(\omega)| \le 0.2; \quad 3\frac{\pi}{2} \le \omega \le \frac{\pi}{2}$

(OR)

6. a) For the analog transfer function $H(s) = \frac{2}{(S+1)(S+2)}$. Determine its digital transfer function using impulse invariance method and bilinear transformation method taking $T = 1$sec. CO3 10 Marks

b) What is warping effect in bilinear transformation? Explain in brief. CO1 4 Marks

UNIT-IV

7.	a)	Compare the characteristics of different types of windows used in the design of FIR filter.	CO2	10 Marks
	b)	What is Fourier series method of designing FIR filters?	CO1	4 Marks

(OR)

8.	a)	How to characterize Linear phase FIR filters using delay functions?	CO1	6 Marks
	b)	Show that the magnitude response $\|H(\omega)\|$ of an FIR filter is symmetric when impulse response is symmetric and N is even.	CO2	8 Marks

UNIT-V

9.		Develop a flow chart for implementing voltage regulation scheme in Buck-Boost converter using TMSLF2407 processor.	CO5	14 Marks

(OR)

10.		In a residential apartment, solar panel is required to rotate in steps by using a stepper motor. Interface the stepper motor with TMSLF2407 processor for controlling its speed in two phase half-step mode.	CO6	14 Marks

CODE No.: 16BT60205 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January - 2022

ELECTRICAL MACHINE DESIGN
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain various factors affecting the choice of the specific electric loading on a machine while designing.	CO1	7 Marks
	b)	Write the significance of leakage reactance calculation.	CO1	7 Marks
		(OR)		
2.	a)	List the factors that impose technical limitations on the design of electrical machines. Explain any three in brief.	CO1	7 Marks
	b)	A 700 kW, 700 V, 500 RPM, 6 pole DC generator is built with an armature diameter of 0.87 m and a core length of 0.32 m. The lap wound armature has 660 conductors. Calculate the specific magnetic and electric loadings.	CO2	7 Marks

UNIT-II

3.	a)	List and discuss the factors affecting the choice of specific electric loading of DC machine.	CO1	7 Marks
	b)	Determine suitable values for the number of poles, diameter and length for a 1000 kW, 500 V, and 300 RPM DC shunt generator. Assume average gap density of 1 Tesla and specific electric loading as 400 Ampere conductors / centimeter.	CO4	7 Marks
		(OR)		
4.	a)	Predict the performance of DC machine using design values.	CO1	7 Marks
	b)	Estimate the main dimensions of a 200 kW, 250 Volts, 6 pole, 1000 RPM DC generator to meet the specifications. The maximum value of flux density in the air gap is 0.87 Wb/m^2 and the ampere conductors per metre length of armature periphery are 31000; The ratio of pole arc to pole pitch is 0.67 and the efficiency is 91 percent; Assume that the ratio of length of core to pole pitch as 0.75.	CO3	7 Marks

UNIT-III

5.	a)	Describe the methods of cooling of transformers.	CO1	7 Marks
	b)	List the advantages and disadvantages of stepped cores. Give reasons for circular coils are widely used in transformers.	CO1	7 Marks
		(OR)		
6.	a)	Prepare the list of factors to be considered for selecting the cooling methods of a transformer.	CO1	7 Marks
	b)	Calculate the core and window areas required for a 1000 kVA, 6600 V/400 V, 50 Hz, single phase core type transformer. Assume a maximum flux density of 1.25 Wb/m^2 and a current density of 2.5 A/mm^2. Voltage per turn = 30 V. Window space factor = 0.32.	CO4	7 Marks

UNIT-IV

7.	a)	List and explain the design considerations for reducing harmonic torques in induction motor.	CO1	7 Marks
	b)	Find the values of diameter and length of stator core of a 7.5 kW, 415 V, 50 Hz, 4 pole, 1425 RPM, 3 phase delta connected induction motor. Bav=0.45 Wb/m², ac=2300 amp. cond./m, full load efficiency = 0.85, Power factor = 0.88. Assume (L/τ) value is unity.	CO4	7 Marks

(OR)

8.	a)	Explain the design of squirrel cage rotor.	CO5	8 Marks
	b)	Write about dispersion co-efficient applied to induction motors. Discuss its effect on maximum power factor and overload capacity of induction motors.	CO1	6 Marks

UNIT-V

9.	a)	Derive output equation of synchronous machine.	CO2	7 Marks
	b)	Evaluate the main dimensions of stator core for an 8 pole alternator rated at 3300 kVA, 300 V, 50 Hz. Assume specific electric loading to be 28000 amp. cond./m and magnetic loading to be 0.6 Wb/m². Pole arc is equal to 0.65 times pole pitch. Assume square pole.	CO4	7 Marks

(OR)

10.	a)	Explain the factors to be considered while selecting number of armature slots in the design of a synchronous machine.	CO1	7 Marks
	b)	Compute the main dimensions of a 12 MVA, 13.8 kV, 50 Hz, 1500 RPM, 3-phase star connected alternator. Bav= 0.6 Tesla, ac = 42000 amp. cond./m, peripheral speed = 80 m/s. Find also the maximum flux.	CO4	7 Marks

CODE No.: 16BT60206 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January - 2022

HVDC TRANSMISSION

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Distinguish AC and DC transmission in detail.	CO1	7 Marks
	b)	With neat sketches, explain the different kinds of dc links available in HVDC transmission.	CO1	7 Marks
		(OR)		
2.	a)	State the advantages and disadvantages of dc transmission system in terms of economics, reliability and performance.	CO6	7 Marks
	b)	Explain the applications of HVDC transmission.	CO6	7 Marks

UNIT-II

3.	a)	Comment on the choice of the converter configuration for a pulse number at converter station.	CO2	7 Marks
	b)	Elucidate the features of converter transformer and its influence on the HVDC converter station.	CO6	7 Marks
		(OR)		
4.	a)	Draw the schematic diagram of a 6 pulse gratez's circuit and explain its principle of operation.	CO1	7 Marks
	b)	Explain the individual characteristics of a HVDC inverter with sketches.	CO1	7 Marks

UNIT-III

5.	a)	What is meant by current margin between two stations in a HVDC link? Why is the inverter station operated as a constant voltage controller under normal conditions?	CO2	7 Marks
	b)	Comprehend constant extinction angle control with relevant illustrations.	CO1	7 Marks
		(OR)		
6.	a)	Illustrate the starting and stopping of a DC link.	CO1	7 Marks
	b)	Explain inverse cosine control scheme for firing pulse generations.	CO1	7 Marks

UNIT-IV

7.	a)	Enumerate the types of filters employed in HVDC converter station. Discuss them in detail.	CO1	7 Marks
	b)	What are the adverse effects of harmonics produced by the HVDC converters?	CO6	7 Marks
		(OR)		
8.	a)	Write short notes on the following: i) Telephone influence factor. ii) Harmonic distortion.	CO1	7 Marks
	b)	Discuss the effect of pulse number and overlap angle on harmonics generated by HVDC converters.	CO6	7 Marks

UNIT-V

9.		Explain the role of DC breakers in the protection of HVDC converter station. Also, mention their applications.	CO6	14 Marks
		(OR)		
10.	a)	Explain the basic principle of operation over voltages in converter station.	CO2	7 Marks
	b)	How do the components of a DC line protect the HVDC converter station?	CO6	7 Marks

❀ ❀ ❀

CODE No.: 16BT60207 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

ADVANCED CONTROL SYSTEMS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. Consider a unity feedback system with open loop transfer function given by $G(S) = \frac{5}{S(S+0.5)(S+1)}$ CO3 14 Marks

   Design a PD controller so that the phase margin (γ) of the system is 30^0 at a frequency (ω_n) of 1.2 rad/sec.

(OR)

2. a) With a suitable example, explicate the root locus approach for the design of lead compensator. CO1 8 Marks
   b) Derive the transfer function of lag compensator. CO2 6 Marks

UNIT-II

3. Convert the given transfer function model into controllable canonical form CO1 14 Marks

$$\frac{Y(S)}{U(S)} = \frac{S^3 + 8S^2 + 17S + 8}{S^3 + 6S^2 + 11S + 6}$$

(OR)

4. a) State and explain Kalman's principle of duality. CO1 8 Marks
   b) Check whether the second order state model given below is controllable and/or observable. CO2 6 Marks

$$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ 1 & 1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 2 \end{bmatrix} U$$

UNIT-III

5. Analyze the stability of the system given by the second order differential equation by plotting the phase trajectory using isoclines method. CO2 14 Marks

$$\ddot{e} + \xi \omega_n \dot{e} + \omega_n^2 e = 0$$

where $\zeta = 0.15$, $\omega_n = 1$ rad/sec, e(0) = 1.5 and e(0)=0

(OR)

6. a) Explain the concept of 'Describing function' for analysis of non-linear systems. CO1 7 Marks
   b) Discuss the characteristics of non-linear systems. CO1 7 Marks

UNIT-IV

7. Using lyapunov theorem analyze the stability of the given state model CO5 14 Marks

$$\dot{X} = AX;\ A = \begin{bmatrix} -1 & 1 \\ -2 & -4 \end{bmatrix}$$

(OR)

8. a) Determine the stability of a non linear system governed by the state equations CO4 8 Marks

$$\dot{x}_1 = -x_1 + 2x_1^2 x_2$$

$$\dot{x}_2 = -x_2$$

b) Explicate the stability in the sense of Lyapunov. CO1 6 Marks

UNIT-V

9. Determine the state feedback gain matrix (K) for the state model defined by CO2 14 Marks

$$\dot{X} = AX + BU; A = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -1 & 5 & -6 \end{bmatrix}; B = \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix}$$

with the desired poles at $S = -2 \pm j4$ and $S = -10$.

(OR)

10. a) What are the necessary conditions for arbitrary pole placement? CO1 6 Marks

b) Derive the reduced order state equations from the full order observer. CO2 8 Marks

CODE No.: 16BT60210 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

SPECIAL ELECTRICAL MACHINES
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What is meant by half stepping? Explain how it is achieved in a 2- phase 2- Pole Permanent magnet stepper motor.	CO1	7 Marks
	b)	Sketch and explain the static and dynamic characteristics of stepper motor.	CO1	7 Marks
		(OR)		
2.	a)	Sketch the closed loop control circuit of a 2-phase hybrid stepper motor. Discuss the working of various blocks of this control circuit.	CO1	10 Marks
	b)	Discuss about applications of stepper motor in computer peripherals.	CO6	4 Marks

UNIT-II

3.	a)	How Switched Reluctance Motor is different from Variable reluctance stepper motor?	CO2	5 Marks
	b)	From the fundamentals, derive the expression for torque developed in a switched reluctance motor.	CO2	9 Marks
		(OR)		
4.	a)	A switched reluctance motor with six stator poles and four rotor poles has a stator pole arc of 30° and a rotor pole arc of 32°. The aligned inductance is 10.7 mH and the unaligned inductance is 1.5 mH. Saturation can be neglected. Sketch the L-θ profile. Calculate the instantaneous torque when the rotor is 30° before the aligned position and the phase current is 7 A. Neglect fringing.	CO4	10 Marks
	b)	What is the need for sensing the rotor position of Switched reluctance motor? Explain how hall probes are useful in rotor position sensing with the help of Hall effect.	CO5	4 Marks

UNIT-III

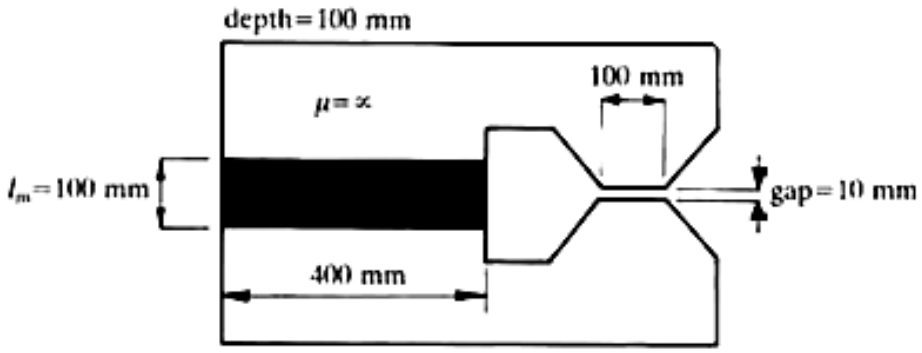
5.	a)	Compare Synchronous Reluctance Motor (SyRM) with Switched Reluctance Motor (SRM).	CO2	5 Marks
	b)	A 3-phase, 4 Pole, 50 Hz, 400V star connected synchronous reluctance motor has direct axis and quadrature axis synchronous reactances of 8Ω and 2Ω respectively. For a load torque of 80 N-m, find load angle, line current and power factor. Neglect armature resistance and mechanical losses.	CO4	9 Marks
		(OR)		
6.	a)	Explain the constant direct axis current control of Synchronous Reluctance motor with the help of a block diagram.	CO1	7 Marks
	b)	Discuss the different rotor structures of Synchronous reluctance motor and compare them.	CO1	7 Marks

UNIT-IV

7.		Perform the magnetic circuit analysis of a three phase BLDC motor and hence derive the expression for Permeance coefficient.	CO2	14 Marks

(OR)

8.	a)	The below figure shows a magnet used in Magnetic Resonance (MR) experiments for non-invasive medical diagnosis. Calculate the flux-density in the work space if the permanent magnet is ferrite with a remanent flux-density of 0.4 T and a straight demagnetization characteristic with recoil permeability of 1.0.	CO4	7 Marks



	b)	Explain the constructional details and principle of operation of BLDC square wave motor.	CO1	7 Marks

UNIT-V

9.	a)	The frequency of voltage applied to a linear induction motor is 50 Hz. The pole pitch of its double-sided primary is 10 cm. Find its synchronous velocity.	CO4	4 Marks
	b)	Explain the constructional details and working of a transverse flux linear induction motor.	CO1	10 Marks

(OR)

10.	a)	Develop the equivalent circuit of a linear induction motor at standstill and running conditions.	CO3	6 Marks
	b)	The following data are given for a linear induction motor: Supply frequency=25 Hz, Input power =6 kW, Stator copper loss and iron loss=1.2 kW, Velocity of the motor=2.4 m/s, Pole pitch=0.6 cm. Find the gross mechanical power developed and thrust developed.	CO4	8 Marks

CODE No.: 16BT60301 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January - 2022

CAD/CAM
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Briefly describe the steps involved in CAD design process.	CO1	10 Marks
	b)	Classify the CAD standards.	CO1	4 Marks
		(OR)		
2.		Differentiate between product cycle in conventional and computerized manufacturing systems with the help of neat diagrams.	CO2	14 Marks

UNIT-II

3.		Elucidate the Bresenham's Line algorithm in detail.	CO5	14 Marks
		(OR)		
4.	a)	Explain in detail about 2D transformations.	CO1	7 Marks
	b)	Illustrate the Constructive Solid Geometry (CSG) in detail.	CO4	7 Marks

UNIT-III

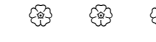
5.	a)	Discuss the feedback devices used in CNC.	CO2	7 Marks
	b)	What is Canned cycle? Explain it with an example.	CO1	7 Marks
		(OR)		
6.	a)	Sketch and explain automatic tool changers.	CO3	7 Marks
	b)	Write a short note on Preparatory and Miscellaneous functions.	CO1	7 Marks

UNIT-IV

7.	a)	Briefly explain the Opitz coding system generally used in group technology.	CO6	10 Marks
	b)	List out the benefits of GT.	CO1	4 Marks
		(OR)		
8.		Enumerate the difference between retrieval type and generative type CAPP systems. List down the merits and de-merits of each type.	CO2	14 Marks

UNIT-V

9.	a)	Elucidate the process of SLA in rapid prototyping.	CO5	7 Marks
	b)	Name the benefits of CIM.	CO1	7 Marks
		(OR)		
10.		List out various types of CMM. Explain each of them in detail with neat sketches.	CO1	14 Marks



CODE No.: 16BT60302 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

HEAT TRANSFER
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the importance of Thermal Conductivity.	CO1	6 Marks
	b)	An immersion water heater of surface area 0.1 m^2 and rating 1 KW is designed to operate fully submerged in water. Estimate the surface temperature of the heater when the water is at 40^0C and the heat transfer coefficient is 300 W/m^2K. If this heater is by mistake used in air at 400C with h= 9 W/m^2K, what will be its surface temperature?	CO5	8 Marks
		(OR)		
2.		Derive the general two-dimensional unsteady state heat conduction equation for an isotropic solid cylindrical rod with internal heat generation. Simplify the obtained equation to Poisson's equation, Fourier's Equation and Laplace equation.	CO2	14 Marks

UNIT-II

3.		Derive an expression of Temperature distribution through a infinitely long rectangular fin by stating its assumptions. Also estimate the heat flow, Efficiency and Effectiveness through the fin.	CO5	14 Marks
		(OR)		
4.		A metallic sphere of radius 10mm is initially at a uniform temperature of 400^0C. It is heat treated by first cooling it in air(h=10 W/m^2K) at 20^0C until its central temperature reaches 335^0C. It is then quenched in a water bath at 20^0C with h= 600 W/m^2K until the center of the sphere cools from 335^0C to 50^0C. Compute the time required for cooling in air and water for the following physical properties of the sphere. P = 3000 kg/m^3, C_p = 1000 J/kg-K, K=20W/m K, $\alpha = 6.66 \times 10^{-6}$ m^2/s. Also calculate the surface temperature at the end of cooling in water.	CO3	14 Marks

UNIT-III

5.	a)	Briefly explain the concept of heat transfer by free convection	CO1	7 Marks
	b)	A horizontal plate 1 m x 0.8 m is kept in a water tank with the top surface at 60^0C providing heat to warm stagnant water at 20^0C. Determine the value of convection coefficient.	CO2	7 Marks
		(OR)		
6.		Water at 60^0C enters a tube of 2.54 cm diameter at a mean velocity of 2 cm/s. Calculate the exit water temperature if the tube is 3.0 m long and wall temperature is constant at 80^0C.	CO2	14 Marks

UNIT-IV

7.		In a counter flow double pipe heat exchanger, oil is cooled from 85^0C to 55^0C by water entering at 25^0C. The mass flow rate of oil is 9,800 kg/h and specific heat of oil is 2000 j/kg K. the mass flow rate of water is 8,000 kg/h and specific heat of water is 4180 j/kg K. Determine the heat exchanger area and heat transfer rate for an overall heat transfer coefficient of 280 W/m^2 K.	CO5	14 Marks

(OR)

8.		Saturated steam, at 120^0C condenses on a 2cm OD vertical tube which is 20cm long. The tube wall is maintained at a temperature of 119^0C. Calculate the average heat transfer coefficient and the thickness of the condensate film at the base of the tube. Assume Nusselt solution is valid.	CO2	14 Marks

UNIT-V

9.	a)	State and explain Kirchoff's identity. What are the conditions under which it is applicable?	CO4	7 Marks
	b)	Two parallel grey planes with emissivities of 0.8 and 0.7 are maintained at 800^0C and 1500^0C. What is the net radiant energy exchange? What would be the reduction in heat transfer, if a radiation shield of polished aluminum (Emissivity = 0.04) is placed between them?	CO4	7 Marks

(OR)

10.	a)	Distinguish between a black body and grey body.	CO2	6 Marks
	b)	Estimate the solar radiation on a plate normal to the sun rays. Assume the sun to be a black body at a temperature of 55200C. The diameter of the sun is 1.39×10^6Km and its distance from the earth is 1.5×10^8km.	CO3	8 Marks

CODE No.: 16BT60303 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, January 2022

NON-CONVENTIONAL ENERGY SOURCES
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the depletion process of solar radiation as it passes through the atmosphere to reach the surface of the earth.	CO1	10 Marks
	b)	List the various non-conventional energy sources.	CO2	4 Marks
		(OR)		
2		Estimate the monthly average of daily global radiation on a tilted surface.	CO3	14 Marks

UNIT-II

3	a)	Explain the basic components of a solar collector and its working principle.	CO2	8 Marks
	b)	How is the performance of a flat plate collector evaluated?	CO2	6 Marks
		(OR)		
4		Enumerate and explain in brief the different types of concentrating type collectors.	CO2	14 Marks

UNIT-III

5	a)	Explain in detail about the passive Solar Space heating System.	CO3	10 Marks
	b)	What do you mean by a Solar Energy storage system and how is it broadly classified?	CO3	4 Marks
		(OR)		
6	a)	Explain the different maximum power techniques used along with Solar PV System.	CO3	7 Marks
	b)	Describe the application of solar energy for the solar refrigeration.	CO5	7 Marks

UNIT-IV

7	a)	Discuss on wind energy potential in India and its growth scenario.	CO5	7 Marks
	b)	Explain the main considerations in selecting a site for wind generators.	CO4	7 Marks
		(OR)		
8	a)	Discuss the functioning of a single stage standard rate anaerobic digester.	CO3	10 Marks
	b)	Identify the different biomass energy resources. What is the energy yield from each of them?	CO4	4 Marks

UNIT-V

9	a)	Explain the efforts being done in India for utilizing geothermal energy as an alternative source of energy.	CO6	10 Marks
	b)	What principles guide in the location of a geothermal power station?	CO6	4 Marks
		(OR)		
10		Discuss the theory and working principle of ocean thermal energy conversion system. Also mention its limitations and applications.	CO4	14 Marks

CODE No.: 16BT60304 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January - 2022

GAS TURBINES AND JET PROPULSION
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain Back work Ratio in Gas turbines.	CO1	4 Marks
	b)	The air enters the compressor of an open cycle gas turbine at a constant pressure at 1bar and 20^0C. The pressure of air after compression is 4bar. The isentropic efficiency of compressor and turbine are 80 % and 85 %. The air fuel ratio is 90:1. If the flow rate is 3 kg/sec; i) Evaluate the power developed. ii) Thermal Efficiency of the cycle. C_p=1kJ/kg, C_v= 41800 kJ/kg and γ=1.4.	CO2	10 Marks

(OR)

2.	a)	Illustrate the effect of regeneration on gas turbine power plant with PV and TS diagrams.	CO1	6 Marks
	b)	An Air standard regenerative gas turbine cycle the pressure ratio is 5. Air enters the compressor at 1bar 300K and leaves at 490K. The maximum temperature of the cycle is 1000K. Estimate the cycle efficiency, Given the efficiency of the regenerator and adiabatic efficiency of turbine is 80%. Assume the air ratio for specific heat is 1.4. Show in T-S Chart.	CO2	8 Marks

UNIT-II

3.		A centrifugal compressor running at 7000 r.p.m delivers 500 m^3/min of free air. The air is compressed from 1 bar and 20°C. To a pressure ratio of 4 with an isentropic efficiency of 0.85. Blades are radial at outlet of impeller and the flow velocity of 60 m/s may be assumed constant .The outer radius of the impeller is twice the inner and slip factor may be assume as 0.9. Evaluate the: i) Final temperature of air. ii) The theoretical power. iii) Inner diameter at inlet and outlet. iv) Breadth of the impeller at inlet. v) Impeller blade angle at inlet. vi) Diffuser blade angle at outlet.	CO2	14 Marks

(OR)

4.	a)	Illustrate the working of centrifugal compressor with neat sketch.	CO2	7 Marks
	b)	Explain the how a centrifugal compressor impeller is designed.	CO2	7 Marks

UNIT-III

5.	a)	What are the basic requirements of a combustion chamber? Explain.	CO1	7 Marks
	b)	Explain the process of combustion in gas turbine combustion chambers.	CO3	7 Marks

(OR)

6.		Explain the combustion chamber geometry bringing out the various zones that play a part in the process of combustion with a neat sketch.	CO3	14 Marks

UNIT-IV

7.	a)	Explain the working of Turbo Propulsive Jet engine with neat sketch.	CO1	7 Marks
	b)	Discuss the terms propulsive efficiency and overall efficiency.	CO4	7 Marks

(OR)

8.	a)	Outline the Basic cycle for Turbo Jet engine with TS Chart.	CO1	7 Marks
	b)	What are the advantages and disadvantages of ram jet engine and what are its applications?	CO4	7 Marks

UNIT-V

9.	a)	Draw a schematic diagram of a liquid propellant rocket and explain its working. What are the applications of this type of rocket?	CO1	7 Marks
	b)	Briefly describe the two types of solid propellant rocket.	CO5	7 Marks

(OR)

10.		Draw a schematic diagram of a liquid propellant rocket. What are the different systems of injecting liquid propellant into the combustion chamber?	CO5	14 Marks

CODE No.: 16BT60305 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January - 2022

HYDRAULICS AND PNEUMATICS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	State Pascal's law and explain in details about the application of Pascal's law with neat sketch.	CO1	5 Marks
	b)	Explain with neat sketch of the basic hydraulic system and its Components.	CO2	9 Marks
		(OR)		
2.	a)	Explain the working principle of external Gear pump and Internal Gear pump with neat sketch.	CO1	8 Marks
	b)	Explain the working principle following types of cylinders. i) Single acting cylinder. ii) Double acting cylinder.	CO2	6 Marks

UNIT-II

3.	a)	Explain the construction and working of pilot operated sequence valve.	CO2	7 Marks
	b)	Explain with a neat sketch the working of shuttle valve with symbolic representation.	CO2	7 Marks
		(OR)		
4.	a)	Explain the working principle of following. i) 3/2 way valve. ii) 4/2 way valve. iii) 4/3 way valve.	CO3	8 Marks
	b)	Sketch and explain commonly used 3-position 4-way direction control valves.	CO3	6 Marks

UNIT-III

5.		Sketch and explain construction and principle of operation of a quick exhaust valve.	CO1	14 Marks
		(OR)		
6.	a)	Discuss the working principle of an air compressor.	CO2	7 Marks
	b)	What are flow control valves? Draw graphical symbols of F.C.V.	CO4	7 Marks

UNIT-IV

7.	a)	Discuss in detail the considerations taken while designing pneumatic circuits.	CO3	7 Marks
	b)	Explain with block diagram the components present in a PLC and give their functions.	CO3	7 Marks
		(OR)		

8.	A double acting pneumatic cylinder is required to provide the following operation: Fast extension till the mid stroke, slow extension till the end of stroke and on sensing the stroke end provides rapid return. Develop a pneumatic circuit employing shuttle valve and suitable flow control valves.	CO6	14 Marks

UNIT-V

9.	Explain the working principle of pilot assisted solenoid control of directional control valve with a neat sketch. Illustrate the graphical symbol of the valve.	CO5	14 Marks

(OR)

10.	Briefly explain the use of logic gates in pneumatic applications. Explain with any one practical example.	CO3	14 Marks

CODE No.: 16BT60401 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January - 2022

ANTENNAS AND WAVEGUIDES
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Derive the expressions for the fields in rectangular waveguide in case of Transverse Magnetic (TM) wave.	CO2	7 Marks
	b)	Show that for a TE_{10} mode, a frequency of 6 GHz will pass through the waveguide of dimensions a=1.5cm and b=1cm. If a dielectric with $\varepsilon_r = 4$ is inserted into the waveguide.	CO4	7 Marks

(OR)

2.	a)	Consider a rectangular waveguide with a/b = 2, a = 2.29 cm, $\mu_r = 1$ and ε_r=2.5. Find out the cutoff wavelength, cutoff frequency for TE_{10}, TM_{11} mode.	CO4	7 Marks
	b)	Explain in brief about strip line transmission lines.	CO1	7 Marks

UNIT-II

3.	a)	An infinitesimal electric dipole of constant current Io is placed symmetrically about the origin and directed along z-axis. Derive the: i) Far-zone fields radiated by the dipole. ii) Directivity of the antenna.	CO6	10 Marks
	b)	How many distant point sources can a receiving antenna with directivity D resolve?	CO2	4 Marks

(OR)

4.	a)	Find the transmitter power required to operate a link with identical antennas of 25 dBi separated by 15 KM such that received power is -45 dBm and f = 5.8 GHz.	CO6	7 Marks
	b)	Calculate effective length and effective aperture area of antenna whose radiation resistance is 73Ω.	CO4	7 Marks

UNIT-III

5.	a)	Design a broad side array (array of any length) and develop the expression for null directions of the array.	CO3	8 Marks
	b)	Draw the radiation pattern of 4 - isotropic elements fed in phase, spaced λ/2 apart with the principle of pattern multiplication.	CO3	6 Marks

(OR)

6.	a)	Two isotropic point sources of unequal amplitude and any phase difference are separated by distance 'd'. Derive the expressions for the total field in the direction ϕ at a large distance 'r'.	CO2	7 Marks
	b)	Design a Yagi-Uda array having five elements operating at 250 MHz.	CO3	7 Marks

UNIT-IV

7.	a)	Suggest different feeding techniques of Microstrip patch antenna.	CO5	8 Marks
	b)	What are the advantages and limitations of Microstrip antennas?	CO1	6 Marks

(OR)

8.	a)	Formulate expression for BWFN, HPBW, Directivity and Gain for the large circular aperture with uniform illumination.	CO2	7 Marks
	b)	Describe the construction and basic principle of operation of a helical antenna. i) Normal mode of operation. ii) Axial mode of operation.	CO1	7 Marks

UNIT-V

9.	a)	Discuss a technique to measure the null directions of an antenna.	CO5	8 Marks
	b)	Write short notes on reciprocity in antenna measurements.	CO1	6 Marks

(OR)

10.	a)	Transmitting and receiving antennas operating at 1 GHz with gains of 20 and 15 dB, respectively, are separated by a distance of 1 km. Find the power delivered to the load when the input power is 150 W.	CO6	6 Marks
	b)	Apply gain transfer method for measuring gain of an antenna.	CO5	8 Marks

CODE No.: 16BT60402 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

DIGITAL SIGNAL PROCESSING
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Classify discrete time systems with examples.	CO2	7 Marks
	b)	State and prove any two properties of DTFT.	CO2	7 Marks

(OR)

2.	a)	Explain the significance of frequency domain representation of discrete time signals and system.	CO4	7 Marks
	b)	Solve the difference equation $y(n) = x(n) + \frac{5}{6}y(n-1) - \frac{1}{6}y(n-2)$ for the input sequence $x(n) = \begin{cases} 3^n & n \geq 0 \\ 0 & n < 0 \end{cases}$. Assume that initial condition $y(n) = 0$ for $n < 0$.	CO2	7 Marks

UNIT-II

3.	a)	Synthesize $x(n)$ of $X(K) = \{4, 2, 0, 4\}$ using IDFT.	CO4	7 Marks
	b)	Derive and sketch the structure of Decimation in Frequency FFT algorithm for $N = 8$.	CO3	7 Marks

(OR)

4.	a)	What is DFT? Interpret role of DFT over the DTFT.	CO4	7 Marks
	b)	Derive and sketch the structure of decimation in time FFT algorithm for N = 8.	CO3	7 Marks

UNIT-III

5.	a)	Discuss transpose form of second order IIR system realizations.	CO2	7 Marks
	b)	Convert the following analog filter transfer function Bilinear Transformation method. $H(s) = 1/(s + 0.2)$ Consider T = 1 Sec.	CO4	7 Marks

(OR)

6.	a)	Design a digital butterworth filter using bilinear transformation. The specifications of the desired LP filter is $0.9 \leq \lvert H(\omega)\rvert \leq 1; \quad 0 \leq \omega \leq \frac{\pi}{2}$ $\lvert H(\omega)\rvert \leq 0.2; \; 3\frac{\pi}{2} \leq \omega \leq \frac{\pi}{2}$	CO3	7 Marks
	b)	Compare the characteristics of butter worth and chebyshev approximations.	CO2	7 Marks

UNIT-IV

7.	a)	Realization of the following system with minimum number of multipliers. $$H(z) = 1 + \frac{1}{3}z^{-1} + \frac{1}{4}z^{-2} + \frac{1}{4}z^{-3} + \frac{1}{3}z^{-4} + z^{-5}$$	CO4	7 Marks
	b)	Apply windowing technique to design a linear phase FIR highpass filter using hamming window with cut off frequency $Wc = 0.8\pi$ rad/sample and N = 7.	CO5	7 Marks

(OR)

8.	a)	Discuss the different realizations of FIR filter.	CO1	7 Marks
	b)	Design a linear phase FIR bandpass filter to pass frequencies in the range 0.4π to 0.6π rad/sample by taking 7 samples of hamming window.	CO5	7 Marks

UNIT-V

9.	a)	Why the P-DSPs have multiple address and data buses for internal memory and peripherals but have only a single address and data bus for external memory and peripherals? Give the reasons.	CO2	7 Marks
	b)	Discuss in detailed about pipelining of instruction execution in DSP processor.	CO1	7 Marks

(OR)

10.	a)	Discuss the modified bus structures and memory access schemes with supporting block diagrams.	CO1	7 Marks
	b)	Why MAC operations is implemented in hardware? Explain.	CO2	7 Marks

CODE No.: 16BT60404 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January - 2022

IMAGE PROCESSING

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Draw the Block diagram of Image Processing System and explain each block in detail.	CO1	8 Marks
	b)	Analyze the Performance of Haar Transform with kernel.	CO2	6 Marks
		(OR)		
2.	a)	Write the Properties of : i) Slant Transform. ii) KL Transform.	CO1	4 Marks
	b)	Derive the kernel for $N = 4$ using Discrete Cosine Transform.	CO3	10 Marks
		UNIT-II		
3.	a)	How Histogram Equalization is used in Modern Digital Image Processing.	CO6	7 Marks
	b)	Apply various techniques in image Sharpening and explain in brief.	CO5	7 Marks
		(OR)		
4.	a)	What are the techniques used in image processing to remove blurring in an image?	CO5	7 Marks
	b)	What are the applications of image enhancement in the society?	CO6	7 Marks
		UNIT-III		
5.	a)	Write a brief notes on Weiner Filtering?	CO1	7 Marks
	b)	Differentiate between enhancement and restoration processes. Present the restoration technique employing inverse filter.	CO2	7 Marks
		(OR)		
6.	a)	Design additive and multiplicative noise models.	CO1	7 Marks
	b)	Briefly explain the approach of inverse filtering method used for image restoration.	CO2	7 Marks
		UNIT-IV		
7.	a)	Write notes on image compression standards.	CO1	7 Marks
	b)	Develop an algorithm for 'Huffman coding' to compress an image.	CO3	7 Marks
		(OR)		
8.	a)	What is meant by Error-free compression? Discuss about variable-length coding and Token based coding.	CO1	7 Marks
	b)	What is the algorithm used in Arithmetic coding? Explain with an example.	CO3	7 Marks
		UNIT-V		
9.	a)	Explain RGB color model using Cartesian coordinate system with supporting diagram.	CO1	7 Marks
	b)	Identify various color models used in the digital representation of a color image.	CO4	7 Marks
		(OR)		
10.	a)	Write a short notes on: i) Color models. ii) Color image segmentation.	CO1	8 Marks
	b)	Suggest an operator to perform edge detection in 2-D and explain its significance.	CO4	6 Marks

❀ ❀ ❀

CODE No.: 16BT60406 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January - 2022

TELECOMMUNICATION SWITCHING SYSTEMS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Summarize the block diagram of Elements of telecommunication systems.	CO1	7 Marks
	b)	Appraise the Principles of cross bar switching of telecommunication systems.	CO2	7 Marks
		(OR)		
2.	a)	Elaborate Time multiplexed time switching with the help of neat sketch.	CO1	7 Marks
	b)	Contrast the Classifications of switching systems.	CO2	7 Marks

UNIT-II

3.	a)	Estimate the need of Switching hierarchy and routing and also discuss the environmental issues pertaining to routing.	CO5	9 Marks
	b)	Examine the necessity of Numbering plan and charging plan.	CO6	5 Marks
		(OR)		
4.	a)	Assess the charging plan for telecommunication services.	CO5	7 Marks
	b)	Examine the necessity of Numbering plan and charging plan.	CO6	7 Marks

UNIT-III

5.	a)	A subscriber loop of 18km is to be supported from an exchange that uses a 40 V battery with a 400 short-circuit protection resistance. Electronic telephones are used as the subscriber instruments. Determine the wire gauge that needs to be used.	CO3	7 Marks
	b)	What are the advantages of common channel signalling over in channel signalling?	CO2	7 Marks
		(OR)		
6.	a)	During the busy hours, 1200 calls were offered to a group of trunks and six calls were lost. The average calls duration was 3 minutes find: i) The traffic offered. ii) The traffic carried. iii) The traffic lost. iv) The grade of service. v) The total duration of periods of congestion.	CO3	7 Marks
	b)	Distinguish Channel associated and channel non associated signalling.	CO2	7 Marks

UNIT-IV

7.	a)	Generalize ISDN standards and appraise in detail about Broadband ISDN.	CO6	7 Marks
	b)	Explain the Various switching techniques used for data transmission in PSTN.	CO4	7 Marks
		(OR)		
8.	a)	Elaborate basic rate and primary rate access to ISDN.	CO6	7 Marks
	b)	Name some services provided by ISDN and explain in detail.	CO4	7 Marks

UNIT-V

9.	a)	Discuss the functions of each SONET layer.	CO1	4 Marks
	b)	Discuss features of HFC Networks and explain in detail.	CO2	10 Marks
		(OR)		
10.	a)	Summarize the features of HFC Networks.	CO1	7 Marks
	b)	How does ADSL divide the band width of a twisted pair cable?	CO2	7 Marks

CODE No.: 16BT60408 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

INFORMATION THEORY AND CODING

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

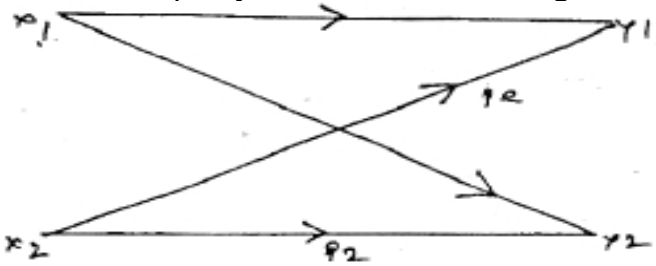
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

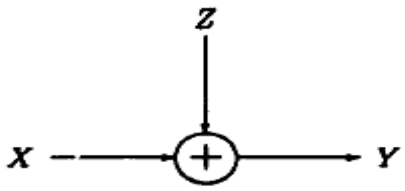
1.	a)	Explain source coding theorem and develop equation for efficiency.	CO1	7 Marks
	b)	A discrete source generates independent symbols with probabilities 0.2, 0.25, 0.15, 0.15, 0.15 and 0.1. Determine the entropy of the source.	CO4	7 Marks
		(OR)		
2.	a)	List out the properties of Entropy.	CO1	7 Marks
	b)	Apply Shano-Fano coding procedure for the following message ensemble. Find entropy and efficiency. Take $M = 2$. $[X] = [x_1, x_2, x_3, x_4, x_5, x_6, x_7]$; $[P] = [0.4, 0.2, 0.12, 0.08, 0.08, 0.08, 0.04]$.	CO4	7 Marks

UNIT-II

3.	a)	Compute the channel capacity of the BSC shown in figure	CO2	7 Marks



	b)	Derive the channel capacity for Water filling channel.	CO5	7 Marks
		(OR)		
4.	a)	Compute the channel capacity of the following discrete memoryless channel:	CO5	8 Marks



Where $Pr\{Z = 0) = Pr\{Z = \alpha\} = 1/2$. The alphabet for x is $X = \{0, 1\}$ Assume that Z is independent of X.

	b)	Describe the tradeoff between bandwidth and signal to noise ratio using Shannon-Hartley theorem.	CO1	6 Marks

UNIT-III

5.		Design the decoder circuit diagram for (n, k) linear block code.	CO3	14 Marks
		(OR)		
6.		The parity check matrix of a particular (6, 3) block code is given as: H = [1 0 1 1 0 0 1 1 0 0 1 0 0 1 1 0 0 1]	CO3	14 Marks

i) Calculate all code words.
ii) Find the min. Distance between the code word.
iii) How many errors can be detected and corrected.
iv) Draw encoder diagram.
v) Suppose that the received code word is 110110, decode this code word.

UNIT-IV

7.	a)	Write about Viterbi algorithm and its applications.	CO6	7 Marks
	b)	Explain the sequential decoding algorithm with an example.	CO1	7 Marks

(OR)

8.	a)	Discuss some of Practical applications of Convolution codes.	CO6	7 Marks
	b)	The generator polynomial of a (7, 4) cyclic code is $g(x) = 1 + x + x^3$. Obtain all the code vectors for the code in non-systematic and systematic form.	CO4	7 Marks

UNIT-V

9.		Explain about types of concatenated codes with block diagram.	CO1	14 Marks

(OR)

10.		Design a (7, 3) RS decoder for a receiving vector R = 10000110111110101101111.	CO3	14 Marks

CODE No.: 16BT60409 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

LIGHT WAVE COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks

UNIT-I

1.	a)	Determine the normalized frequency at 820nm for a step index fiber having a 25μm x 5m core radius, $n_1 = 1.48$ and $n_2 = 1.46$. i) How many modes propagate in this fiber at 820nm? ii) What percent of the optical power flows in the cladding?	CO4	5 Marks
	b)	Explain in detail about Materials used in fabrication of Optical fibers.	CO1	9 Marks

(OR)

2.	a)	A light wave is travelling in a semiconductor medium (GaAs) of refractive index 3.6. It is incident on a different semiconductor medium (AlGaAs) of refractive index 3.4 and the angle of incidence is 80^0. Conclude whether this can result in Total Internal Reflection.	CO4	6 Marks
	b)	Sketch and explain optical fiber structure.	CO1	8 Marks

UNIT-II

3.	a)	Find the radius of curvature R at which the number of modes decreases by 50% in a graded index fiber. For this fiber consider $\alpha=2$, $n_2=1.5$, $\Delta=0.01$, $a=25\mu m$ and wavelength of guided light is 1.3μm.	CO4	7 Marks
	b)	Two step index fibers exhibit the following parameters: (i) a multimode fiber with a core refractive index of 1.500, a relative refractive index difference of 3% and an operating wavelength of 0.82 μm; (ii) an 8 μm core diameter single-mode fiber with a core refractive index the same as (i), a relative refractive index difference of 0.3% and an operating wavelength of 1.55 μm. Estimate the critical radius of curvature at which large bending losses occur in both cases.	CO4	7 Marks

(OR)

4.	a)	A 6 km optical link consists of multimode step index fiber with a core refractive index of 1.5 and a relative refractive index difference of 1%. Estimate: (i) the delay difference between the slowest and fastest modes at the fiber output (ii) the **rms** pulse broadening due to intermodal dispersion on the link (iii) the maximum bit rate that may be obtained without substantial errors on the link assuming only intermodal dispersion (iv) the bandwidth–length product corresponding to (iii).	CO4	7 Marks
	b)	A 30 km long fiber at 1300 nm has an attenuation of 0.8dB/km. If 200μm power is launched into the fiber, find the output power in dBm and in watts.	CO4	7 Marks

UNIT-III

5.	a)	Develop an expression for Noise generated due to Avalanche Multiplication.	CO3	7 Marks
	b)	Discuss the LASER Diode Principle, modes and threshold conditions.	CO1	7 Marks

(OR)

6.	a)	If at the half power point $\lambda - \lambda_0$=2nm, design the spectral width σ of GaAs laser operating at 850nm. It has a 500μm length and a refractive index n=3.7. Also find the frequency and wavelength spacings.	CO3	6 Marks
	b)	Explain with relevant diagrams the basic principle of confinement of carriers optical power in the active region of double hetero junction LED.	CO1	8 Marks

UNIT-IV

7.	a)	Formulate the expressions for the maximum power coupled into a step index and graded index fibers.	CO2	8 Marks
	b)	Define Radiance. Illustrate the source output patterns.	CO1	6 Marks

(OR)

8.	a)	Derive an expression for calculating the amount of power coupling in to fiber from the optical source.	CO2	10 Marks
	b)	List the factors affecting the amount of power coupled into fiber from optical source.	CO1	4 Marks

UNIT-V

9.	a)	Suggest an analysis mechanism to determine the dispersion limitation of an optical fiber link.	CO5	7 Marks
	b)	List and explain the various Deployment Techniques for Optical Networks.	CO1	7 Marks

(OR)

10.	a)	Model power penalties in digital links.	CO5	6 Marks
	b)	Identify and justify the transmission modes suited for Optical Networks.	CO2	8 Marks

CODE No.: 16BT60501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

SOFTWARE TESTING
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Explain Software Testing Model with neat diagram.	CO1	8 Marks
	b)	Explain Software Testing as process. Justify?	CO2	6 Marks
		(OR)		
2.	a)	Define STLC and explain each step in detail.	CO1	8 Marks
	b)	Compare Positive and Negative testing.	CO2	6 Marks
		UNIT-II		
3.	a)	Distinguish between decision node and junction node.	CO2	7 Marks
	b)	Discuss about Cyclomatic Complexity in path testing.	CO3	7 Marks
		(OR)		
4.	a)	Explain data flow testing in detail.	CO1	6 Marks
	b)	Write a program to display the prime numbers up to a given number. Draw the control flow graph and calculate the cyclomatic complexity number for the given program.	CO4	8 Marks
		UNIT-III		
5.	a)	List and explain the elements of state testing.	CO1	7 Marks
	b)	Identify the possible states, inputs of a software process and draw its corresponding state table.	CO2	7 Marks
		(OR)		
6.	a)	Describe the need of state table. Explain the process of converting state table into test cases.	CO3	7 Marks
	b)	"Error Guessing is an ad hoc approach for testing". Comment on this statement.	CO1	7 Marks
		UNIT-IV		
7.	a)	Discuss the key components of test management.	CO1	7 Marks
	b)	List and explain the major activities of a testing group.	CO2	7 Marks
		(OR)		
8.	a)	List the differences between size oriented metrics and function point analysis metrics.	CO2	7 Marks
	b)	Explain the process of calculating function points of real time software.	CO4	7 Marks
		UNIT-V		
9.	a)	Identify the different parameters required for evaluating regression test selection techniques.	CO2	7 Marks
	b)	T contains 90 tests of which 20 are modification-revealing for P and P' and M selects 12 of these 20 tests, then calculate the inclusiveness of M relative to P, P' and T.	CO4	7 Marks
		(OR)		
10.	a)	Apply any regression testing tool and perform testing on login screen of gmail application.	CO5	7 Marks
	b)	Use any testing tool and insert standard checkpoints for flight application.	CO5	7 Marks

❀ ❀ ❀

CODE No.: 16BT60502 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, January 2022

SOFT COMPUTING

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	State the terminologies of Artificial Neural Networks like weights, Bias, Theshold, Learningrate, Momentum factor and Vigilance Parameter.	CO1	7 Marks
	b)	Compare contrast biological neuron and artificial neuron.	CO1	7 Marks
		(OR)		
2.	a)	Implement OR function using Hebb network (consider bipolar inputs and targets).	CO5	7 Marks
	b)	With a flowchart explain the Hebb training algorithm.	CO3	7 Marks

UNIT-II

3.	a)	Find the weights required to perform the following classification using perceptron network. The vectors (1,1,1,1) and (-1,1,-1,1) are belonging to class(have target value 1), vectors(1,1,-1) and(1,-1,-1,1) are not belonging to the class so have target value -1.Assume learning rare as 1 and initial weight as 0.	CO5	10 Marks
	b)	Design the architecture of perceptron network.	CO1	4 Marks
		(OR)		
4.	a)	Discuss the importance of Perceptron network testing algorithm.	CO2	7 Marks
	b)	List the Perceptron learning rule.	CO1	7 Marks

UNIT-III

5.		Build aKohonen self-organizing map to cluster four given vectors, [0 0 1 1], [1 0 0 0], [0 1 1 0] and [0 0 0 1].The number of clusters to be formed is two. Assume an initial learning rate of 0.5.	CO6	14 Marks
		(OR)		
6.	a)	Build a counter_propagation network for approximating the functions: $f(x) = 1/x$ $f(x) = 7x^2$	CO6	8 Marks
	b)	Differentiate fast learning and slow learning.	CO2	6 Marks

UNIT-IV

7.	a)	Outline the importance of fuzzy sets.	CO1	6 Marks
	b)	Justify the following statement: "Partial membership is allowed in fuzzy sets.	CO1	8 Marks
		(OR)		
8.	a)	Design the fuzzy sets operations using Venn Diagram.	CO3	7 Marks
	b)	Compare and contrast classical logic and fuzzy logic.	CO4	7 Marks

UNIT-V

9.	a)	Determine image and inverse for the following interval $\underline{A} = [5, 3]$.	CO4	7 Marks
	b)	Mention the properties of performing addition and multiplication on intervals.	CO1	7 Marks
		(OR)		
10.	a)	With a neat flowchart, explain the operation of a simple genetic algorithm.	CO1	8 Marks
	b)	State the importance of genetic algorithm.	CO1	6 Marks

❀ ❀ ❀

CODE No.: 16BT60503 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, January 2022

WIRELESS NETWORKS
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Draw and explain working principle of 3G systems.	CO1	10 Marks
	b)	Using QPSK modulation and convolution coding, the IS-95 digital cellular systems require 3dB < S_r < 9dB. The bandwidth of the channel is 1.25 MHz, and the transmission rate is R = 9600bps. Find the capacity of a single IS-95 cell.	CO5	4 Marks
		(OR)		
2.	a)	With neat sketch explain the CDMA systems.	CO1	10 Marks
	b)	Discuss about Near-Far problem in FDMA.	CO1	4 Marks

UNIT-II

3.	a)	Discuss about Ad Hoc and Infrastructure topology.	CO1	10 Marks
	b)	Why band splitting is not used in 2G cellular networks.	CO2	4 Marks
		(OR)		
4.	a)	How to increase the capacity of an analog cellular system without increasing the number of antenna sites?	CO2	7 Marks
	b)	Describe in detail about cellular hierarchy.	CO3	7 Marks

UNIT-III

5.	a)	Design the DFIR packet format specification.	CO3	8 Marks
	b)	Explain the MAC frame control field.	CO1	6 Marks
		(OR)		
6.	a)	What is the 802.11 MAC frames that has the type frame control code of 001000?	CO1	10 Marks
	b)	Identify the transmission techniques of WLAN standards.	CO3	4 Marks

UNIT-IV

7.	a)	Compare Soft and Hard handoffs.	CO2	8 Marks
	b)	With neat sketch explain the reverse traffic channel processing.	CO1	6 Marks
		(OR)		
8.	a)	How GPRS does provides variety of data rates.	CO2	6 Marks
	b)	Build the Reference architecture of GPRS.	CO6	8 Marks

UNIT-V

9.	a)	Identify the Protocol entities on WATM network.	CO4	10 Marks
	b)	Describe about mobility support of WATM.	CO1	4 Marks
		(OR)		
10.	a)	Draw and explain the topologies in the HIPERLAN-2	CO1	8 Marks
	b)	Differentiate between IEEE 802.11a and HIPERLAN-2.	CO2	6 Marks

CODE No.: 16BT61001 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January - 2022

ARM PROCESSORS AND PIC MICROCONTROLEERS
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Using the instruction set reference sheets, write an ALP to move a 8 byte block of data from 100H to destination starting at 200H. CO4 8 Marks

   b) Analyze the following program and write the contents of registers, Ports, and corresponding memory location value in those locations accordingly step by step. CO2 6 Marks

```
MOVLB   0x4
MOVLW   H'00'
MOVWF   TRISB
MOVLW   0x66
IORLW   36H
BCF     PORTB,1
MOVWF   PORTB
BSF     PORTB,3
MOVWF   PORTB
MOVF    40H,1
RRNCF   40H,1,1
```

(OR)

2. a) Write an ALP to perform the following. CO4 6 Marks

   If(N_1Bit0 == 1)
   {N_2Bit3 = 0}
   else if {N_1Bit6 == 0}
   {N_3Bit4 = 1}.

   Assume N_2 = 10100101, N_3 = 11110000, N_1 = 11001100 being in locations of data RAM. For additional information use the Instruction set provided for reference.

   b) List the basic elements and registers of a PIC 18 microcontroller and explain their functionality. CO1 8 Marks

UNIT-II

3. a) Explain the timer structure in 8-Bit mode using suitable example program. CO1 7 Marks

   b) Write a program in assembly or C to read Port B and transmit the same serially and also on Port A using interrupts with clock frequency of 10 MHz and baud rate of 9600. For additional information refer to Register file summary provided for reference. CO5 7 Marks

(OR)

4.	a)	Select appropriate clock frequency and timer in required mode, write a program in assembly or C to generate a square wave on Port A Pin 3 using timer with a duty cycle of 30% with and without interrupt.	CO5	8 Marks
	b)	Explain the different registers used for serial communication.	CO1	6 Marks

UNIT-III

5.		Design an interfacing circuit and program to read keypad and convert to an ASCII value.	CO3	14 Marks

(OR)

6.	a)	Calculate the memory required and the time it takes to execute any one of the program given in this paper. Use the instruction set summary provided as reference.	CO6	7 Marks
	b)	Write a program to rotate the stepper motor by an angle of 306º. Assume step size of 1.8º.	CO4	7 Marks

UNIT-IV

7.	a)	Draw the block diagram of cortex M3 and explain the different units.	CO1	9 Marks
	b)	Present the history of ARM processors and their applications.	CO2	5 Marks

(OR)

8.	a)	Explain the different registers of ARM cortex M3 in exception modes.	CO2	8 Marks
	b)	Explain the basic structure of memory system of ARM cortex M3 using a suitable diagram.	CO1	6 Marks

UNIT-V

9.	a)	Show how ARM provides features to control the updation of flags and conditional execution of instructions using suitable examples. Show the example for cases where flags are updated, and when not updated. Also case when instructions get executed, and when skipped.	CO1	6 Marks
	b)	Write an ALP to perform addition of two numbers in arm mode and then switch to thumb mode to perform subtraction.	CO4	8 Marks

(OR)

10.	a)	Demonstrate the use of the following instructions using suitable example. Stack operations - Full decrement, Full increment, Empty decrement and Empty increment with suitable example.	CO1	8 Marks
	b)	Demonstrate how a arm mode is beneficial as compared to thumb mode using suitable examples.	CO2	6 Marks

CODE No.: 16BT61002 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

PROCESS CONTROL INSTRUMENATION
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What are the process elements? Explain each.	CO1	7 Marks
	b)	Determine the transfer function of a single tank liquid level system.	CO2	7 Marks

(OR)

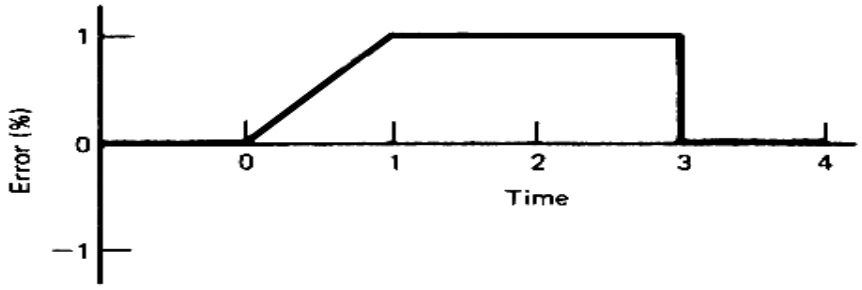
2.	a)	Evaluate the transfer function of two single tanks liquid level systems are connected in interacting.	CO2	10 Marks
	b)	Explain servo problem with an example.	CO1	4 Marks

UNIT-II

3.	a)	Explain the working of Electronic PID controller with a neat diagram.	CO1	7 Marks
	b)	Explain the working of Pneumatic proportional integral controller with neat diagram.	CO1	7 Marks

(OR)

4.	a)	Plot a graph of a PI controller output as s function of time for given error signal shown in figure. Assume that the Proportional gain $K_p = 5$, Integral gain $K_I = 0.1\text{sec}^{-1}$ and $p_I(0) = 20\%$.	CO3	8Marks



	b)	Explain the working of Pneumatic proportional integral Derivative controller with neat diagram.	CO1	6 Marks

UNIT-III

5.	a)	What is meant by controller tuning?	CO1	7 Marks
	b)	Discuss the two classes of dynamic performance criteria. Give physical examples and demonstrate how different criteria lead to different controller design.	CO1	7 Marks

(OR)

6.	a)	What are the relative advantages and disadvantages of time integral criteria ISE, IAE and ITAE? How would you select the most appropriate for a particular application?	CO1	7 Marks
	b)	"Time integral criteria lead to unique solution to determine the controller parameters". Justify.	CO1	7 Marks

UNIT-IV

7.	a)	What is an actuator? List the types of pneumatic actuators.	CO1	6 Marks
	b)	Identify the appropriate control valve used for the fluids contacting solid matter. Explain it with a neat diagram.	CO6	8 Marks

(OR)

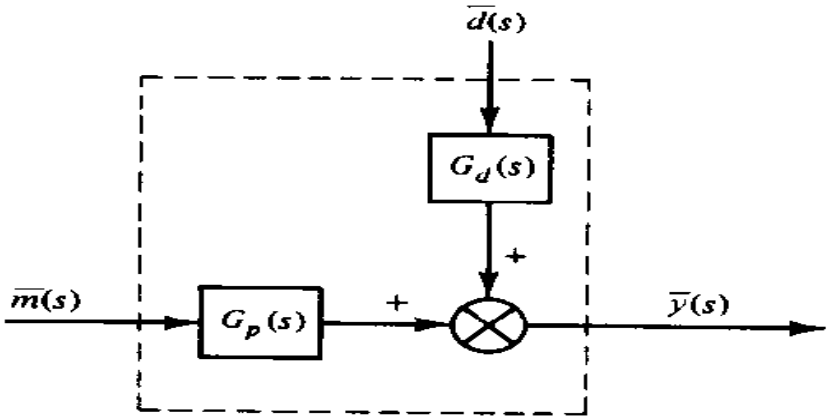
8.	a)	Write an importance of a valve positioner.	CO1	7 Marks
	b)	Identify the appropriate control valve with one port opening and one seat plug. Explain it with a neat diagram.	CO5	7 Marks

UNIT-V

9.	a)	List the applications of cascade control system. Explain any one with neat diagram.	CO6	7 Marks
	b)	Consider a process with one controlled output and two active manipulated variables. Under what conditions could you use both manipulated variables to control the single output?	CO6	7 Marks

(OR)

10.	a)	Compare the cascade control and signal loop control systems.	CO1	4 Marks
	b)	Design the feed forward controller of a given process.	CO3	10 Marks



CODE No.: 16BT61005 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January - 2022

OPTO-ELECTRONICS AND LASER INSTRUMENTATION
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the operation of step index and graded index multimode fibers in detail.	CO1	7 Marks
	b)	Explain the historical development of optical fibers with the help of Electromagnetic spectrum.	CO1	7 Marks
		(OR)		
2.	a)	Differentiate PIN photodiode and avalanche photodiode with respect to construction and working.	CO2	7 Marks
	b)	List the optical parameters of optical fiber and derive expression for Numerical Aperture.	CO1	7 Marks

UNIT-II

3.	a)	"Polarization maintaining fibers have linear polarization state". Justify it	CO2	4 Marks
	b)	Compare intensity modulated sensor and interferometric fiber optic sensor with examples.	CO2	10 Marks
		(OR)		
4.	a)	Design an optical fiber sensor for liquid level measurement.	CO3	7 Marks
	b)	Describe the real time applications of fiber for acceleration measurement.	CO4	7 Marks

UNIT-III

5.	a)	State the properties of laser and explain each in detail.	CO1	4 Marks
	b)	With the aid of energy band diagram, explain He-Ne laser in detail.	CO1	10 Marks
		(OR)		
6.	a)	Explain mode locking which gives an engineering solution for the lasers in the medical fields.	CO6	7 Marks
	b)	Design a solid state laser system which uses ruby rod as source and electrical pumping mechanism.	CO3	7 Marks

UNIT-IV

7.	a)	With neat sketch, explain Lasers in diagnostics in detail.	CO1	7 Marks
	b)	Discuss the usage of advanced lasers in material processing applications	CO5	7 Marks
		(OR)		
8.	a)	Define endoscopy. Specify the requirements of laser endoscopy and design a laser setup to perform laser endoscopy.	CO3	7 Marks
	b)	Explain the principle and working of lasers in photo medicine.	CO1	7 Marks

UNIT-V

9.	a)	Specify the importance of optical modulators in industries; differentiate acousto-optic effect and pockel's effect.	CO2	10 Marks
	b)	Examine and differentiate photography and holography.	CO1	4 Marks
		(OR)		
10.	a)	Explain the process of 3-D image construction and reconstruction with neat sketch.	CO1	10 Marks
	b)	Enumerate different applications of holography.	CO1	4 Marks

CODE No.: 16BT61006 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

AIRCRAFT INSTRUMENTATION
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Give a brief account on primary control surfaces in an aircraft.	CO1	7 Marks
	b)	What are the secondary control surfaces and their functionalities?	CO1	7 Marks
		(OR)		
2.	a)	Discuss the three forces and moments experienced by an aircraft.	CO1	7 Marks
	b)	Define the angle-of-attack. Differentiate between angle of attack and pitch angle.	CO2	7 Marks

UNIT-II

3.		Explain with a diagram, how the combined pitot-static tube is used to measure the total, static and dynamic pressures in an aircraft.	CO5	14 Marks
		(OR)		
4.		Discuss about atmospheric variations with altitude.	CO2	14 Marks

UNIT-III

5.		Analyze the principle and working of Ring laser gyros with a neat sketch.	CO3	14 Marks
		(OR)		
6.		How does a gyro horizon work, explain with a diagram and draw different flight altitude displays?	CO2	14 Marks

UNIT-IV

7.	a)	Calculate the horse power if the speed of an engine is 1600 RPM and torque is 3000 Ft-lbs.	CO4	4 Marks
	b)	Discuss the various methods of measuring the engine's shaft speed.	CO5	10 Marks
		(OR)		
8.	a)	Calculate the horse power if the speed of an engine is 1520 RPM and torque is 3100 Ft-lbs.	CO4	4 Marks
	b)	Describe with an appropriate diagram the operation of shaft-speed measurement using a suitable instrument.	CO5	10 Marks

UNIT-V

9.		Draw the dial of horizontal situation indicator and explain the different of HIS display.	CO1	14 Marks
		(OR)		
10.		With suitable diagrams, explain Flight director system.	CO1	14 Marks

CODE No.: 16BT61041 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, January 2022

PROGRAMMABLE LOGIC CONTROLLERS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	List and describe the various types of solid-state memory used in a PLC CPU.	CO1	7 Marks
	b)	Write major steps in creating a PLC program for an industrial automation.	CO1	7 Marks
		(OR)		
2.		Design a ladder logic diagram for spray process system.	CO3	14 Marks

UNIT-II

3.	a)	Describe about input group registers scheme with neat diagram.	CO1	7 Marks
	b)	Apply PLC counter for the control of Dual control application this circuit would monitor the proper counts.	CO2	7 Marks
		(OR)		
4.	a)	Illustrate output group registers scheme with neat diagram.	CO1	7 Marks
	b)	There are three mixing devices on a processing line: A, B and C. After the process begins, mixer A is start after 7 seconds elapse. Next mixer b is to start 3.6 seconds after A. All then remain on until a master enable switch is turned off. Construct a ladder diagram to accomplish this operation.	CO4	7 Marks

UNIT-III

5.	a)	Illustrate a process requiring a jump with nonreturn instruction and draw the ladder logic diagram.	CO1	7 Marks
	b)	Describe SWEEP function and its application.	CO1	7 Marks
		(OR)		
6.	a)	Examine process requiring a jump with return instruction and draw the ladder logic diagram.	CO2	7 Marks
	b)	Describe the CLEAR function and its application.	CO1	7 Marks

UNIT-IV

7.		Develop to automate the paint spray process after a certain process count is reached. After a count of 15 from a sensor, a paint spray is to run for 25 seconds.	CO6	14 Marks
		(OR)		
8.	a)	Explain how PLC matrix functions help to reduce the program length.	CO1	7 Marks
	b)	Compare the different functions available in PLC for changing a REGISTER BIT STATUS? Explain each of them.	CO2	7 Marks

UNIT-V

9.	a)	Explain how the FORCE mode is used for PLC program testing and analysis.	CO1	7 Marks
	b)	Compare discrete and analog operation of a PLC.	CO2	7 Marks

(OR)

10.	a)	Interpret the data flow and number conversions involved in PLC analog operation.	CO1	7 Marks
	b)	Name one application each for which a mini PLC may be appropriate. Provide Justifications for your choice.	CO5	7 Marks

CODE No.: 16BT61201 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

CLOUD COMPUTNG

[Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What is purpose of Virtualization? Explain characteristics and benefits of Virtualization.	CO1	7 Marks
	b)	Explain Pros and Cons of Virtualization Technology.	CO1	7 Marks
		(OR)		
2.		Explain features and services of Hyper-V Virtualization Technology.	CO1	14 Marks

UNIT-II

3.	a)	What is Cloud Computing? Explain different types of services in cloud computing with suitable examples.	CO1	7 Marks
	b)	Compare and contrast benefits of Cloud Computing.	CO2	7 Marks
		(OR)		
4.	a)	Explain various components of Cloud Computing Architecture.	CO1	7 Marks
	b)	Categorize Infrastructural Models of Cloud Computing.	CO2	7 Marks

UNIT-III

5.		Analyze various clouds of Data Center Technologies.	CO2	14 Marks
		(OR)		
6.		Outline various features and services of Capacity Planning in Cloud.	CO1	14 Marks

UNIT-IV

7.	a)	Distinguish between IaaS *vs.* SaaS.	CO2	7 Marks
	b)	Develop a SaaS based cloud e-Ticket application using Salesforce.com cloud.	CO4, CO6	7 Marks
		(OR)		
8.		Discuss various recovery methods for Cloud Disaster applications.	CO1	14 Marks

UNIT-V

9.		Create employee web home page using Google App Engine Cloud.	CO5	14 Marks
		(OR)		
10.		Develop and list various steps to create bucket with 4GB storage space using Amazon EC2 Cloud.	CO3	14 Marks

CODE No.: 16BT61202 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, January 2022

AD-HOC AND WIRELESS SENSOR NETWORKS
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Identify and illustrate some of the important issues in pricing for multi-hop wireless communication.	CO3	7 Marks
	b)	Explain a common method used in alleviating the hidden terminal problem at the MAC layer.	CO1	7 Marks
		(OR)		
2.	a)	List out the goals to be met while designing a medium access control (MAC) protocol for Ad-hoc wireless networks.	CO1	7 Marks
	b)	Explain about MACAW (A Media Access Protocol for Wireless LANs).	CO1	7 Marks

UNIT-II

3.	a)	Classify the routing protocols for Ad-hoc wireless networks.	CO2	4 Marks
	b)	Explain how route establishment and route maintenance takes place in destination sequenced distance-vector routing protocol (DSDV).	CO1	10 Marks
		(OR)		
4.	a)	Identify some of the key issues involved in QoS routing in Ad-hoc networks.	CO3	6 Marks
	b)	Explain about Dynamic source routing protocol (DSR).	CO1	8 Marks

UNIT-III

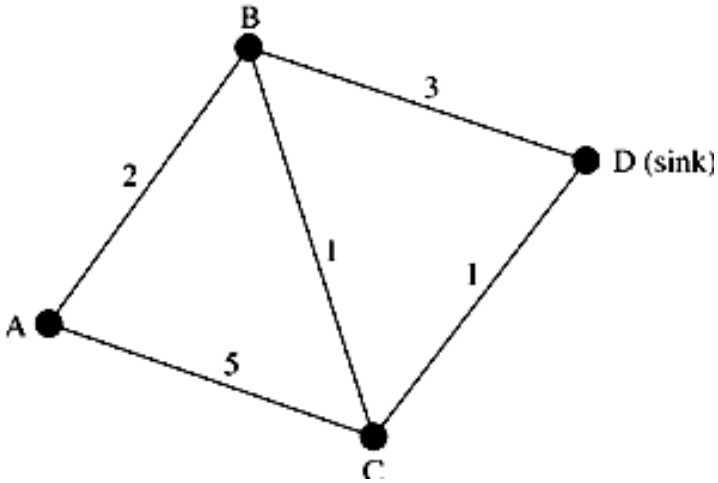
5.		List the issues and challenges that TCP experiences when used in Ad-hoc wireless networks.	CO1	14 Marks
		(OR)		
6.	a)	Assume that when the current size of the congestion window is 48 KB, the TCP sender experiences a timeout. What will be the congestion window size if the next three transmission bursts are successful? Assume that MSS is 1 KB. Consider (i) TCP Tahoe and (ii) TCP Reno.	CO2, CO3	8 Marks
	b)	Discuss the issues to be considered while designing a transport layer protocol for Ad-hoc wireless networks.	CO1	6 Marks

UNIT-IV

7.	a)	Outline The Classification of Energy Management Schemes.	CO5	7 Marks
	b)	Explain in detail about Heterogeneous battery-scheduling technique**.**	CO1	7 Marks
		(OR)		
8.	a)	Illustrate power-aware techniques handled at the TCP/IP and the application layers of the protocol stack.	CO3	7 Marks
	b)	Explain Network layer -Power-Saving Localized Routing (SP-Power) Algorithm.	CO1	7 Marks

UNIT-V

9.	a)	List out the applications of sensor networks.	CO1	6 Marks
	b)	Consider the network topology shown in Figure below. The numbers on the edges indicate the cost of the particular hop. Show the step-wise working of the cost-field approach to determine optimal paths, if the sink is *D*.	CO3, CO5	8 Marks



(OR)

10.	a)	Compare wireless ad-hoc and sensor networks.	CO2	7 Marks
	b)	List out the Issues and Challenges in Designing a Sensor Network.	CO1	7 Marks

CODE No.: 16BT61205 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January – 2022

CYBER SECURITY AND LAWS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Categorize cyber criminals and explain.	CO2	7 Marks
	b)	State the Indian legal perspective on cyber crimes.	CO1	7 Marks
		(OR)		
2.	a)	Categorize the Cyber laws under ITA 2000.	CO2	8 Marks
	b)	Categorize the various cyber crimes under IPC.	CO2	6 Marks

UNIT-II

3.	a)	Explain Proxy Server and Anonymizers.	CO1	5 Marks
	b)	Demonstrate about the password cracking process. List the password attack methods.	CO3	9 Marks
		(OR)		
4.	a)	Illustrate various Keyloggers and Spywares attacks.	CO3	9 Marks
	b)	List and illustrate various DoS attacks.	CO1	5 Marks

UNIT-III

5.		Explain the impact of Digital Signatures in ITA 2000.	CO1	14 Marks
		(OR)		
6.	a)	Generalize the challenges to Indian law in cyber crime scenario.	CO1	8 Marks
	b)	Discuss your views on punishments for cybercriminals. Is it possible to punish them? If not, then what do you think are the deterring factors in India?	CO2	6 Marks

UNIT-IV

7.	a)	Can "cookies" impact data security and personal security? Explain how?	CO1	7 Marks
	b)	Describe any three of the "fair information practices" in the context of cookie usage in website design.	CO4	7 Marks
		(OR)		
8.	a)	Show the various web threats for organizations.	CO1	9 Marks
	b)	Explain the organizational guidelines for Internet usage.	CO6	5 Marks

UNIT-V

9.	a)	Describe in detail about Intellectual Property in the cyber space.	CO5	7 Marks
	b)	Classify and describe the bank and credit card related frauds.	CO2	7 Marks
		(OR)		
10.		Compare cyber crime illustration "Indian Banks lose Millions of Rupees" with "Nigerian 419 Scam".	CO2	14 Marks

CODE No.: 16BT61501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January - 2022

DATA WAREHOUSING AND DATA MINING
[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Draw and explain 3 tier Data Warehouse Architecture and its various components.	CO1	7 Marks
	b)	Describe in detail about Mapping the Data Warehouse to a multiprocessor architecture.	CO1	7 Marks

(OR)

2.	a)	Suppose that a data warehouse consists of four dimensions customer, product, salesperson and sales time, and the three measure sales Amt (in rupees), VAT (in rupees) and payment type (in rupees). Draw the different classes of schemas that are popularly used for modeling data warehouses and explain it.	CO4	7 Marks
	b)	How is data warehouse different from a database? How are they similar?	CO1	7 Marks

UNIT-II

3.	a)	How is Attribute-Oriented Induction implemented? Explain in detail.	CO1	7 Marks
	b)	Why do perform Data Transformation? Mention the ways by which data can be transformed.	CO5	7 Marks

(OR)

4.	a)	Why do we need to preprocess the data? What are the different forms of data preprocessing?	CO2	7 Marks
	b)	Describe in detail on the data mining functionalities and different kinds of patterns to be mined.	CO1	7 Marks

UNIT-III

5.	a)	Why naïve bayes classification is called naïve? Briefly outline the major steps involved in Bayes classification.	CO5	7 Marks
	b)	Write and explain the algorithm for mining frequent item sets without candidate generation.	CO1	7 Marks

(OR)

6.	a)	Consider the Data set D. Given the minimum support 2, apply apriori algorithm on this dataset.	CO4	7 Marks

Transaction ID	Items
100	A,C,D
200	B,C,E
300	A,B,C,E
400	B,E

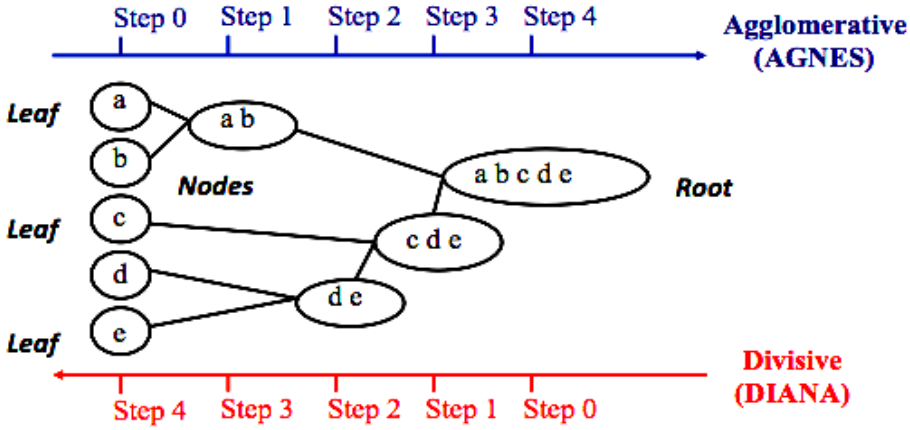
	b)	Develop an algorithm for classification using decision trees. Illustrate the algorithm with a relevant example.	CO6	7 Marks

UNIT-IV

7. a) Discuss the steps in K-means algorithm and evaluate the following table using K- means. CO4 7 Marks

Subject	A	B
1	1.0	1.0
2	1.5	2.0
3	3.0	4.0
4	5.0	7.0
5	3.5	5.0
6	4.5	5.0
7	3.5	4.5

b) Analyse the below diagram and draw the dendrogram using hierarchical clustering algorithm. CO3 7 Marks



(OR)

8. BIRCH and CLARANS are two interesting clustering algorithms that perform effective clustering in large data sets. Generalize the above statement in detail with examples. CO1 14 Marks

UNIT-V

9. Discuss in detail about web mining. Explain the algorithms used in mining structure and content of web with suitable examples. CO1 14 Marks

(OR)

10. Summarize the concepts and techniques in mining the text and spatial databases. CO1 14 Marks

CODE No.: 16BT71202 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations January - 2022

MOBILE APPLICATION DEVELOPMENT
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Analyze and explain the mobile user browsing behavior.	CO2	7 Marks
	b)	Discuss the key principles those are followed to design the user interfaces of mobile apps.	CO2	7 Marks
		(OR)		
2.		Explain the design patterns of Mobile apps.	CO1	14 Marks
		UNIT-II		
3.	a)	Explain the procedure to passing data between the activities using an Intent object.	CO1	7 Marks
	b)	Develop an android program to understand the activity behaviour when changes in mobile screen orientation.	CO3	7 Marks
		(OR)		
4.	a)	Develop an android program to display notifications on status bar.	CO3	7 Marks
	b)	List and discuss the common attributes of Views and View Groups.	CO1	7 Marks
		UNIT-III		
5.		List and discuss the Basic views in Android to design the user interface.	CO1	14 Marks
		(OR)		
6.		List and discuss the picker views in Android to design the user interface with an example program.	CO1	14 Marks
		UNIT-IV		
7.	a)	Create a Android program to access a web service and returns a string of random quotes.	CO4	7 Marks
	b)	Explain the methods to get the location detail that was touched on map by the user with a suitable program.	CO6	7 Marks
		(OR)		
8.		Discuss the accessing of web services using GET method with an example program.	CO4	14 Marks
		UNIT-V		
9.		Discuss the debugging methods of iOS applications with a neat sketch.	CO5	14 Marks
		(OR)		
10.		Illustrate the usage of the threads in an Android application with a suitable example.	CO3	14 Marks

CODE No.: 16BT71205 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, January 2022

CRYPTOGRAPHY AND NETWORK SECURITY

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	List the security services and describe the role of each service in network communication.	CO1	7 Marks
	b)	Generate the cipher text for the message "me" using hill cipher and with the key $\begin{pmatrix} 9 & 4 \\ 5 & 7 \end{pmatrix}$.	CO4	7 Marks
		(OR)		
2.	a)	Define security attack and describe different Security attacks.	CO1	7 Marks
	b)	Generate Cipher text for the plain text "Welcome to the Lab" using the Mono-alphabetic ciphering technique with key "craft".	CO4	7 Marks

UNIT-II

3.	a)	Compare the improvements of Oakley compared to Diffie–Hellman Algorithm	CO2	7 Marks
	b)	Differentiate Cipher block modes of operation.	CO2	7 Marks
		(OR)		
4.	a)	Illustrate how the diffie-hellman algorithm can be used for symmetric key distribution.	CO1	7 Marks
	b)	Explain the working of RSA algorithm with an example.	CO1	7 Marks

UNIT-III

5.	a)	Analyze the purpose of HMAC in network security and how it is generated? Explain with a neat sketch.	CO2	10 Marks
	b)	Define and explain the use of digital signature.	CO2	4 Marks
		(OR)		
6.	a)	Define Kerberos and Outline the procedure for authentication using Kerberos version4.	CO1	7 Marks
	b)	Write the role of digital signature in e-commerce?	CO3	7 Marks

UNIT-IV

7.	a)	IPSec provides Anti-Replay service. Justify	CO4	7 Marks
	b)	Apply Secure Electronic Transaction (SET) for online purchase.	CO3	7 Marks
		(OR)		
8.	a)	Differentiate between Transport and tunneling modes	CO2	7 Marks
	b)	Write the role of Security Association in IP Security and List the parameters used to identify the Security Association.	CO3	7 Marks

UNIT-V

9.	a)	Describe firewall configuration which can provide security at 3 levels to a private network.	CO5	7 Marks
	b)	Write about distributed denial of service attacks.	CO1	7 Marks
		(OR)		
10.	a)	Explain in detail the password selection strategies.	CO1	7 Marks
	b)	Explain the nature of viruses and the countermeasures to be taken to overcome them.	CO4	7 Marks

❀ ❀ ❀

CODE No.: 16BT3HS02 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations June - 2022

MANAGERIAL ECONOMICS AND PRINCIPLES OF ACCOUNTANCY
[Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. Define managerial economics. Explain the scope and importance of managerial economics. CO1 14 Marks

(OR)

2. Define Price elasticity. Explain the various factors determining the price elasticity of Demand. CO1, CO2 14 Marks

UNIT-II

3. What is production function? How the production functions are classified? Explain. CO2, CO3 14 Marks

(OR)

4. The following information was extracted from the books of Swadesh Ltd. CO2 14 Marks

Particulars	Rs.
Sales	3,00,000
Variable Costs	2,10,000
Fixed costs	70,000

Calculate the following
i) P/V Ratio.
ii) Break Even Point
iii) Margin of Safety.
iv) Sales require to earn a profit of Rs. 35,000.

UNIT-III

5. What is monopolistic competition? Explain the important features of monopolistic competition. CO1, CO2 14 Marks

(OR)

6. Why is price so significant in the context of business? Explain any four methods of pricing based on strategy. CO1, CO3 14 Marks

UNIT-IV

7. What is Trail balance? State the main objectives of preparing the trail balance. CO1, CO4 14 Marks

(OR)

8. From the following transactions write Journal entries into the books of Govardhan. CO3 14 Marks

2018	Particulars	Rs.
May 5	Goods sold for Cash	2,50,000
May 7	Goods Purchased for cash	1,20,000
May 9	Purchase of Goods on credit from Vishnu	80,000
May 11	Sale of Goods to Mahesh on credit	60,000
May 14	Cash received from Mahesh	55,000
May 16	Cash paid to Vishnu	80,000
May 25	Furniture purchased for cash	30,000

UNIT-V

9. What is Tally? Explain the advantages of using Tally for computerizing the accounts of an organisation. CO1, CO2 — 14 Marks

(OR)

10. From the following Trail Balance of Manoj prepare Trading and Profit and Loss Account for the year ended 31st December, 2017 and Balance Sheet as on that date. CO4, CO5 — 14 Marks

Particulars	Debit Balances	Credit Balances
Capital		13,000
Wages	6,500	
Carriage inwards	275	
Administrative expenses	105	
Purchases and Sales	21,750	35,000
Commission	425	
Salaries	2,000	
Trade expenses	600	
Interest	250	
Travelling expenses	400	
Building	5,000	
Furniture	200	
Sundry Debtors	4,250	
Cash in hand	7,045	
Sundry Creditors		2,100
Discount allowed	1,300	
Suspense Account		
TOTAL	**50,100**	**50,100**

Additional information:

i) Stock on December 31st , 2017 was Rs 6,000
ii) Depreciation on Buildings by 5% and
iii) Interest on Capital at 10%.

CODE No.: 16BT5HS01 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations June - 2022

MANAGEMENT SCIENCE

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Describe the nature and importance of Management.	CO1	7 Marks
	b)	Explain about the merits and demerits of line and staff organization.	CO3	7 Marks
		(OR)		
2.	a)	Explain Henry Fayol's principles of management.	CO1	7 Marks
	b)	Illustrate the Matrix and Functional organizational in detail.	CO1	7 Marks

UNIT-II

3.	a)	What are the various types of plant layouts? Explain with suitable examples and diagrams.	CO3	7 Marks
	b)	Define EOQ. What are the factors that determine EOQ?	CO2	7 Marks
		(OR)		
4.	a)	Define the term "Work Study" and state its objectives.	CO2	7 Marks
	b)	What are the objectives of Inventory Control?	CO2	7 Marks

UNIT-III

5.	a)	Explain about the role of HR manager in an organization with suitable examples.	CO4	7 Marks
	b)	Explain about Mc Gregor's Theory X and theory Y.	CO3	7 Marks
		(OR)		
6.	a)	Define HRM. Explain the Nature and scope of HRM.	CO2	7 Marks
	b)	Elaborate the Maslow's Hierachey human needs with examples.	CO3	7 Marks

UNIT-IV

7.	a)	Compare and contrast between CPM and PERT, in the context of project management.	CO4	7 Marks
	b)	Describe the role of entrepreneurship in Economic development.	CO4	7 Marks
		(OR)		
8.		The essentials of cost and duration are provided.	CO5	14 Marks

	Normal Cost		*Crash Cost*	
Activity	Days	Cost (Rs.)	Days	Cost (Rs.)
1-2	3	500	2	1,000
1-3	2	1,000	1	2,000
2-4	6	1,400	3	2,500
4-5	4	1,000	2	2,500

Draw the network diagram and calculate cost slopes.

UNIT-V

9.	a)	Explain about the role of supply chain management in modern era.	CO5	7 Marks
	b)	Write short notes on Balanced Score Card.	CO3	7 Marks
		(OR)		
10.		Explain the concept of JIT. How does it help the manufacturing system to improve productivity?	CO5	14 Marks

CODE No.: 16BT40502 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations June - 2022

DATABASE MANAGEMENT SYSTEMS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	List and explain the advantages of DBMS.	CO2	7 Marks
	b)	A company database needs to store information about employees (identified by ssn, with salary and phone as attributes), departments (identified by dno, with dname and budget as attributes), and children of employees (with name and age as attributes). Employees work in departments; each department is managed by an employee; a child must be identified uniquely by name when the parent (who is an employee; assume that only one parent works for the company) is known. We are not interested in information about a child once the parent leaves the company. Draw an ER diagram that captures this information.	CO1	7 Marks

(OR)

2.	a)	What is data abstraction? Classify the levels of abstraction in a DBMS.	CO2	7 Marks
	b)	Define the following with examples: i) Key Constraints. ii) Aggregation. iii) Weak Entities. iv) Strong Entities.	CO1	7 Marks

UNIT-II

3.	a)	Consider the following relational schema : Sailors(sid: integer, sname: string, rating: integer, age: real) Boats(bid: integer, bname: string, color: string) Reserves(sid: integer, bid: integer, day: date) Write the Relational Algebraic expressions for the following. i) Find the names of sailors who have reserved boat number 103. ii) Find the names of sailors who have reserved at least one boat. iii) Find the names of sailors who have reserved both a red and a green boat . iv) Find the names of sailors who have reserved all boats.	CO3	7 Marks
	b)	Mention the differences between Relational Algebra and Relational Calculus with suitable examples.	CO3	7 Marks

(OR)

4.	a)	What is view? Discuss in detail about altering tables and views with examples.	CO3	7 Marks
	b)	Consider the following schema: Suppliers(sid: integer, sname: string, address: string) Parts(pid: integer, pname: string, color: string) Catalog(sid: integer, pid: integer, cost: real) The key fields are underlined, and the domain of each field is listed after the field name. Therefore sid is the key for Suppliers, pid is the key for Parts, and sid and pid together form the key for Catalog. The Catalog relation lists the prices charged for parts by Suppliers. Write the following queries in tuple relational calculus, and domain relational calculus: i) Find the names of suppliers who supply some red part. ii) Find the sids of suppliers who supply some red or green part.	CO4	7 Marks

UNIT-III

5.	a)	The employee information in a company is stored in the relation Employee (name, sex, salary, deptName). Write an SQL query to return the names of the department in which the average salary of male employees is more than the average salary in the company.	CO3	7 Marks
	b)	Demonstrate correlated nested queries with examples.	CO3	7 Marks

(OR)

6.	a)	Define Trigger? Identify different types joins in SQL with examples.	CO3	7 Marks
	b)	Consider the following relation for published books: BOOK (Book_title, Authorname, Book_type, Listprice, Author_affil, Publisher) Author_affil referes to the affiliation of the author. Suppose the following dependencies exist: Book_title → Publisher, Book_type Book_type → Listprice Author_name → Author-affil i) What normal form is the relation in? Explain your answer. ii) Apply normalization until you cannot decompose the relations further. State the reasons behind each decomposition.	CO2	7 Marks

UNIT-IV

7.	a)	Enumerate validation based locking protocol with example.	CO4	7 Marks
	b)	What is the two-phase locking protocol? How does it guarantee serializability?	CO4	7 Marks

(OR)

8.	a)	Identify the way to implement Atomicity and Durability.	CO2	7 Marks
	b)	Discuss Multiple Granularity and Deadlock handling in concurrency control.	CO4	7 Marks

UNIT-V

9.	a)	Explain how hashing is used for file organization. Discuss about static hashing and dynamic hashing.	CO5	7 Marks
	b)	Outline an algorithm for deletion from a B+ Tree.	CO3	7 Marks

(OR)

10.	a)	Explain the difference between Hash indexes and B+ Tree indexes.	CO5	7 Marks
	b)	Apply the concept of B+ tree to implement multilevel indexing.	CO6	7 Marks

CODE No.: 16BT60101 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations June - 2022

FOUNDATION ENGINEERING
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What kind of care is to be exercised for preservation, labeling and shipment of the samples?	CO6	7 Marks
	b)	What do you understand about disturbed and undisturbed samples? How would you obtain undisturbed samples?	CO1	7 Marks
		(OR)		
2.	a)	Describe the various methods of drilling techniques for sub surface investigations.	CO1	5 Marks
	b)	Discuss standard penetration test. What are the various corrections? What is the importance of the test in geotechnical engineering?	CO2	9 Marks

UNIT-II

3.	a)	Define lateral earth pressure, explain culmann's graphical construction for active pressure and write the steps involved in construction of culmann's graphical method.	CO4	7 Marks
	b)	A 6m high retaining wall is to support a soil of unit weight Υ=17.4kN/m^3. Soil friction angle Φ' = 26^0 and cohesion C'= 14.36kN/m^2. Determine the Rankine active force per unit length of the wall both before and after the tensile crack occurs and determine the line of action of the resultant in both cases	CO6	7 Marks
		(OR)		
4.	a)	Explain briefly the design considerations for retaining walls.	CO4	6 Marks
	b)	A retaining wall of 8 m high with a smooth vertical back retains a clay backfill with c' = 18 kN/m^2, ϕ' = 15° and y = 17 kN/m^3. Estimate the total active thrust on the wail assuming that tension cracks may develop to the full theoretical depth.	CO2	8 Marks

UNIT-III

5.	a)	Explain the conditions of failure for cohesionless soils and cohesive soils in stability analysis of infinite slopes.	CO2	6 Marks
	b)	Determine the factor of safety with respect to cohesion only for a submersed embankment 25m high whose upstream face has an inclination of 45^0. The soil has the following properties, c=40 kN/m^2, ϕ=10^o, γ_{sat}=18 kN/m^3. The relevant stability number is equal to 0.108.	CO2	8 Marks
		(OR)		
6.	a)	Discuss different types of failure surfaces that can be considered in slope stability analyses.	CO1	6 Marks
	b)	Derive the equation for FS of infinite slope in a dry cohesionless soil.	CO2	8 Marks

UNIT-IV

7.	a)	Explain the Terzaghi's bearing capacity theory with assumptions	CO2	6 Marks
	b)	A 3m x 4m rectangular footing is eccentrically loaded. The resultant is 0.2m outside of centroid widthwise, and 0.3m outside of centroid lengthwise. If c = 10 kPa, ø= 25º, γ=16kN/m³, find the safe load carried by footing. What would have been the increase in load carried, if the load was concentric? Take N**c**=25.1, N**q** =12.7, N**γ** = 9.7.	CO3	8 Marks

(OR)

8.	a)	A column carrying a load of 750 kN, has to be supported by a square footing with its base at 1.5m depth. What is the required size of the foundation which will provide a factor of safety of 3 against shear failure? Assume c′ = 10kN/m² and Φ′ = 30⁰, γt = 18kN/m³, γ′ = 10kN/m³. Water table is at 1.5m depth. Use Terzaghi's equation. Take N**c**=37.2, N**q**=22.5, N**γ**=19.7	CO2	6 Marks
	b)	Calculate the ultimate bearing capacity of 2m wide square footing resting on the ground surface of sand deposit with the following properties; Unit weight 18.6 kN/m³, angle of internal friction 35º, Nq = 41.4, Nγ = 42.2. Also calculate ultimate bearing capacity, if same footing is placed at a depth of 1 m below ground surface.	CO2	8 Marks

UNIT-V

9.	a)	Explain open caisson, Box caisson and Pneumatic caisson.	CO1	4 Marks
	b)	A 30 cm diameter concrete pile is driven in a normally consolidated clay deposit 15m thick. Estimate the safe load. Take Cu = 70 kN/m², α = 0.9 and F.S = 2.5.	CO2	5 Marks
	c)	Compute the immediate settlement beneath the center of 2.0m x 3.0m flexible footing resting at 0.6m below the ground surface and carrying 800 kN load. The supporting soil deposit is uniform unsaturated clay with an average undrained strength of 120 kN/m².	CO2	5 Marks

(OR)

10.	a)	With a neat sketch, explain the components of well foundations.	CO2	4 Marks
	b)	How can you estimate the settlement of foundation cohesion less soils?	CO1	3 Marks
	c)	A group of 16 piles of 50 cm diameter is arranged with a centre to centre spacing of 1.0m. The piles are 9m long and are embedded in soft clay with cohesion 30 kN/m². Bearing resistance may be neglected for the piles. Adhesion factor is 0.6. Determine the ultimate load capacity of the pile group.	CO2	7 Marks

CODE No.: 16BT60110 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations June - 2022

SOLID WASTE MANAGEMENT
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Explain the sources and types of solid wastes.	CO1	7 Marks
	b)	Explain the effects of improper disposal of solid wastes.	CO6	7 Marks
		(OR)		
2.	a)	What are the characteristics of municipal solid waste?	CO1	7 Marks
	b)	Explain the role of NGOs in effective solid waste management.	CO4	7 Marks
		UNIT-II		
3.	a)	What are the principles of solid waste management?	CO4	7 Marks
	b)	Explain about on site segregation and storage methods of municipal solid waste.	CO1	7 Marks
		(OR)		
4.	a)	Describe the types of materials used for the storage containers.	CO9	7 Marks
	b)	Describe the public health and economical aspects of storage of municipal solid waste.	CO6	7 Marks
		UNIT-III		
5.	a)	Briefly explain the status of collection and transportation of municipal solid waste in India.	CO1	7 Marks
	b)	Discuss briefly about layout of collection routes.	CO1	7 Marks
		(OR)		
6.	a)	Explain about the operation and maintenance of vehicles used for collection and transportation of municipal solid waste.	CO9	7 Marks
	b)	Enumerate the various methods which can be used for collection of solid waste, and explain methods.	CO1	7 Marks
		UNIT-IV		
7.		Describe the various processing techniques and equipment of solid waste.	CO5	14 Marks
		(OR)		
8.	a)	What is the importance of C-N ratio and moisture content of compost heap mass of the organic solid waste to be used for anaerobic composting process?	CO4	7 Marks
	b)	Explain off-site processing of solid waste by incineration and pyrolysis.	CO1	7 Marks
		UNIT-V		
9.	a)	What are the environmental effects due to leaching and also explain the leachate collection systems?	CO5	7 Marks
	b)	Discuss the design and operation process of sanitary landfill.	CO3	7 Marks
		(OR)		
10.	a)	Enumerate the various methods which can be used n for disposal of solid waste, and explain any two adopted methods in India.	CO1	7 Marks
	b)	Describe the biomedical waste management.	CO1	7 Marks

CODE No.: 16BT60202 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, June - 2022

POWER SYSTEM ANALYSIS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) What are sequence components? Prove that the generator will produce positive sequence voltages only. CO2 4 Marks

   b) A 100 MVA, 13.2 kV generator (G) having a synchronous reactance of 10% is connected to a star-star transformer T_1 which feeds a 132 kV line having an impedance per phase of 20+j50Ω. At the receiving end of the line there is a star-star step down transformer T_2. A load drawing 60 MVA at 0.9 power factor lagging is connected to the secondary of transformer T_2. The transformer ratings are as follows: CO4 10 Marks
   Transformer T_1: 120MVA, 13.2/132kV, XT1=12%.
   Transformer T_2: 100MVA, 138/33kV, XT2=15%.
   Using a base of 100 MVA and a voltage base of 33 kV in the load side of the circuit, draw a one line impedance diagram for the above power system showing all the equipment parameters and the voltage base in different sections of the system.

(OR)

2. a) Show that the symmetrical component transformation is power invariant. CO2 7 Marks

   b) The line currents in a 3-phase supply to an unbalanced load are I_a = - 10+ j 20 , I_b = 12 - j10 and I_c = - 3 - j5 amperes respectively**.** The phase sequence is *abc*. Determine the sequence components of currents. CO3 7 Marks

UNIT-II

3. a) Prove that when there is no mutual coupling between the elements of a network, the diagonal and off-diagonal elements of the bus admittance matrix can be computed as $Y_{ij} = \sum_{i=j} y_{ij}$ and $Y_{ij} = Y_{ji}$. CO3 7 Marks

   b) Using the method of direct inspection, find the bus admittance matrix for the network connection given: CO3 7 Marks

Element	Bus code (From-To)	Impedance
1	1- 2	0.2j
2	2-3	0.5j
3	2-1	0.15j
4	3-1	0.3j

(OR)

4. a) Develop step-by-step algorithm to form Z_{bus}, for the addition of element from a new bus to reference without mutual coupling. CO2 7 Marks

   b) Form Z_{bus} by algorithm for the power system network, data for the network is given in the table below. CO3 7 Marks

Element	Bus Code	Impedance (p.u)
1	1-2	0.15
2	2-3	0.65
3	3-1	0.35

UNIT-III

5. a) Write down the assumptions made in reducing decoupled method to fast decoupled method of power flow solution. CO1 6 Marks

   b) Carry out one iteration of power flow analysis for the power system with the following data and given the voltages in polar form at the end of first iteration by NR method. CO4 8 Marks

Bus No.	Bus type	V (pu)	Generation		Load		Line data	
			P	Q	P	Q	Bus code	Impedance
1	Slack	1.01	---	---	---	---	1-2	0.15j
2	PV	1.0	0.7	---	---	---	2-3	0.15j
3	PQ	---	---	---	1.0	0.4	3-1	0.15j

(OR)

6. a) Compare GS-method, NR, decoupled and FDLF methods with respect to: Number of iterations, convergence characteristic and memory requirements. CO2 4 Marks

   b) In a 2-Bus power system with Bus-1 as slack bus, $V_1 = 1.0\angle 0°$ p.u., $P_2=1$ and $Q_2 = 0.5$ p.u. with $Z_{12} = 0.012+j0.16$ p.u. Using GS-method, determine V_2 after first iteration. Also find the line flows and line losses. CO3 10 Marks

UNIT-IV

7. a) Derive an expression for the fault current for a single line-to-ground fault with fault impedance on an unloaded generator. CO2 7 Marks

   b) A three phase fault with a fault impedance of 0.16 p.u. occurs at bus 3 , for which Z_{BUS} is given by : CO3 7 Marks

$$Zbus = \begin{bmatrix} 0.016j & 0.08j & 0.12j \\ 0.08j & 0.24j & 0.16j \\ 0.12j & 0.16j & 0.34j \end{bmatrix}$$

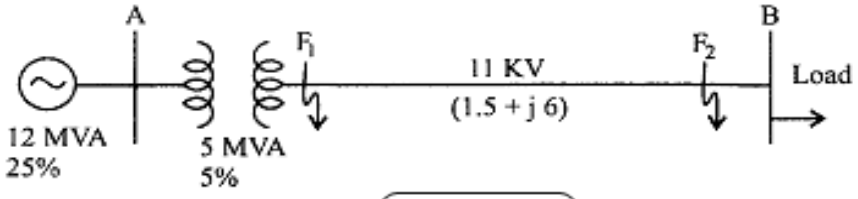
Compute the fault current, the bus voltages and the line currents during the fault. Assume pre-fault bus voltages 1.0 per unit.

(OR)

8. a) List the various types of shunt and series faults and enumerate their attributes. CO1 4 Marks

   b) A 3-phase line shown in figure, operating at 11 kV and having a resistance of 1.5 Ohms and reactance of 6 Ohms is connected to a generating station bus bars through a 5 MVA step-up transformer having reactance of 5%. The bus bars are supplied by a 12 MVA generator having 25% reactance. Calculate the short circuit kVA fed into a symmetric fault: CO5 10 Marks

   i) at the load end of the transformer and
   ii) at the h.v. terminals of the transformer.



UNIT-V

9. a) Deduce the equation to find synchronizing power coefficient. CO2 7 Marks

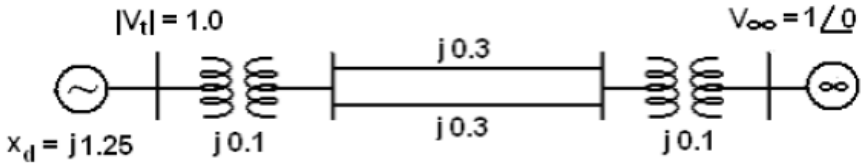
   b) A 275 kV transmission line has following line constants. $A = 0.85\angle 50^0$, $B=200\angle 75^0$. The line delivers 150 MW with $|V_S| = |V_R| = 275$ kV. Determine synchronizing power coefficient. CO3 7 Marks

(OR)

10. a) Differentiate between steady state stability and transient stability of a CO2 6 Marks

power system. Discuss the factors that affect steady state stability and transient state stability.

b) A generator supplies 1.0 p.u. power to an infinite bus as shown in figure. The terminal voltage and infinite bus voltage are 1.0 p.u. All the reactances are on a common base. CO5 8 Marks



Determine steady state stability limit when both lines are in and when one line is switched off.

❁ ❁ ❁

CODE No.: 16BT60203 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations June - 2022

DESIGN AND ESTIMATION OF ELECTRICAL SYSTEMS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Describe the different systems of wiring used for domestic installations.	CO1	7 Marks
	b)	Explain the tests to be performed under the Indian electricity rules before energising a domestic installation.	CO7	7 Marks
		(OR)		
2.	a)	Describe the procedure for determination of conductor size in domestic installation.	CO1	7 Marks
	b)	Describe the methods of draining cables through a conduit. Explain why a conduit is earthed.	CO3	7 Marks

UNIT-II

3.	a)	Explain the procedure for the estimation of H.T. lines for the distribution line.	CO2	7 Marks
	b)	Estimate the quantity of material required for an 11 kV, 3-phase overhead line with 7/2.59 mm ACSR conductors for 1 km long on 8 m PSCC poles. The span between two poles is 75 m.	CO2	7 Marks
		(OR)		
4.	a)	Explain the testing and commissioning of overhead distribution lines.	CO1	6 Marks
	b)	An overhead 3-phase, 415 V distributor is to be laid along a straight route 300m long. The end supports are terminal poles with 50m span in between. Prepare list of material for lying distributor. The following data may used: Conductor: ACSR $\frac{6}{1} \times 2.11$ mm for phase, neutral and street light. Earth wire: GI wire, 8 SWG, 1 kg/10m weight. L.T. cable: 4-core, 60 mm², 1100 V grade. Distance of first terminal pole from the substation is 12 m.	CO2	8 Marks

UNIT-III

5.	a)	Explain the purpose of providing the substation earthing systems.	CO2	6 Marks
	b)	Estimate the quantity of material required for the augmentation of 33 kV grid substation of 500 KVA to 1000 KVA, 33/11 KV grid substation.	CO2	8 Marks
		(OR)		
6.	a)	Explain the classification of substations.	CO1	6 Marks
	b)	Draw and estimate the material required for 66/11 KV substation, with following details: i) Input lines – 2, having 66 KV. ii) Output lines – 2, 66 KV. iii) Output line – 0, 6 numbers, 11 KV.	CO2	8 Marks

UNIT-IV

7.	a)	Explain how the polar curves can be applied to light sources.	CO1	6 Marks
	b)	Two similar lamps having uniform intensity of 500 CP in all directions below the horizontal are mounted at a height of 4 m. What must be the maximum spacing between the lamps so that the illumination on the ground midway between the lamps shall be at least one-half the illuminations directly under the lamps?	CO3	8 Marks

(OR)

8.	a)	State the laws of illumination. Explain the laws with the help of diagrams and derive an equation of the same.	CO5	7 Marks
	b)	A room with an area of 6 x 9m is illuminated by ten 80 W lamps. The luminous efficiency of the lamp is 80 lumens/W and the coefficient of utilization is 0.65. Find the average illumination.	CO3	7 Marks

UNIT-V

9.	a)	Describe the methods of direct and indirect resistance heating. Explain their applications.	CO6	7 Marks
	b)	A 4.5 kW, 200 V and single phase resistance oven is to have nichrome wire heating elements. If the wire temperature is to be 1000^0C and that of the charge 500^0C. Estimate the diameter and length of the wire. The resistivity of the nichrome alloy is 42.5μΩ-m. Assume the reading efficiency and the emissivity of the element as 1.0 and 0.9 respectively.	CO5	7 Marks

(OR)

10.	a)	Explain the difference between carbon and metallic arc welding. Give their relative merits and demerits.	CO5	6 Marks
	b)	Describe the various methods of current flow control in welding transformers.	CO5	8 Marks

CODE No.: 16BT60205 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations June – 2022

ELECTRICAL MACHINE DESIGN
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss the basic design principles for an Electrical Machine.	CO1	7 Marks
	b)	Discuss different insulating materials used in modern electrical machines.	CO1	7 Marks
		(OR)		
2.	a)	Derive the equation for mean temperature rise of an electrical machine during its intermittent heating.	CO2	7 Marks
	b)	The temperature rise of a transformer is 25^{o}C after one hour and 37.5^{o}C after 2 hours of starting from cold conditions. Calculate its final steady temperature rise and the heating time constant, If its temperature falls from the final steady value to 40^{o}C in 1.5 hours when disconnected, calculate its cooling time constant. The ambient temperature is 30^{o}C.	CO4	7 Marks

UNIT-II

3.	a)	Discuss the factors to be considered while selecting the specific electric and magnetic loading for DC Machine.	CO3	7 Marks
	b)	A 4 pole, 25 HP, 500 V, 600 r.p.m series motor has an efficiency of 82%. The pole faces are square and the ratio of pole arc to pole pitch is 0.67. Take Bav = 0.58 Wb/m^2 and ac = 17000 amp.cond/m. Obtain the main dimensions of the core.	CO4	7 Marks
		(OR)		
4.	a)	Derive the relation between real and apparent flux densities in DC Machines.	CO2	7 Marks
	b)	Design a suitable commutator for a 350kw, 600 r.p.m, 440V, 6 poles DC generator having an armature diameter of 0.75m. The number of slots is 288. Assume suitable values where it's necessary.	CO4	7 Marks

UNIT-III

5.	a)	Derive the output equation of a Three phase Transformer	CO2	5 Marks
	b)	Determine the main dimensions of the core for a 250 kva, 6600/415v, 50Hz, 3-Φ transformer with star connection windings. Assume the following data. Volt per turn = 9v, Maximum flux density = 1.25 wb/m^2, A_i = 0.62d^2, window space factor = 0.27. Height of window / width of window = 2, current density = 2.50A/sq mm.	CO4	9 Marks
		(OR)		
6.	a)	List the factors affecting the choice of flux density of core in transformer.	CO3	5 Marks
	b)	A single phase 400V, 50HZ transformer is built from stampings having a relative permeability of 1000. The length of the flux path is 2.5 x 10^{-3}m^2 and the primary winding has 800 turns. Estimate the maximum flux and no load current of the transformer. The iron loss at the working flux density is 2.6W/Kg. Iron weighs 7.8 x 1000 Kg/m^3. Stacking factor is 0.9.	CO4	9 Marks

UNIT-IV

7.	a)	Derive the output equation of a 3-phase induction motor.	CO2	5 Marks
	b)	Determine the main dimensions for a 400V, 3-phase, 50hz, 1410 r.p.m, 250HP, delta connected IM has specific loading of 0.5wb/m² and 30000 ampere conductors per meter, efficiency =0.9, p.f = 0.9, K_w = 0.955.	CO4	9 Marks

(OR)

8.	a)	Discuss the various points to be considered for selecting the rotor slots of a 3-phase Squirrel cage Induction motor.	CO5	5 Marks
	b)	Calculate the magnetizing current of a 450V, 4 pole, 3-phase, 50HZ, induction motor having the following data. No. of slots = 36, No. of stator conductor/slot =30, stator core diameter = 13cm, axial length of stator = 13cm, effective air gap length = 0.1cm, winding is full pitched, phase spread angle is 60^o, gap contraction factor = 1, assume that the iron loss has infinite permeability.	CO4	9 Marks

UNIT-V

9.	a)	List the important consideration for the choice of no of slots on the armature of Synchronous machine.	CO5	7 Marks
	b)	Find the main dimensions of a 2550 KVA, 187.5 r.p.m, 50 c/s, 3-ϕ 3.3 KV salient pole generator. Assume Bav = 0.61 wb/m², ac = 34500 A/m. use circular poles. L/τ = -.66, KW=0.955, η=90%.	CO4	7 Marks

(OR)

10.	a)	Discuss the design of a field coil for an alternator.	CO3	7 Marks
	b)	A 3-phase alternator has D=1.7m, L=0.35m, Bav= 0.55 wb/m², star connected. Find suitable number of slots and conductors/slot, for terminal voltage of 6.6KW, 50c/s at 375 r.p.m.	CO4	7 Marks

CODE No.: 16BT60206 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations June – 2022

HVDC TRANSMISSION
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Illustrate the various types of dc link available with neat sketches. Also list any four of HVDC lines existing in India with technical specifications.	CO6	7 Marks
	b)	Explain the Modern trends in HVDC transmission.	CO1	7 Marks
		(OR)		
2.	a)	For a fixed power of transmission explain how the economic choice of voltage levels is selected in DC transmission system.	CO6	8 Marks
	b)	Explain the technical development in control and protection for better performance and reliability of DC transmission system.	CO1	6 Marks

UNIT-II

3.	a)	Draw the schematic circuit diagram of a 6 pulse gratez's circuit and explain its principle of operation.	CO2	8 Marks
	b)	If a 6-pulse bridge rectifier is operating from 220 kV voltage supply through the transformer. Find the output voltage of rectifier when the firing (delay) angle is (i) 0^0 (ii)15^0 and (iii) 90^0. Assume there is no source reactance.	CO4	6 Marks
		(OR)		
4.	a)	Develop the equivalent circuit of a converter working as rectifier with an overlap angle μ and delay angle α. Show that the equivalent resistance of the converter is $3\omega Ls/\pi$.	CO2	7 Marks
	b)	Show that the expression for the power factor of an HVDC converter is $1/2(\cos \alpha+\cos(\alpha+ \mu))$.	CO2	7 Marks

UNIT-III

5.	a)	Explain the necessity of compounding both rectifier and inverter station with constant current control.	CO2	6 Marks
	b)	Explain constant Extinction angle and constant ignition angle to control the HVDC system.	CO2	8 Marks
		(OR)		
6.	a)	State the different firing control schemes adopted for HVDC systems with neat sketches. Explain the difference in operation of each method.	CO5	8 Marks
	b)	Explain start and stop process of DC link.	CO6	6 Marks

UNIT-IV

7.	a)	Define characteristic and non characteristics harmonics. Derive the expression for characteristic harmonics on AC network side with 6 pulse converter operation.	CO1	8 Marks
	b)	Explain the design procedure for passive AC filters for mitigating AC side harmonics in HVDC Link.	CO3	6 Marks
		(OR)		

8.	a)	With the aid of an equivalent circuit, outline the design procedure of a single tuned filter used in the AC side of a HVDC link.	CO3	7 Marks
	b)	Illustrate the main objectives in designing the size and branches o f AC harmonic filters and DC harmonic filters in a HVDC substation.	CO3	7 Marks

UNIT-V

9.	a)	Explain briefly the faults on the AC side of HVDC systems.	CO1	7 Marks
	b)	Explain the occurrence of commutation failure in inverters. Discuss its effects with voltage and current waveforms.	CO1	7 Marks

(OR)

10.	a)	Explain the principle of current interruption in DC circuit breakers.	CO5	7 Marks
	b)	Explain the protection schemes against over voltage and over current in converter station.	CO2	7 Marks

CODE No.: 16BT60207 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations June - 2022

ADVANCED CONTROL SYSTEMS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. What is Lag Compensator? Explain the procedure for cascade lag compensation using root locus technique. CO1 14 Marks

(OR)

2. A Unity feedback system has an open loop transfer function $(s) = \frac{K}{s(s+2)}$. The system is to be compensated to meet the following specifications. CO3 14 Marks

Damping ratio $\varsigma = 0.707$
Settling time $t_s \leq 5$ sec
Velocity error constant $K_v \geq 4$

UNIT-II

3. Determine the state controllability, output controllability and observability of the system represented by CO4 14 Marks

$$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \\ \dot{x}_3 \end{bmatrix} = \begin{bmatrix} 0 & 2 & 0 \\ 1 & 2 & 0 \\ -1 & 0 & 1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix} u$$

$$y = \begin{bmatrix} 1 & 0 & 1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}$$

(OR)

4. The state model for a system is given by CO1 14 Marks

$$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \\ \dot{x}_3 \end{bmatrix} = \begin{bmatrix} 0 & 0 & 1 \\ -2 & -3 & 0 \\ 0 & 2 & -3 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} + \begin{bmatrix} 0 \\ 2 \\ 0 \end{bmatrix} u$$

$$y = \begin{bmatrix} 1 & 0 & 0 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}$$

Determine the controllability and observability of the system using Jordan canonical form.

UNIT-III

5. a) Derive the describing function for dead zone nonlinearity. CO2 7 Marks
   b) Explain about some common physical nonlinearities. CO2 7 Marks

(OR)

6.		Construct phase trajectory for the system described by the equation $\frac{dx_2}{dx_1} = \frac{4x_1 + 3x_2}{x_1 + x_2}$ Comment on the stability of the system.	CO2	14 Marks

UNIT-IV

7.	a)	Explain the Direct method of Lyapunov for LTI autonomous systems.	CO2	7 Marks
	b)	Determine the stability of the system $\dot{x} = AX$ where $A = \begin{bmatrix} -1 & -2 \\ 1 & -4 \end{bmatrix}$ and obtain suitable Lyapunov function.	CO5	7 Marks

(OR)

8.	a)	State Explain variable gradient method for constructing Lyapunov function theorem.	CO4	7 Marks
	b)	Consider the nonlinear system $\dot{x}_1 = -x_1$ $\dot{x}_2 = x_1 - x_2 - 2x_2^3$ Determine the stability using Krasovskii's method.	CO4	7 Marks

UNIT-V

9.		A regulator system has a plant $\frac{Y(s)}{U(s)} = \frac{5}{(s+4)(s+5)(s+6)}$ Define state variables as $x_1 = y$ $x_2 = \dot{x}_1$ $x_3 = \dot{x}_2$ Design the necessary state feedback gain matrix K to place the closed-loop poles at $s = -4 \pm j2\sqrt{3}, s = -20$.	CO3	14 Marks

(OR)

10.		With the help of neat block diagram, design a full order observer and compare it with minimum order observer.	CO3	14 Marks

CODE No.: 16BT60210 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations June - 2022

SPECIAL ELECTRICAL MACHINES
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss in detail, about the construction and working principle of Variable Stepper Motor.	CO1	7 Marks
	b)	A single stack, 3-phase variable Reluctance Motor has a step angle of 15 degrees. Find the number of stator and rotor poles.	CO4	7 Marks

(OR)

2.	a)	Explain the mechanism of static torque production in a variable reluctance Stepping Motor.	CO1	7 Marks
	b)	Describe the dynamic characteristics of a variable reluctance Stepper Motor.	CO1	7 Marks

UNIT-II

3.	a)	Draw the cross sectional view of Switched Reluctance Motor and explain the principle of operation.	CO1	9 Marks
	b)	Discuss how SRM different from other motors and state the advantages of switched reluctance motor.	CO2	5 Marks

(OR)

4.	a)	Why do we need rotor position sensing? Discuss the various methods of rotor position sensing in SRMs	CO5	7 Marks
	b)	Explain the closed loop control operation of SRM and its performance characteristics in detail.	CO1	7 Marks

UNIT-III

5.		Explain the construction and operation of Axial and Radial flux motors with neat diagrams.	CO1	14 Marks

(OR)

6.	a)	Discuss the various stator current modes in a Synchronous Reluctance Motor in detail.	CO1	7 Marks
	b)	A 3-Phase, 4 pole, 50hz, 390 Volts star connected Synchronous Reluctance Motor has direct axis and quadrature axis synchronous reactances of 8 ohms and 2 ohms respectively. For a load torque of 82 N-M, find load angle, line current and power factor, Neglect armature resistance and mechanical losses.	CO4	7 Marks

UNIT-IV

7.		Discuss the sensing and switching logic Schemes of BLDC motor with neat diagrams.	CO1	14 Marks

(OR)

8.		Why do we need sensors? Discuss the sensing and sensor less based control of BLDC Motor with neat diagrams	CO5	14 Marks

UNIT-V

9.		Discuss Construction and principle of operation of LIM with neat diagrams.	CO1	14 Marks

(OR)

10.	a)	Develop the equivalent circuit of a linear Induction Motor at standstill and running conditions.	CO3	7 Marks
	b)	Discuss the principle of operation of LSM.	CO1	7 Marks

CODE No.: 16BT60301 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations June - 2022

CAD / CAM
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Explain the computer aided design process. In what way it is different from conventional design process.	CO1	14 Marks
		(OR)		
2.	a)	Summarize a short note on CAD database and structure.	CO1	7 Marks
	b)	With the help of block diagram, explain the hard ware configuration of a typical standalone CAD system.	CO1	7 Marks

UNIT-II

3.	a)	Apply a 45º rotation of a triangle, $A(0,0)$, $B(1,1)$, $C(5,2)$ about the point P(-1, -2).	CO1	7 Marks
	b)	Interpret on: i) Composite transformation. ii) Reflection transformation.	CO1	7 Marks
		(OR)		
4.	a)	Give a brief account on Solid representation and Sweep representation.	CO3	6 Marks
	b)	Explain CSG scheme for complex solid modeling objects representations. Also give its disadvantages.	CO3	8 Marks

UNIT-III

5.	a)	What is dwell? Explain its function and how it is specified in part program.	CO4	6 Marks
	b)	What is computer aided part programming? Discuss its need.	CO1	8 Marks
		(OR)		
6.	a)	Explain manual part programming procedure through a flow chart.	CO4	6 Marks
	b)	How is the tool length compensation specified in a machining center?	CO4	4 Marks
	c)	List out the advantages derived from the use of CNC as compared to NC.	CO1	4 Marks

UNIT-IV

7.		What are the differences between retrieval and generative type of computer aided process planning? Which is better? Explain your choice.	CO1	14 Marks
		(OR)		
8.	a)	List out the advantages and limitations of using GT.	CO5	6 Marks
	b)	Describe the OPTIZ classification system generally used in group technology.	CO5	8 Marks

UNIT-V

9.	a)	Distinguish between Conventional manufacturing and CIM.	CO1	5 Marks
	b)	What are the various types of layouts used in FMS design? Explain briefly about their applications.	CO6	9 Marks
		(OR)		
10.	a)	What do you understand by the term flexibility in FMS? What are the various types of flexibilities that are relevant?	CO6	8 Marks
	b)	Distinguish between Contact and Non-contact Inspection methods.	CO6	6 Marks

❀ ❀ ❀

CODE No.: 16BT60302 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, June - 2022

HEAT TRANSFER
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What is Thermal Diffusivity? Explain its significance.	CO1	4 Marks
	b)	A surface having an area of 1.5 m^2 and maintained at 300ºC exchanges heat by radiation with another surface at 40^0C. The value of factor due to the geometric location and emissivity is 0.52. Determine: i) Heat lost by Radiation ii) The value of Thermal Resistance and iii) The value of equivalent convection coefficient.	CO5	10 Marks

(OR)

2.		Derive the general one-dimensional unsteady state heat conduction equation for a spherical body with internal heat generation. Simplify the obtained equation to Poisson's equation, Fourier's Equation and Laplace equation.	CO2	14 Marks

UNIT-II

3.		Fins, 12 in number, having K=75 W/m K and 0.75 mm thickness protrude 25mm from a cylindrical surface of 50mm diameter and 1 m length placed in an atmosphere of 40ºC. If the cylindrical surface is maintained at 150ºC and the heat transfer coefficient is 23 W/m²K Calculate: i) the rate of heat transfer ii) the percentage increase in heat transfer due to fins iii) the temperature at the centre of fins and iv) the fin efficiency and effectiveness.	CO3	14 Marks

(OR)

4.	a)	A solid copper sphere of 10 cm diameter, initially at a uniform temperature of 250 ºC, is suddenly immersed in a well-stirred fluid which is maintained at a uniform temperature of 50 ºC. The heat transfer coefficient between the sphere and the fluid is h= 200 W/m²K. Determine the temperature of the copper block at 5 minutes after immersion.	CO5	7 Marks
	b)	A semi-infinite slab of copper is exposed to a constant heat flux at the surface of 0.3 MW/m². Neglecting convection at the surface, Calculate the surface temperature after 10 minutes if the initial temperature of the slab is 30ºC. What is the temperature at a distance of 20 cm from the surface after 10 min? For copper K= 386W/m K, c_e= 0.404 m²/hr.	CO5	7 Marks

UNIT-III

5.	a)	Derive the general form of equation for natural convection heat transfer using dimensional analysis.	CO2	7 Marks
	b)	A horizontal plate 1 m x 0.8 m is kept in a water tank with the top surface at 60ºC providing heat to warm stagnant water at 20ºC. Determine the value of convection coefficient	CO2	7 Marks

(OR)

6.		Air at 20°C at atmospheric pressure flows over a flat plate at a velocity of 3 m/s. If the plate is 1 m wide and 80°C, calculate the following at x=300mm. i) Hydrodynamic boundary layer thickness, ii) Thermal boundary layer thickness, iii) Local friction coefficient, iv)Average friction coefficient, v) Local heat transfer coefficient vi)Average heat transfer coefficient, vii) Heat transfer.	CO2	14 Marks

UNIT-IV

7.	a)	Derive an expression for LMTD on the counter flow heat exchanger.	CO1	7 Marks
	b)	Explain the flow regimes in two phase flow through a tube. What is the difference between slug flow regime and annular flow region?	CO1	7 Marks

(OR)

8.		A shell and tube type steam condenser, employed in a large steam power plant, effects a heat exchange rate of 2200 MW. The condenser of a single pass shell and 32,000 tubes, each exceeding two passes. The water at the rate of 3.2 **x** 10^4 kg/sec passes through the tubes which are of thin wall and of diameter 30 m the steam condenser on the outer surface on the tubes. The heat transfer coefficient on the steam side may be taken as 11500 W/m²K. Steam condenses at 50ºC while water enters the condenser at 20ºC. Using LMTD correction factor method and NTU method, calculate the following: i) outlet temperature of cooling water. ii) length of tube per pass, take following properties of water: C_p = 4.18 kJ/ kgK, u = 855 **x** 10^{-6} N-sec/m^2 , K = 0.613 W/mK, P_r = 5.83.	CO5	14 Marks

UNIT-V

9.	a)	Distinguish between specular and diffuse surfaces.	CO1	7 Marks
	b)	Two large parallel planes with emissivities of 0.3 and 0.5 are maintained at temperatures of 800ºC and 300ºC respectively. Determine the net radiant heat exchange per unit area between the planes. If a radiation shield having an emissivity of 0.05 on both sides is placed between the two planes, calculate the temperature of the shield and the heat transfer rate per unit area.	CO2	7 Marks

(OR)

10.	a)	What is intensity of radiation? Prove that total emissive power is ***n***-times the intensity of radiation.	CO2	7 Marks
	b)	Two parallel plates 0.5 by 1.0 m are spaced 0.5 m apart. One plate is maintained at 1000ºC and the other at 500ºC. The emissivities of the plates are 0.2 and 0.5, respectively. The plates are located in a very large room, the walls of which are maintained at 30ºC. The plates exchange heat with each other and with the room, but only the plate surfaces facing each other are to be considered in the analysis. Find the net heat transfer to each plate and to the room.	CO2	7 Marks

❀ ❀ ❀

CODE No.: 16BT60303 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations June - 2022

NON-CONVENTIONAL ENERGY SOURCES

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Describe the main features of various types of renewable energy resources.	CO1	4 Marks
	b)	What's the difference between a pyranometer and pyrheliometer? Draw neat diagram and explain about pyrheliometer.	CO2	10 Marks
		(OR)		
2	a)	Explain the concept of total radiation on Tilted Surface.	CO2	6 Marks
	b)	Explain the following terms w.r.t solar radiation geometry: i) Zenith Angle. ii) Solar Azimuth angle. iii) Surface azimuth angle. iv) Sun Angle.	CO2	8 Marks

UNIT-II

3	a)	List and explain the factors that affect the performance of Flat plate collectors.	CO2	9 Marks
	b)	List the advantages of concentrating collector over flat collector.	CO2	5 Marks
		(OR)		
4	a)	Express heat lost from collector in terms of overall loss coefficient. Explain top loss coefficients in detail.	CO2	7 Marks
	b)	Draw a neat sketch of solar flat plate collector and explain its working principle.	CO2	7 Marks

UNIT-III

5	a)	With the help of neat sketch, describe a solar heating system using water heating Solar collectors. Give the advantages and disadvantages of this method.	CO3	8 Marks
	b)	Explain with a neat diagram the working of thermoelectric generator.	CO3	6 Marks
		(OR)		
6	a)	Describe the working of a solar photovoltaic cell. With help of a neat diagram, explain the working of solar photovoltaic power system.	CO3	8 Marks
	b)	With a neat sketch, explain space cooling system using liquid FPC.	CO3	6 Marks

UNIT-IV

7	a)	List and briefly explain the various parts of horizontal axis wind turbine.	CO3	8 Marks
	b)	Discuss about Betz limit.	CO1	6 Marks
		(OR)		
8	a)	What are the reactions phases that take place in a digester, explain them in detail?	CO2	6 Marks
	b)	With a neat sketch, explain biomass gasification.	CO2	8 Marks

UNIT-V

9	a)	With a neat sketch, explain the working of open cycle OTEC system.	CO5	7 Marks
	b)	List the advantages of geothermal energy over conventional energy sources and also explain its impact on Environment.	CO6	7 Marks
		(OR)		
10		Explain with sketches the various methods of tidal power generation. What are the limitations of each method?	CO3	14 Marks

CODE No.: 16BT60304 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations June - 2022

GAS TURBINES AND JET PROPULSION
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Illustrate the working of a constant pressure and a constant volume gas turbine.	CO1	8 Marks
	b)	What is total energy system incorporating gas turbine? Discuss its importance.	CO1	6 Marks

(OR)

2.		In a simple gas turbine plant air enters the compressor at 1 bar and 15^0C and leaves at 6 bar. It is then heated in the combustion chamber to 700^0C and then enters the turbine and expands to atmospheric pressure. The isentropic efficiency of compressor and turbine are 0.80 and 0.85 respectively and the combustion efficiency is 0.90. The fall in pressure through the combustion chamber is 0.1 bar. Determine: i) the thermal efficiency. ii) the work ratio. iii) the air rate in kg/hr. iv) SFC and v) Air fuel ratio.	CO1	14 Marks

UNIT-II

3.	a)	Define Isentropic and Polytropic efficiencies of dynamic compressors and obtain a relation between them.	CO2	6 Marks
	b)	In a single sided straight vaned rotary compressor is required to deliver 10 kg of air per second with a total pressure ratio of 4.5:1, and operates at a speed of 16000 r.p.m. The air inlet pressure and temperature are 1 bar and 27^0C. Find: i) rise in total temperature. ii) tip speed of impeller. iii) tip diameter.	CO2	8 Marks

(OR)

4.	a)	Discuss the various factors involved in the design of impellers.	CO2	10 Marks
	b)	A rotary compressor, having a pressure ratio 10:1, takes in 25 kg of air per second at 15^0C. Calculate the required power input in KW.	CO2	4 Marks

UNIT-III

5.	a)	Describe the flow pattern in a gas turbine combustion chamber.	CO3	8 Marks
	b)	What are the reasons for pressure losses in a combustion chamber? How they can be reduced?	CO3	6 Marks

(OR)

6.	a)	How combustion efficiency of a gas turbine combustion chamber is defined? What are the main factors on which it depends?	CO3	8 Marks
	b)	What are the main requirements of a gas turbine combustion chamber?	CO3	6 Marks

UNIT-IV

7.	a)	What is the difference between a turbo prop engine and a bypass engine? When a bypass engine would be preferred over a turboprop or turbojet engine?	CO4	6 Marks
	b)	When thrust augmentation is necessary in an aircraft engine? Briefly describe the various methods of thrust augmentation in a jet engine. For which applications these various methods are suitable?	CO4	8 Marks

(OR)

8.	a)	Draw a schematic diagram of a ramjet engine and describe its operation. What are its advantages and disadvantages?	CO4	8 Marks
	b)	A jet plane having 2 jets works on turbojet system. It flies at a speed of 800 km/hr at an altitude where the specific mass of air is 0.15 kg/m^3. The propulsive efficiency is 55%. The drag on the plane is 6500 kW. Calculate i) absolute velocity of jet. ii) quantity of air compressed. iii) diameter of jet.	CO4	6 Marks

UNIT-V

9.	a)	Derive a general expression for the thrust produced by a chemical rocket and hence discuss the importance of the molecular weight of the propellants.	CO5	8 Marks
	b)	What are the desirable requirements of a liquid propellant for rockets?	CO5	6 Marks

(OR)

10.	a)	Describe how nuclear energy can be used for propulsion of rockets.	CO5	8 Marks
	b)	What are the advantages and disadvantages of liquid propellant rockets over solid propellant rockets?	CO5	6 Marks

CODE No.: 16BT60401 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations June - 2022

ANTENNAS AND WAVEGUIDES
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Solve the wave equation for a rectangular wave-guide and obtain the solution for the field components of TM_{mn} mode of propagation.	CO3	7 Marks
	b)	Analyze the significance of the cut-off frequency, f_c of a wave-guide and show that λ_c, λ_g and λ are related by $\frac{1}{\lambda_c^2} + \frac{1}{\lambda_g^2} = \frac{1}{\lambda^2}$.	CO2	7 Marks

(OR)

2.	a)	What is dominant mode? Derive the expressions for β, f_c, λ_c, λ_g and v_p for the dominant mode of rectangular wave-guide.	CO1, CO2	7 Marks
	b)	Consider a parallel plane wave guide, for which the two conducting planes are placed at $x = 0$ and $x = a$. Solve the Maxwell's equations between the conducting planes to express E_x, E_y, H_x and H_y of the wave in terms of E_z and H_z and hence classify the waves in the wave-guide.	CO4	7 Marks

UNIT-II

3.	a)	Two Hertzian dipoles with horizontal orientation are placed at $z = \pm d/2$, and the excitation currents are $I_0\angle\alpha/2$ and $I_0\angle - \alpha/2$. Deduce an expression for the Array Factor and also calculate the radiation pattern of the array.	CO2	7 Marks
	b)	A lossless resonant Half-wave dipole antenna with an input impedance of 73Ω is to be connected to a transmission line whose characteristic impedance is 50Ω. Assuming that the radition intensity is given approximately by $U(\theta, \varphi) = A_0 \sin^3\theta$, calculate: *i*) the maximum gain of the antenna. *ii*) the total efficiency.	CO4	7 Marks

(OR)

4.	a)	A short dipole has its normalized field $E_n(\theta, \varphi) = \sin\theta$. Show that its maximum directivity $D_0 = 1.5$. If P_{rad} is the total power radiated by an antenna, show that $D_0 = (4\pi U(\theta, \varphi)/P_{rad})$. Comment on the directional characteristics of the antenna.	CO3, CO2	7 Marks
	b)	A uniform plane wave incidents on a very short lossless dipole ($l<<\lambda$), find the maximum effective aperture A_{em}, assuming that $R_r = 80\pi^2 (dl/\lambda)^2$ and incident field is lineally polarized.	CO2	7 Marks

UNIT-III

5.	a)	Given a linear, broadside, uniform array of 10 isotropic elements with separation of $d=\lambda/4$ between the elements, find the directivity of the array.	CO3	7 Marks
	b)	What is broad side array? Evaluate the expression for the radiation pattern for an end fire array of N identical elements.	CO1	7 Marks

(OR)

6.	a)	Design a four element ordinary end-fire array with the elements spacing along the *z*-axis a distance d apart. For a spacing of $d = \frac{\lambda}{2}$ between the elements find the: i) Progressive phase excitation between the elements. ii) Nulls. iii) Maximum Band-with between the nulls. iv) Directivity.	CO3	7 Marks
	b)	Prove that the directivity of an end-fire array of the point sources spaced distance d apart, is given by $D(\theta) = \frac{2}{1+\frac{\sin 2kd}{2kd}}$.	CO2	7 Marks

UNIT-IV

7.	a)	With a neat sketch justify how off-set feed mechanism avoids impedance mismatching and aperture blocking.	CO1	7 Marks
	b)	"In a parabolic reflector horn feed performs better than waveguide feed", justify this statement.	CO1	7 Marks

(OR)

8.	a)	Create a cassegrain feed for a parabolic reflector.	CO4	7 Marks
	b)	Suggest an antenna which covers curved wave front to plane wave front during transmission and vice versa during reception. Elaborate its functioning with neat sketches.	CO1	7 Marks

UNIT-V

9.	a)	Inferanechoic chamber measurement and illustrate the reciprocity in antenna measurements.	CO5	7 Marks
	b)	Demonstrate the compact antenna test ranges and near field ranges with neat diagrams.	CO1	7 Marks

(OR)

10.	a)	How the radiation pattern of an antenna are measured. Support with neat diagram.	CO5	7 Marks
	b)	Measurement of field strength and field pattern of a yagi uda array working at 850MHz band is required. What will be the far field at the testing antenna has to be setup? Explain the procedure with a neat diagram.	CO4	7 Marks

CODE No.: 16BT60402 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, June - 2022

DIGITAL SIGNAL PROCESSING

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit

All questions carry equal marks

UNIT-I

1.	a)	Determine the response of discrete time system given by difference $y(n) = -0.8y(n-1) + x(n)$. When the input is step and $y(-1) = 0$.	CO2	7 Marks
	b)	Define the symmetric and anti symmetric signals with examples.	CO1	7 Marks
		(OR)		
2.	a)	Check the following system described with difference equations for linearity, shift invariance, stability and causality: $y(n) + y(n+1) = nx(n)$.	CO2	7 Marks
	b)	Categories the classification of discrete time signals with examples.	CO1	7 Marks

UNIT-II

3.	a)	Develop the inverse FFT algorithm with neat sketch for N=8.	CO3	7 Marks
	b)	Determine linear convolution of $x(n) = \{1,1,2,2\}$ and $h(n) = \{1,2,1\}$ using DFT.	CO5	7 Marks
		(OR)		
4.	a)	Develop the DIT FFT algorithm with neat sketch for $N = 8$.	CO3	7 Marks
	b)	Contrast the transforms DTFT, DFS and DFT.	CO4	7 Marks

UNIT-III

5.	a)	For the system function $H(z) = \frac{(z^2 + z + 1)}{(z + 0.5)(z + 0.4)}$, obtain the parallel from of realization.	CO4	7 Marks
	b)	Discuss briefly about analog to analog transformation in analog filters.	CO1	7 Marks
		(OR)		
6.	a)	Interpret the advantages and disadvantage bilinear transformation.	CO4	7 Marks
	b)	Mention the important features of IIR filter.	CO1	7 Marks

UNIT-IV

7.	a)	Distinguish the window functions used in the design of FIR filters.	CO2	7 Marks
	b)	Prove that linear phase characteristics can be achieved if impulse response is symmetric with conditions $h(N-1-n) = h(n)$ centered at $\alpha = (N-1)/2$.	CO5	7 Marks
		(OR)		
8.	a)	Derive the frequency response of Linear phase FIR filter when impulse response is symmetric when N even no. samples.	CO2	7 Marks
	b)	Design a linear phase FIR lowpass filter with $Wc = 0.5\pi$ rad/sample by taking 11 samples of ideal frequency response using frequency sampling method.	CO5	7 Marks

UNIT-V

9.	a)	Write a short note on Memory Access schemes in P-DSPs.	CO1	7 Marks
	b)	Explain Von Neumann and Harvard architecture with a neat sketch.	CO1	7 Marks
		(OR)		
10.	a)	Discuss various techniques adapted for increasing the number of memory accesses/instruction cycle.	CO1	7 Marks
	b)	Discuss in detailed about pipelining of instruction execution in DSP processor.	CO1	7 Marks

❀ ❀ ❀

CODE No.: 16BT60404 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations June - 2022

IMAGE PROCESSING
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Explain the different components in digital image processing.	CO1	8 Marks
	b)	Explain the basic relationship between the pixels.	CO2	6 Marks
		(OR)		
2.	a)	Analyze the performance of Hadamard transforms.	CO1	7 Marks
	b)	Explain about spatial operations performed on images.	CO2	7 Marks
		UNIT-II		
3.	a)	Develop image enhancement by point processing method.	CO1	6 Marks
	b)	List and explain different grey level intensity transformation functions.	CO3	8 Marks
		(OR)		
4.	a)	Distinguish between spatial domain and frequency domain filters for image enhancement.	CO1	5 Marks
	b)	Define histogram? Explain the histogram equalization.	CO3	9 Marks
		UNIT-III		
5.	a)	Distinguish between image restoration & enhancement.	CO1	6 Marks
	b)	Define impulse noise and explain how to remove impulse noise from an image.	CO4	8 Marks
		(OR)		
6.	a)	How to estimate the degradation function using inverse filtering?	CO1	8 Marks
	b)	Write a short notes on: i) Order statistic filter. ii) Mean filter. iii) Adaptive filter.	CO4	6 Marks
		UNIT-IV		
7.	a)	Write a short notes on: i) Bit plane coding. ii) Transform basic coding.	CO5	6 Marks
	b)	Apply various techniques used in dictionary based compression and explain in detail.	CO1	8 Marks
		(OR)		
8.	a)	Define compression and what are the different types of compression techniques	CO5	9 Marks
	b)	Explain redundancy & fidelity criteria.	CO1	5 Marks
		UNIT-V		
9.	a)	Define segmentation. Explain detection of discontinuities.	CO5	9 Marks
	b)	Explain about region based segmentation.	CO6	5 Marks
		(OR)		
10.	a)	How to convert RGB to HSI color components?	CO5	6 Marks
	b)	Explain about pseudo color image compression.	CO6	8 Marks

CODE No.: 16BT60406 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations June - 2022

TELECOMMUNICATION SWITCHING SYSTEMS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Write about the classification of switching systems.	CO1	7 Marks
	b)	What are the components of a telecommunication network?	CO1	7 Marks
		(OR)		
2.	a)	Draw the circuit diagram of a half duplex telephone circuit and explain its operation.	CO1	7 Marks
	b)	Draw 3 x 3 crossbar switching and describe it.	CO1	7 Marks

UNIT-II

3.	a)	What are the factors that limits the maximum length of the subscriber loop?	CO2	7 Marks
	b)	Describe the methods used to decide the route for a particular connection.	CO2	7 Marks
		(OR)		
4.	a)	What is a subscriber loop interface and also mention the functions performed by it.	CO2	7 Marks
	b)	How to supress the echo in telecommunication networks?	CO2	7 Marks

UNIT-III

5.	a)	Describe the three forms of signalling involved in a telecommunication network.	CO3	7 Marks
	b)	Distinguish between inband and outband signalling techniques.	CO3	7 Marks
		(OR)		
6.	a)	Compare and contrast inchannel and common channel signalling.	CO3	7 Marks
	b)	Draw and explain the formats of SUM and MUM.	CO3	7 Marks

UNIT-IV

7.	a)	What are the issues involved in data communication using PSTN?	CO4	7 Marks
	b)	What is circuit switching and describe it in detail about phases involved in data transfer?	CO4	7 Marks
		(OR)		
8.	a)	What are the new services available in ISDN?	CO4	7 Marks
	b)	How to transfer data via ATM?	CO4	7 Marks

UNIT-V

9.	a)	What are the advantages of ADSL?	CO5	7 Marks
	b)	Draw and describe the cable TV network.	CO5	7 Marks
		(OR)		
10.	a)	What are the components of HFC network?	CO5	7 Marks
	b)	Draw and describe the SONET layers.	CO5	7 Marks

CODE No.: 16BT60409 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations June - 2022

LIGHT WAVE COMMUNICATIONS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define an optical fiber. Explain in detail different types of optical fibers giving neat sketches.	CO1	7 Marks
	b)	A silica glass fibers has a core refractive index of 1.5 and the cladding refractive index of 1.45 then calculate the critical angle and the percentage of power collected by the fiber?	CO1	7 Marks
		(OR)		
2.	a)	Explain about graded index fibers with diagrams.	CO1	6 Marks
	b)	A Graded index fiber with parabolic refractive index at the core axis is 1.5 and relative index difference is 1%. Estimate the maximum possible core diameter in single mode operation at wavelength 1.3mm?	CO4	8 Marks

UNIT-II

3.	a)	Explain the material dispersion in optical fibers.	CO2	7 Marks
	b)	Define and explain the linear polarized modes in optical fiber.	CO4	7 Marks
		(OR)		
4.	a)	Explain stimulated Brillouin scattering and stimulated raman scattering.	CO4	7 Marks
	b)	Write short notes on bending losses and explain how to overcome the losses.	CO4	7 Marks

UNIT-III

5.	a)	Derive the expression for threshold condition in laser oscillator.	CO1	5 Marks
	b)	The minority carrier recombination lifetime of an LED IS 5ns. When a constant d.c drive current is applied to the device the optical output power is 300μW. Determine the optical output power when the device is modulated with an rms drive current corresponding to the d.c drive current at frequencies of (i)200Mhz (ii)100Mhz	CO3	9 Marks
		(OR)		
6.	a)	Explain quantum efficiency and the responsitivity of the optical detectors.	CO3	6 Marks
	b)	Draw the structures of PIN and APD photo detectors and explain their operations.	CO1	8 Marks

UNIT-IV

7.	a)	Describe lensing mechanisms to improve coupling efficiency between source and a fiber.	CO1	7 Marks
	b)	Explain about straight sleeve connectors.	CO1	7 Marks
		(OR)		
8.	a)	Discuss the source output pattern of a fiber.	CO3	7 Marks
	b)	Define splices and explain about the different types of splices.	CO1	7 Marks

UNIT-V

9.	a)	Derive an expression for the total system rise time budget in terms of transmitter and receiver fiber rise time.	CO5	7 Marks
	b)	calculate the system rise time of a 6KM fiber optic link with the following specifications, rise time of the LED and its drive electronics is 12ns, material dispersion related rise time degradation is 24ns, bandwidth of the optical receiver 20Mhz, bandwidth distance product of the fiber 400 Mhz-Km and mode mixing Factor 'q' over 6Km fiber is 1.0.	CO5	7 Marks

(OR)

10.	a)	Discuss the component choices a system designer has when selecting components for an optical fiber communication systems.	CO5	7 Marks
	b)	Explain in detail about SONET/SDH rings.	CO5	7 Marks

CODE No.: 16BT60501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, June - 2022

SOFTWARE TESTING

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define early testing. List the benefits of early testing.	CO1	7 Marks
	b)	What is the psychology behind testing by an independent team?	CO6	7 Marks
		(OR)		
2.	a)	Compare manual testing and automated testing.	CO2	8 Marks
	b)	Define test strategy matrix. Explain.	CO1	6 Marks

UNIT-II

3.	a)	What is loop testing? Explain various loops.	CO1	8 Marks
	b)	Explain data flow testing in detail.	CO1	6 Marks
		(OR)		
4.	a)	Differentiate statement coverage and condition coverage	CO2	8 Marks
	b)	Explain multiple condition coverage.	CO1	6 Marks

UNIT-III

5.	a)	List the steps involved in deriving test cases using cause effect graphing based testing.	CO2	7 Marks
	b)	Derive the test cases for the following scenario. "A program has been designed to determine the nature of roots of a quadratic equation. The quadratic equation takes three input values from the range [0, 100]."	CO3	7 Marks
		(OR)		
6.	a)	Design a finite state machine which accepts "aabb" character sequence in a given text.	CO3	7 Marks
	b)	Write an algorithm that simulates the behavior of finite state machine.	CO1	7 Marks

UNIT-IV

7.		Test the Auto Teller Machine software by developing the following. i) Unit test plan ii) Integration test plan iii) System test plan.	CO6	14 Marks
		(OR)		
8.		Consider a project with the following components: EI (Simple) = 30, EO(average) = 20, EQ(average)=35, ILF(complex)=8, ELF(complex)=05. In addition, the system requires significant end-user efficiency, moderate distributed data processing, critical data communications, and other GSCs are incidental. Compute the function points for this system using FPA.	CO4	14 Marks

UNIT-V

9.	a)	Explain the need for automated testing tools.	CO1	7 Marks
	b)	Illustrate the steps involved in selection of testing tools.	CO2	7 Marks
		(OR)		
10.		Draw and discuss the analysis and design models for any web application.	CO5	14 Marks

CODE No.: 16BT60503 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations June - 2022

WIRELESS NETWORKS
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Illustrate with a neat sketch about PSTN and its extensions to cellular telephone services.	CO1	10 Marks
	b)	List and explain the uses of wireless networks in various market sectors.	CO5	4 Marks
		(OR)		
2.	a)	Compare and Contrast 1G and 2G wireless standards.	CO2	10 Marks
	b)	Write about wireless LAN standards.	CO1	4 Marks
		UNIT-II		
3.	a)	List and explain in detail various security requirements for wireless networks.	CO2	7 Marks
	b)	Compare and contrast various wireless Network Topologies.	CO2	7 Marks
		(OR)		
4.	a)	Write in detail about Cell Fundamentals.	CO1	5 Marks
	b)	Explain in keen about Location and Handoff Management.	CO2	9 Marks
		UNIT-III		
5.	a)	Explain in detail about Carrier sensing and its importance.	CO1	7 Marks
	b)	Illustrate with a neat sketch general MAC frame format.	CO2	7 Marks
		(OR)		
6.	a)	Explain the physical specification of FHSS.	CO1	7 Marks
	b)	Compare and Contrast between 802.11a and 802.11b.	CO3	7 Marks
		UNIT-IV		
7.	a)	Briefly explain SMS operation.	CO2	7 Marks
	b)	With a neat Sketch explain forward CDMA channel.	CO1	7 Marks
		(OR)		
8.	a)	Explain in detail about IS-95 frame format.	CO2	7 Marks
	b)	Brief about wireless application Protocol.	CO1	7 Marks
		UNIT-V		
9.	a)	Brief about HOME-RF.	CO1	7 Marks
	b)	List and Explain the requirements and basic architecture of HYPER LAN.	CO2	7 Marks
		(OR)		
10.	a)	Classify SWAN and WAND WATM Systems.	CO2	7 Marks
	b)	Explain in keen the architecture of Bluetooth.	CO1	7 Marks

CODE No.: 16BT61001 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations June - 2022

ARM PROCESSORS AND PIC MICROCONTROLEERS

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain architecture of PIC 18 with a suitable block diagram.	CO4	7 Marks
	b)	Explain Branch, call and time delay instructions of PIC with example.	CO2	7 Marks
		(OR)		
2.	a)	Differentiate between microprocessor and microcontroller.	CO4	7 Marks
	b)	Write PIC to toggle bits of port B, Port C and port D continuously with delay.	CO1	7 Marks

UNIT-II

3.	a)	Describe the different DB9 pins used for handshaking in RS232.	CO1	7 Marks
	b)	Select appropriate clock frequency and timer in require mode, write a program in assembly to generate a square wave on Port A Pin1 using timer with a duty cycle of 40 % with and without interrupt.	CO5	7 Marks
		(OR)		
4.	a)	Write a program to read Port A and transmit serially using interrupts with clock Frequency of 10MHz and baud rate of 9600.	CO5	7 Marks
	b)	Explain the interrupt mechanism, types and priority of PIC microcontroller.	CO1	7 Marks

UNIT-III

5.	a)	Draw interfacing diagram of 16x2 LCD with PIC 18Fxx microcontroller, and explain function of each pin of LCD panel.	CO3	7 Marks
	b)	Design an interfacing circuit and program to convert an analog signal connected to channel 2 into a digital signal.	CO3	7 Marks
		(OR)		
6.	a)	With a neat circuit diagram explain how a 4 x 4 keypad is interfaced with PIC microcontroller and write ALP for keypad scanning.	CO6	7 Marks
	b)	Write a program to rotate the stepper motor by an angle of 180 Degrees. Assume step size of 1.8 Degrees.	CO4	7 Marks

UNIT-IV

7.	a)	List the registers present in different exception modes of ARM cortex M3 and explain the functionality of them.	CO1	7 Marks
	b)	Explain about the exception support of ARM cortex M3.	CO4	7 Marks
		(OR)		
8.	a)	Give the important features and applications of ARM cortex M3.	CO1	7 Marks
	b)	Describe various registers available in ARM cortex M3 processor.	CO2	7 Marks

UNIT-V

9.	a)	Explain the concept of pre-indexing, auto indexing and post indexing with suitable examples.	CO1	7 Marks
	b)	Explain data processing arithmetic instructions with examples.	CO4	7 Marks
		(OR)		
10.	a)	Illustrate the Combined Compare and Conditional Branch instruction with examples.	CO1	7 Marks
	b)	Write an ALP to perform multiplication of two numbers in arm mode and then switch to thumb mode to perform addition.	CO2	7 Marks

❀ ❀ ❀

CODE No.: 16BT61005 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations June - 2022

OPTO-ELECTRONICS AND LASER INSTRUMENTATION
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define an optical fiber. Explain in detail different types of optical fibers with neat sketches.	CO1	7 Marks
	b)	Explain p-i-n photo detector with neat sketch.	CO1	7 Marks
		(OR)		
2.	a)	What are the need of connectors and the principle requirements of a connectors design?	CO1	7 Marks
	b)	What is the significance of total internal reflection and numerical aperture of an optical fiber?	CO1	7 Marks

UNIT-II

3.	a)	Explain the block diagram of basic optical fiber sensor system.	CO1	7 Marks
	b)	Describe in detail the principle of measurement of pressure and temperature using fiber optic sensors.	CO3	7 Marks
		(OR)		
4.		Explain the operation of: i) optical fluid level detector. ii) optical reflective type displacement sensor. iii) ring interferometer with multiturnfiber coil.	CO1	14 Marks

UNIT-III

5.	a)	List the properties of lasers and how it fulfills the major requirements for an optical fiber emitter.	CO1	7 Marks
	b)	Derive Einstein relation for the rates of the three transition process of absorption, spontaneous emission and simulated emission for two level atomic systems.	CO1	7 Marks
		(OR)		
6.	a)	Explain about: i) Population inversion. ii) Optical feedback and laser oscillation.	CO3	7 Marks
	b)	Explain about the operation of Q switching in detail.	CO5	7 Marks

UNIT-IV

7.	a)	Explain about material processing using laser.	CO2	7 Marks
	b)	Explain about: i) Laser welding. ii) Laser cutting. iii) Laser drilling.	CO6	7 Marks
		(OR)		

8.	a)	Explain how laser is used in material processing and also explain laser heating process	CO6	7 Marks
	b)	How the distance is measured by Michaelson interferometry using laser?.	CO6	7 Marks

UNIT-V

9.	a)	Explain about any three scientific applications of holography.	CO1	7 Marks
	b)	Explain the principle and operation of magneto optic modulator with a neat diagram.	CO1	7 Marks

(OR)

10.	a)	Describe the construction and reconstruction of hologram.	CO1	7 Marks
	b)	List the use of holography.	CO1	7 Marks

CODE No.: 16BT61006 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations June - 2022

AIRCRAFT INSTRUMENTATION
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Give a brief account on display colour and markings, instrument grouping.	CO1	7 Marks
	b)	Give a brief account on Aircraft instruments and their layout.	CO1	7 Marks
		(OR)		
2.	a)	Discuss about horizontal situation indicator.	CO1	7 Marks
	b)	What are the secondary control surfaces and their functionalities?	CO2	7 Marks

UNIT-II

3.		Give a brief account on International Standard Atmosphere (ISA).	CO1	14 Marks
		(OR)		
4.		Explain with a neat diagram how the combined pitot-static tube is used to measure the total static and dynamic pressures in an aircraft.	CO1	14 Marks

UNIT-III

5.		Analyse the principle and working of vibrating gyros.	CO4	14 Marks
		(OR)		
6.		Discuss about basic mechanical gyros and its properties.	CO4	14 Marks

UNIT-IV

7.	a)	With an appropriate diagram, describe the operation of electronic torque meter.	CO5	10 Marks
	b)	Calculate the horse power. If the speed of an engine is 1800 rpm and torque is 4000 ft-lbs.	CO1	4 Marks
		(OR)		
8.	a)	Give a brief account about non-contact type tacho probe.	CO1	7 Marks
	b)	With a neat diagram, explain about operation of optical tachometer.	CO1	7 Marks

UNIT-V

9.		Explain in detail about flight director system with suitable diagrams.	CO1	14 Marks
		(OR)		
10.		Explain in detail about altitude director indicator.	CO1	14 Marks

CODE No.: 16BT61205 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations June - 2022

CYBER SECURITY AND LAWS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What do you mean by cyber crime? Discuss the nature and types of cyber crime. Explain its challenges.	CO2	9 Marks
	b)	What is Social Engineering? How to prevent it?	CO1	5 Marks
		(OR)		
2.	a)	Discuss about monetary penalties, adjudication and appeals under IT Act 2000.	CO2	10 Marks
	b)	Explain in detail about botnets with an example.	CO1	4 Marks

UNIT-II

3.		Explain the terms: Phishing, Spyware, Steganography, Trojan Horses.	CO3	14 Marks
		(OR)		
4.	a)	Demonstrate about the password cracking Process.	CO3	5 Marks
	b)	Discuss in detail about DoS and DDoS Attacks.	CO1	9 Marks

UNIT-III

5.	a)	Discuss about the consequences of not addressing weaknesses in the IT act.	CO1	6 Marks
	b)	What is meant by Digital Signature? Explain its impact in IT Act.	CO1	8 Marks
		(OR)		
6.	a)	Briefly describe the challenges to Indian Law in cyber crime scenario.	CO1	7 Marks
	b)	Give detailed description about cyber laws in Indian context.	CO1	7 Marks

UNIT-IV

7.	a)	Explain in detail about Security and privacy implications of cloud Computing.	CO6	7 Marks
	b)	Explain the Organizational Guidelines for Safe Computing.	CO6	7 Marks
		(OR)		
8.		Describe the fair information practices in the context of cookie usage in the website design.	CO4	14 Marks

UNIT-V

9.	a)	Discuss in detail about intellectual property in the cyber space.	CO5	7 Marks
	b)	What are the main reasons that motivates a hacker to target any business.	CO1	7 Marks
		(OR)		
10.	a)	Illustrate about cyber terrorism with reference to parliament attack.	CO2	8 Marks
	b)	Discuss about Ethical hacking and Hactivism in detail.	CO3	6 Marks

CODE No.: 16BT61501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations June - 2022

DATA WAREHOUSING AND DATA MINING
[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Draw and explain the components of Data Warehouse Architecture.	CO1	7 Marks
	b)	Differentiate OLTP and OLAP.	CO1	7 Marks
		(OR)		
2.	a)	What is multi-dimensional data model? Explain its concept.	CO2	7 Marks
	b)	Discuss about ROLAP, MOLAP, and HOLAP.	CO1	7 Marks

UNIT-II

3.		Discuss in detail about the major issues in Data Mining and its functionalities.	CO4	14 Marks
		(OR)		
4.		What is data pre-processing? Explain why it is essential to pre-process the data before mining. Explain in detail about various preprocessing techniques.	CO3	14 Marks

UNIT-III

5.	a)	Write and explain APRIORI algorithm with a suitable example.	CO4	7 Marks
	b)	Describe the concept of Multilevel and multidimensional Association rule mining.	CO2	7 Marks
		(OR)		
6.	a)	Write and explain decision tree induction algorithm.	CO3	7 Marks
	b)	What is pruning? Discuss about various pruning techniques.	CO1	7 Marks

UNIT-IV

7.	a)	Discuss about different data types used in cluster analysis.	CO2	7 Marks
	b)	What is an outlier? Describe various outlier handling methods.	CO4	7 Marks
		(OR)		
8.		Explain the following clustering techniques. i) K-Means. ii) DBSCAN.	CO1	14 Marks

UNIT-V

9.	a)	Describe complex data types used in data mining.	CO4	8 Marks
	b)	Explain the concept of sequence mining.	CO4	6 Marks
		(OR)		
10.	a)	Explain the characteristics of multimedia mining.	CO4	7 Marks
	b)	Explain how web mining is different from text mining.	CO6	7 Marks

CODE No.: 16BT71205 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations June - 2022

CRYPTOGRAPHY AND NETWORK SECURITY

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Apply Caesar cipher and k=5 decrypt the given Cipher text "YMJTYMJWXNIJTKXNQJSHJ".	CO3	7 Marks
	b)	Describe in detail about the types of cryptanalytic attack.	CO2	7 Marks
		(OR)		
2.	a)	Differentiate between transposition cipher and substitution cipher. Apply two stage transpositions Cipher on the "treat diagrams as single units" using the keyword "sequence".	CO1	7 Marks
	b)	Solve using Playfair cipher. Encrypt the word "SREE VIDYANIKETHANENGINEERING COLLEGE" with the keyword "MOHANBABU". List the rules used.	CO3	7 Marks

UNIT-II

3.	a)	Formulate the single round of DES algorithm.	CO1	7 Marks
	b)	Summarize the role of discrete log in the Diffie-Hellman key exchange in exchanging the secret key among two users.	CO1	7 Marks
		(OR)		
4.	a)	How AES is used for encryption/Decryption? Discuss with example.	CO1	7 Marks
	b)	Estimate the encryption and decryption values for the RSA algorithm parameters. P=7, Q=11, E=17, M=8.	CO3	7 Marks

UNIT-III

5.	a)	Compare the features of SHA and MD5 algorithm.	CO2	7 Marks
	b)	Summarize CMAC algorithm and its usage.	CO2	7 Marks
		(OR)		
6.	a)	Discuss about the objectives of HMAC and its security features.	CO1	7 Marks
	b)	Describe the authentication protocol and list its limitations, how the limitations overcome.	CO1	7 Marks

UNIT-IV

7.	a)	Discover how ESP is applied to both transport and tunnel modes in IP.	CO1	7 Marks
	b)	Demonstrate secure Electronic Transaction with neat diagram.	CO5	7 Marks
		(OR)		
8.	a)	What is the need for security in IP networks?	CO3	7 Marks
	b)	Describe the IPv6 authentication header.	CO6	7 Marks

UNIT-V

9.	a)	Discuss the role of intrusion detection system. What are the three benefits that can be provided by the intrusion detection system?	CO1	7 Marks
	b)	Discuss the architecture of distributed intrusion detection system with the necessary diagrams.	CO1	7 Marks
		(OR)		
10.	a)	Discover the participants of SET system and explain in detail.	CO5	7 Marks
	b)	Illustrate the Trojan Horse Defence in trusted system.	CO1	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

MANAGERIAL ECONOMICS AND PRINCIPLES OF ACCOUNTANCY

[Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. "Managerial Economics is the discipline which deals with the application of business management". Discuss. CO1 14 Marks

(OR)

2. What is elasticity of demand? Explain different types of price elasticity of demand. CO2 14 Marks

UNIT-II

3. Define production function. How does a long run production function differ from short run production function? CO1. CO3 14 Marks

(OR)

4. From the following information calculate: CO2 14 Marks
   i) P/V Ratio.
   ii) Break Even Point.
   iii) Margin of Safety.
   iv) Sales require to earn a profit of Rs. 2,40,000.

Particulars	Rs.
Total Sales	6,00,000
Selling price per unit	150
Variable cost per unit	90
Fixed costs	1,80,000

UNIT-III

5. Explain the various features of a perfectly competitive market. How is price of a commodity determined under it? CO1, CO2 14 Marks

(OR)

6. How are price and output determined under monopoly? Show that under monopoly, price is higher and output smaller than under perfect competition. CO2 14 Marks

UNIT-IV

7. What is Accounting? What are the accounting concepts and conventions? Explain any two accounting concepts in detail. CO1, CO4 14 Marks

(OR)

8. From the following transactions write Journal entries into the books of Purohith CO3 14 Marks

Date	Particulars	Rs.
2018 April 5	Started Business with Capital	2,00,000
April 9	Sold goods to Mudiliar on credit	60,000
April 10	Sold goods to Aswathama for cash	40,000
April 13	Goods returned by Mudiliar	2,200
April 17	Purchased goods from Madhu on credit	45,000
April 18	Goods returned to Madhu	1,000
April 24	Paid cash to Madhu	44,000

UNIT-V

9. Explain the role of computerized accounting system in modern business organizations. CO3, CO4 14 Marks

(OR)

10. From the following Trail Balance of Gowham, prepare Trading Account, Profit and Loss Account for year ending 31st March 2017 and Balance Sheet as on date. CO5 14 Marks

Trail Balance as on 31st March, 2017

Particulars	Dr. Rs	Cr. Rs
Buildings	20,000	
Capital		60,000
Purchases and Sales	10,000	30,000
Opening stock (1-4-2016)	5,000	
Debtors and Creditors	12,000	6,000
Drawings account	4,000	
Sales returns and Purchase returns	2,000	500
Freight	2,500	
Office Salaries	8,000	
Wages	1,500	
Postage and Telegrams	1,000	
Machinery	15,000	
Bills Receivables & Bills Payables	8,000	2,000
Advertisement	2,000	
Cash in Hand	3,500	
Loose Tools	4,000	
Total	**98,500**	**98,500**

Adjustments:

1. Closing stock valued at Rs. 6,00/-
2. Depreciation on Buildings by 10% and Loose Tools by 20%.
3. Interest on Capital at 10%.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

MANAGEMENT SCIENCE

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss in detail the various functions of management.	CO3	7 Marks
	b)	What are the Social responsibilities of Management?	CO1	7 Marks
		(OR)		
2.	a)	Explain about the elements of corporate planning process.	CO2	7 Marks
	b)	Elaborate the different types of organizations with examples.	CO3	7 Marks

UNIT-II

3.	a)	Describe the principle and types of plant layout.	CO2	7 Marks
	b)	Describe the concept of ABC analysis in detail.	CO2	7 Marks
		(OR)		
4.		What do you mean by work study? Explain the basic procedure involved in method study and work measurement.	CO4	14 Marks

UNIT-III

5.	a)	Explain about the Herzberg two factor theory of motivation.	CO3	7 Marks
	b)	Explain in detail any four methods of Job evaluation.	CO3	7 Marks
		(OR)		
6.	a)	Define HRM. Explain the nature and functions of HRM.	CO4	7 Marks
	b)	Explain the role of merit rating in HRM.	CO3	7 Marks

UNIT-IV

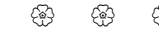
7.	a)	What do you understand by Project crashing?	CO4	7 Marks
	b)	Explain the differences between entrepreneur and manager.	CO4	7 Marks
		(OR)		
8.		Consider a project consisting of nine jobs with the following precedence relations and average time estimates.	CO5	14 Marks

Job	Predecessor	Time (Days)
A	-	30
B	-	20
C	A, B	20
D	A, B	20
E	B	10
F	D, E	10
G	C, F	40
H	D, E	20
I	G, H	30

Draw the project network, Identify the critical path and variance.

UNIT-V

9.	a)	Explain how Just-In-Time (JIT) has changed production environment.	CO5	7 Marks
	b)	Briefly explain Enterprise Resource Planning.	CO3	7 Marks
		(OR)		
10.	a)	Explain about the supply chain management.	CO5	7 Marks
	b)	Elaborate the concept of six sigma with examples.	CO3	7 Marks



CODE No.: 16BT6HS10 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

INDIAN HISTORY

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	What are the nonliterary sources describing about Indian history and explain briefly about inscriptions and numismatics.	CO1	14 Marks
	(OR)		
2.	Describe the principles of community origination and draw the conclusions from sociological concepts.	CO2	14 Marks

UNIT-II

3.	Explain the importance of Great bath in Mohenjodaro and its construction features.	CO1	14 Marks
	(OR)		
4.	What are the edits of Asoka and briefly narrate them.	CO1	14 Marks

UNIT-III

5.	Name any two rulers ruled the southern states and explain about them briefly.	CO2	14 Marks
	(OR)		
6.	How the Moghul empire disappeared in India and write salient feature Akbar ruling?	CO2	14 Marks

UNIT-IV

7.	Explain various steps taken by British to improve the industry sector in India.	CO3	14 Marks
	(OR)		
8.	How Muslims are separated in the war of independence and how they are provoked by Walli?	CO2	14 Marks

UNIT-V

9.	What do you mean by social exclusion and explain its importance in Indian context?	CO2	14 Marks
	(OR)		
10.	Communalism and secularism are part of India. Explain.	CO2	14 Marks

CODE No.: 16BT6HS11 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

PERSONALITY DEVELOPMENT

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.		"Moral compass plays a vital role in making difficult decisions". Describe.	CO1	14 Marks
		(OR)		
2.	a)	"Wearing a mask is the right thing to do". Describe.	CO1	7 Marks
	b)	List out the strategies to improve yourself.	CO1	7 Marks
		UNIT-II		
3.		Attitudes are learned with careful step-by-step instruction- Examine.	CO2	14 Marks
		(OR)		
4.	a)	Classify the consequences for the people who have positive and negative attitudes.	CO2	7 Marks
	b)	Discover a few situations that show the influence of person's attitude on others.	CO2	7 Marks
		UNIT-III		
5.		"Thinking skills can be developed". Illustrate.	CO3	14 Marks
		(OR)		
6.	a)	Employers want people who can think. Draw out different strategies.	CO3	7 Marks
	b)	Show some important ways to handle stress management.	CO3	7 Marks
		UNIT-IV		
7.		Prepare the procedure you adapt to present a problem with your supervisor.	CO4	14 Marks
		(OR)		
8.	a)	What personal qualities do you need to work well under the supervision of a Laiser-Faire Leader?	CO4	7 Marks
	b)	Construct a few strategies to develop an effective relationship with your supervisor.	CO4	7 Marks
		UNIT-V		
9.		Evaluate your personal characteristics to exhibit on the job to keep your position.	CO5	14 Marks
		(OR)		
10.	a)	"Sharing your goals with others helps in achieving them". Evaluate.	CO5	7 Marks
	b)	"Visualization plays a vital role for the success in your career". Justify.	CO5	7 Marks

CODE No.: 16BT30503 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

PYTHON PROGRAMMING
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Write notes on Python Standard Library.	CO1	7 Marks
	b)	Write a simple Python program that prompts the user for a certain number of cities for the Traveling Salesman problem and displays the total number of possible routes that can be taken. Your program should function as shown below. How many cities? 10 For 10 cities, there are 3628800 possible routes.	CO1, CO3	7 Marks
		(OR)		
2.	a)	Write a Python program that prompts the user to enter an upper or lower case letter and displays the corresponding Unicode encoding.	CO1, CO3	7 Marks
	b)	Algorithms and computers are a "perfect match". Justify.	CO1	7 Marks

UNIT-II

3.	a)	Write a brief notes on relational, membership and boolean operators along with suitable examples.	CO1	7 Marks
	b)	Write a Python program in which a student enters the number of college credits earned. If the number of credits is greater than 90, 'Senior Status' is displayed; if greater than 60, 'Junior Status' is displayed; if greater than 30, 'Sophomore Status' is displayed; else, 'Freshman Status' is displayed.	CO1-CO3	7 Marks
		(OR)		
4.	a)	Create a dictionary named member table that contains users' email addresses as keys and their current password as the values. Write a function that generates a temporary new password for a given user and updates it in the table.	CO1-CO3	7 Marks
	b)	Elaborate on dictionaries in Python, Set and Frozenset Types in Python.	CO1, CO3	7 Marks

UNIT-III

5.	a)	Write a Python function named modCount that is given a positive integer, n, and a second positive integer, m <= n, and returns how many numbers between 1 and n are evenly divisible by m.	CO1-CO3	7 Marks
	b)	Write notes on String Methods in Python.	CO1	7 Marks
		(OR)		
6.	a)	Write a python program segment that opens and reads a text file and displays how many lines of text are in the file.	CO1, CO3	7 Marks
	b)	Write a python program segment that reads a text file named original_text and displays how many times the letter 'e' occurs.	CO1, CO3, CO5	7 Marks

UNIT-IV

7.	a)	Discuss the fundamental turtle attributes and behavior.	CO1	7 Marks
	b)	Using relative positioning, give a set of instructions for controlling the turtle to draw an isosceles triangle on the screen (that is, a triangle with two equal-length sides).	CO1, CO4, CO5	7 Marks
		(OR)		
8.	a)	Describe what it means for a member of a class to be Private and to be Public. How to denote Public and Private Class Members in Python?	CO1, CO3	7 Marks
	b)	Implement a class named AvgList as a subclass of the built-in list class in Python, able to compute the average of a list of numeric values. If the list contains any nonnumeric types, a ValueError exception should be raised.	CO1, CO3-CO5	7 Marks

UNIT-V

9.	a)	Briefly Discuss tkinter Extensions.	CO4, CO5	7 Marks
	b)	With the aid of suitable examples, illustrate binding events.	CO5	7 Marks
		(OR)		
10.		Elaborate on reusable GUI components with classes.	CO5	14 Marks

CODE No.: 16BT40502 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

DATABASE MANAGEMENT SYSTEMS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Differentiate between DDL and DML with examples.	CO1	7 Marks
	b)	Discuss different notations used in ER model. Draw ER model for university database.	CO1	7 Marks
		(OR)		
2.	a)	Describe different types of users involved in database.	CO1	7 Marks
	b)	With a neat diagram, illustrate database architecture.	CO3	7 Marks

UNIT-II

3.	a)	Consider the following relations for a database that keeps track of automobile sales in a car dealership (OPTION refers to some optional equipment installed on an automobile): CAR(Serial_no, Model, Manufacturer, Price) OPTION(Serial_no, Option_name, Price) SALE(Salesperson_id, Serial_no, Date, Sale_price) SALESPERSON(Salesperson_id, Name, Phone) First, specify the foreign keys for this schema, stating any assumptions you make. Next, populate the relations with a few sample tuples, and then give an example of an insertion in the SALE and SALESPERSON relations that *violates* the referential integrity constraints and of another insertion that does not.	CO2	7 Marks
	b)	Discuss in detail the operators SELECT, PROJECT and UNION with suitable examples.	CO3	7 Marks
		(OR)		
4.	a)	What is Relational Calculus? Interpret Tuple and Domain Relation Calculus.	CO3	7 Marks
	b)	Define Logical database design. Classify the properties of a Relational Algebra.	CO4	7 Marks

UNIT-III

5.	a)	Consider the table employee (empId, name, department, salary). Assuming that department 5 has more than one employee. Write an SQL query to find the employees who get higher salary than anyone in the department 5.	CO2	7 Marks
	b)	State and explain different Aggregate functions in SQL.	CO4	7 Marks
		(OR)		
6.	a)	Define normalization. Explain 1*NF*, 2*NF*, 3*NF* Normal Forms.	CO1	7 Marks
	b)	Consider the relation scheme $R = (E, F, G, H, I, J, K, L, M, N)$ and the set of functional dependencies: $\{E, F\}\rightarrow\{G\}$, $\{F\}\rightarrow\{I,J\}$, $\{E,H\}\rightarrow\{K,L\}$, $\{K\}\rightarrow\{M\}$, $\{L\}\rightarrow\{N\}\}$ on R. What is the minimal key for R?	CO6	7 Marks

UNIT-IV

7.	a)	Briefly explain ACID property with an example.	CO3	7 Marks
	b)	Demonstrate testing for serializability with suitable example.	CO4	7 Marks

(OR)

8.	a)	Illustrate concurrent execution of transaction with examples.	CO3	7 Marks
	b)	Explain the following protocols for concurrency control: i) Lock-based protocols. ii) Time stamp based protocols.	CO4	7 Marks

UNIT-V

9.	a)	Differentiate between clustered and unclustered indexes.	CO5	7 Marks
	b)	A PARTS file with Part# as the key field includes records with the following Part# values: 23, 65, 37, 60, 46, 92, 48, 71, 56, 59, 18, 21, 10, 74, 78, 15, 16, 20, 24, 28, 39, 43, 47, 50, 69, 75, 8, 49, 33, 38. Suppose that the search field values are inserted in the given order in a B+-tree of order $p = 4$ and p leaf = 3; show how the tree will expand and what the final tree will look like.	CO6	7 Marks

(OR)

10.	a)	How can hashing be used to construct an index? Explain.	CO5	7 Marks
	b)	Write short notes on Indexed Sequential Access Methods (ISAM).	CO1	7 Marks

CODE No.: 16BT50308 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

MECHATRONICS
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Define the term Mechatronics. Describe the key elements of the Mechatronics System.	CO1	14 Marks
		(OR)		
2.		Define the term feedback control system. Describe the characteristics of feedback control system.	CO1	14 Marks

UNIT-II

3.	a)	Explain the working principle of LVDT.	CO2	10 Marks
	b)	Explain the principle of light sensor.	CO2	4 Marks
		(OR)		
4.		Explain the principle of operation and characteristics of DC motor.	CO2	14 Marks

UNIT-III

5.		With a diagram, explain any two operational amplifiers.	CO3	14 Marks
		(OR)		
6.	a)	What do you mean by converters? Explain any one analog to digital converters.	CO3	8 Marks
	b)	With circuit, explain current to voltage circuit.	CO3	6 Marks

UNIT-IV

7.	a)	Explain proportional controller with application.	CO4	8 Marks
	b)	Explain the procedure to select controller.	CO4	6 Marks
		(OR)		
8.	a)	What is composite controller mode?	CO4	7 Marks
	b)	Explain adaptive controller with application.	CO4	7 Marks

UNIT-V

9.	a)	Discuss the ethics to be followed in mechatronic design.	CO6	7 Marks
	b)	Discus the merits and demerits of the coin counter designed as per mechatrnics approach.	CO5	7 Marks
		(OR)		
10.		With the help of ladder diagram, explain the automatic car barrier system.	CO5	14 Marks

CODE No.: 16BT51203 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

WEB TECHNOLOGIES

[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Create a simple HTML page which demonstrates the use of various types of lists. Try adding a definition list which uses an unordered list to define term.	CO1, CO2	7 Marks
	b)	Create a HTML document that has your image and your friend's image with a specific height and width. Also when clicked on the images it should be navigate to their respective profiles.	CO1, CO2	7 Marks
		(OR)		
2.	a)	Explain the frames and table tags of HTML with suitable example.	CO2	7 Marks
	b)	Explain the following HTML tags with suitable example. i) <font>. ii) <meta>. iii) <p>. iv) <video>.	CO2	7 Marks

UNIT-II

3.	a)	Describe the different ways that CSS styles can be added to a page.	CO3	6 Marks
	b)	Explain the following terms related to CSS with examples. i) Font-size. ii) Font-weight. iii) Text-decoration. iv) Text-transform. v) Padding. vi) Border style.	CO3	8 Marks
		(OR)		
4.	a)	Explain the following built–in objects of java Script. i) Window. ii) Document.	CO3	8 Marks
	b)	Write a JavaScript which validates registration form.	CO4	6 Marks

UNIT-III

5.	a)	Demonstrate in detail about JQuery selectors and events.	CO5	7 Marks
	b)	How to access HTML elements and attributes using JQuery.	CO5	7 Marks
		(OR)		
6.		Develop packaged components in bootstrap.	CO5	14 Marks

UNIT-IV

7.	a)	What is regular expression? Explain its functions in PHP.	CO5	7 Marks
	b)	Explain the various operators and control structures in PHP with examples.	CO5	7 Marks
		(OR)		
8.	a)	Develop a PHP code to implement multi-level inheritance.	CO5	8 Marks
	b)	Demonstrate OOP principals with suitable example using PHP.	CO5	6 Marks

UNIT-V

9.		Demonstrate how to handle cookies and sessions in PHP.	CO5	14 Marks
		(OR)		
10.	a)	List the different authentication methodologies used in PHP.	CO6	7 Marks
	b)	Design a web page to store the contact us form data in the database using PHP. (Note: contact us page contains the following fields name, email-id, subject, message and submit button).	CO6	7 Marks

CODE No.: 16BT51241 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

OBJECT ORIENTED PROGRAMING
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Discuss fundamental principles of OOPs with respect to java language.	CO1	8 Marks
	b)	Is Java Strongly Typed Language? Discuss.	CO1	6 Marks
		(OR)		
2.	a)	Demonstrate various iterative statements in java with suitable examples.	CO1, CO2	8 Marks
	b)	With the help of an example, explain constructor overloading in java.	CO1	6 Marks
		UNIT-II		
3.	a)	Explain Creating Packages and Accessing a Package with examples.	CO2	7 Marks
	b)	What is inheritance? How inheritance is implemented in java? And discuss the advantages of inheritance.	CO1, CO3	7 Marks
		(OR)		
4.	a)	Define an interface. With an example, discuss how interfaces are implemented and accessed in java.	CO2	8 Marks
	b)	Explain the usage of super keyword with suitable example.	CO2	6 Marks
		UNIT-III		
5.	a)	What do understand by Synchronization? Discuss with an example.	CO2	8 Marks
	b)	Illustrate the creation of user defined exception with an example.	CO2	6 Marks
		(OR)		
6.	a)	Explain inter thread communication with suitable example.	CO2	8 Marks
	b)	Explain thread life cycle methods.	CO1, CO3	6 Marks
		UNIT-IV		
7.		What is the need of layout managers? Explain different types of layout managers available in AWT.	CO4	14 Marks
		(OR)		
8.	a)	Define an applet. Discuss applet life cycle methods with an example.	CO4	7 Marks
	b)	Write a java program to create single linked list with ten student names using LinkedList collection java class.	CO6	7 Marks
		UNIT-V		
9.	a)	Explain various interfaces and classes available in javax.servlet Package	CO5	8 Marks
	b)	Write a java program using listeners for handling mouse events.	CO5	6 Marks
		(OR)		
10.	a)	What is the role of event listeners in event handling? List the Java event listeners with suitable example.	CO5	8 Marks
	b)	Discuss about any four Event Classes.	CO5	6 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

FOUNDATION ENGINEERING

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain in brief about various stages in soil exploration.	CO1	8 Marks
	b)	Standard penetrate test was conducted in a deposit of fully submerged fine sand and field N value was reported as 56 at a depth of 4.5m. The average saturated unit weight of the soil is 21kN/m^3. Calculate the corrected N value.	CO2	6 Marks

(OR)

2.	a)	Discuss about following samplers. i) Split spoon sampler. ii) Rotary sampler.	CO1	7 Marks
	b)	Explain in brief about limitations of plate load test.	CO1	7 Marks

UNIT-II

3.	a)	With an aid of neat sketch, explain how active earth pressure condition can be determined using Culmann's graphical method.	CO1	8 Marks
	b)	A retaining wall, 5m high supports a backfill (c = 20kN/m^2, Φ = 28^o, γ = 21kN/m^3) with horizontal surface. The backfill carries surcharge load of 25kN/m^2. If the wall pushed towards backfill, compute the total thrust acting on retaining wall.	CO2	6 Marks

(OR)

4.	a)	What are assumptions of Coulomb's earth pressure theory? Give out the analytical equation for determined the coefficient of active earth pressure using this theory.	CO1	6 Marks
	b)	A retaining wall with a smooth vertical back is 8m high and retains a 2-layer sand backfill each having a depth of 4 m. For top layer $\Phi' = 30^0$ and γ = 19kN/m^3 and for bottom layer $\Phi' = 32^0$ and γ = 20kN/m^3. Calculate the active thrust acting per meter run on the retaining wall. Show active earth pressure distribution.	CO2	8 Marks

UNIT-III

5.	a)	Derive an equation for find out the stability of infinite slopes in cohesion-less soil for steady seepage condition.	CO2	6 Marks
	b)	A 7m deep canal has side slope of 1:1. The soil has C_u = 20kN/m^2, $\Phi_u = 10^0$, e = 0.8 and G = 2.67. Determine the factor of safety with respect to cohesion, when canal runs fully. Also, find the same in case of sudden drawdown condition. For $\Phi_u = 10^0$, slope 1:1, take S_n=0.11 For $\Phi_u = 4.81^0$, slope 1:1, take S_n=0.135.	CO2	8 Marks

(OR)

6.	a)	Explain about Swedish Circle method for slope stability analysis of finite slopes.	CO2	8 Marks
	b)	An embankment of height 10m and slope with an inclination of 40^0 was made with soil having c' = 25kN/m^2, $\Phi = 28^0$, γ = 18kN/m^3. Determine the critical height of the infinite slope for fully submerged condition and write a comment on stability of embankment.	CO2	6 Marks

UNIT-IV

7.	a)	Mention the Terzaghi's bearing capacity equation. What are the major assumptions made in the Terzaghi's bearing capacity theory?	CO2	7 Marks
	b)	For a square footing that is B x B in plan, the following are given: D_f = 1m; vertical gross allowable load Q_{all} = 665kN; γ = 18kN/m^3; Φ' = 40^0 ; C' = 0; and factor of safety = 3; determine the size of the footing.	CO2	7 Marks

(OR)

8.	a)	Give out equations for determining allowable bearing pressure from following methods. i) Teng's Method. ii) Peck Method. iii) As per IS 6403-1971. iv) Bowle's method.	CO1	8 Marks
	b)	A circular footing of size 2.5m rests on soil having c= 20kN/m^2, Φ = 25^0 and γ = 17.5kN/m^3. The depth of the foundation is 1m. Determine the gross allowable load on foundation with a factor of safety of 3. Assume general shear failure. (For Φ = 25^0, N_c= 25.1, N_q= 12.72 and N_γ = 8.34)	CO2	6 Marks

UNIT-V

9.	a)	Classify the types of pile foundation based on: i) Material used. ii) Method of installation. iii) Mode of load transfer. iv) Displacement.	CO1	8 Marks
	b)	A group of 16 bored pile are installed in clayey soil having unconfined compression strength, q_u = 60kN/m^2. The piles are 8m long and 30cm diameter with c/c spacing of 90cm. Estimate the safe load of pile group. Take F.S = 3 and α = 0.7.	CO2	6 Marks

(OR)

10.	a)	Discuss in detail about various components of well foundations.	CO1	8 Marks
	b)	Explain about pneumatic caisson with the help of neat sketch.	CO1	6 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

HIGHWAY AND TRAFFIC ENGINEERING

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	With neat sketches, explain different road patterns.	CO1	7 Marks
	b)	What are the objectives of 3rd road development plan? How do you determine road lengths by 3rd road development plan formulae?	CO1	7 Marks
		(OR)		
2.	a)	Design the rate of super elevation for a horizontal highway curve of radius 500m and speed 80 kmph on a plain terrain.	CO3	7 Marks
	b)	What are the various types gradients used in highways? Explain briefly.	CO3	7 Marks

UNIT-II

3.	a)	Explain briefly about the material and equipment requirements for organizing different tests on coarse aggregates as per IRC standards.	CO2	7 Marks
	b)	How do you determine the CBR of Soil in the laboratory?	CO2	7 Marks
		(OR)		
4.	a)	Determine the warping stress at interior edge and corner of a 25cm thick cement concrete pavement with transverse points at 5m interval and longitudinal joints at 3.6m intervals. The modules of sub grade reaction k is 6.9 kg/cm^3. Assume Max. Temperature differential during day to be 0.6^{0}C per cm slab thickness (for warping stress at interior and edge) and max temp. Differential of 0.4^{0}C per slab thickness during night (for warping stress at the corner). Additional data given. ($e = 10 \times 10^{-6}$ per ^{0}C, $E = 3 \times 10^5$ kg/cm^2, $\mu = 0.15$, $Cx = 0.88$, $Cy = 0.54$)	CO2	7 Marks
	b)	What are the factors influencing the design of pavements?	CO2	7 Marks

UNIT-III

5.	a)	Explain skidding along with the factors determining skid resistance and road construction practices for obtaining skid resistant surfaces.	CO5	7 Marks
	b)	Explain the basic relationship between Volume, Speed and Density.	CO4	7 Marks
		(OR)		
6.	a)	Explain various road user characteristics that effect traffic performance.	CO4	7 Marks
	b)	Discuss fundamental diagrams of traffic flow.	CO6	7 Marks

UNIT-IV

7.	a)	Enlist methods of travel time and delay study. Describe moving observer method.	CO6	7 Marks
	b)	Mention the methods available for origin and destination survey. Explain in detail home questionnaire survey.	CO8	7 Marks
		(OR)		

8. a) Explain the various factors that affect the level of service. Explain the different types of level of service. CO7 7 Marks

b) A test car was used on a north-south road 0.75 km long and the following data given below was collected for the moving car was collected. Calculate traffic volume, average travel time and space mean speeds in both directions. CO6 7 Marks

North trip no.	Travel Time (along) in min	No. of vehicles met Against	No of vehicles overtaking test car	No of vehicles overtaken by test car
1	2.65	85	1	0
2	2.70	83	3	2
3	2.35	77	0	2
4	3.00	85	2	0
5	2.42	90	1	1

North trip no.	Travel Time (along) in min	No. of vehicles met Against	No of vehicles overtaking test car	No of vehicles overtaken by test car
1	2.33	110	2	0
2	2.71	115	0	2
3	2.48	120	0	0
4	2.54	125	1	1
5	2.16	105	0	2

UNIT-V

9. a) Discuss various advantages and disadvantages of traffic signals in detail. CO6 7 Marks

b) Explain the various types of off street parking systems in detail. CO7 7 Marks

(OR)

10. a) Write a detailed note on various driver factors that cause accidents and mention the concerned preventive measures. CO7 7 Marks

b) Draw a neat sketch of rotary intersection, show all design components and explain about them in brief. CO7 7 Marks

CODE No.: 16BT60103 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

STEEL STRUCTURES
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	A tie member consisting of an ISA 80mm x 50mm x 8mm is welded to a 12mm thick gusset plate at site. Design welds to transmit load equal to the design strength of the member. Assume Fe 410 grade steel.	CO2	14 Marks
	(OR)		
2.	Design a single bolted double cover butt joint to connect boiler plates of thickness 12mm for maximum efficiency. Use M16 bolts of grade 4.6. Boiler plates are of Fe 410 grade. Find the efficiency of the joint.	CO3	14 Marks

UNIT-II

3.	Design a laterally supported beam of effective span 6 m for the following data: Grade of steel: Fe 410; Maximum bending moment: 160 kNm; Maximum shear force: 220 kN. Check for deflection is not required.	CO3	14 Marks
	(OR)		
4.	A steel floor beam in a building has a span of 6m. It is simply supported over supports and carries a uniform load of 40kN/m, inclusive of self weight. Design the beam (Fe 410) if, i) the compression flange is restrained throughout the span against lateral bending. ii) the lateral supports for the compression flange are provided only at the ends.	CO2	14 Marks

UNIT-III

5.	Select a suitable angle section to carry a factored tensile force of 180 kN assuming a single row of M20 bolts and assuming design strength as fy = 250 MPa.	CO5	14 Marks
	(OR)		
6.	A double angle discontinuous strut 2.25m long consists of two ISA 60 x 60 x 5 connected to the same side of the 8mm thick gusset plate by one bolt. Calculate the load that this strut can carry.	CO7	14 Marks

UNIT-IV

7.	Design a laced column 10m long to carry a factored axial load of 1100kN. The column is restrained in position but not in direction at both ends. Provide single lacing system with bolted connection. Design the column with two channels back to back.	CO3	14 Marks
	(OR)		
8.	A column ISHB 350 at 661.2 N/m carries an axial compressive factored load of 1600kN. Design a suitable welded gusset base. The base rests on M-15 grade of concrete.	CO3	14 Marks

UNIT-V

9. By using IS Codes, determine the design loads on the purlins of an industrial building near Visakhapatnam: CO7 14 Marks

Given data:

Class of building:	General with life of 50 years.
Terrain:	Category 2.
Maximum dimension:	40 m.
Width of building:	15 m.
Height at eve level:	8 m.
Topography:	θ less than 3^0.
Permeability:	Medium
Span of truss:	15 m.
Pitch:	1/5.
Sheeting of purlins:	1.35 m.
Spacing of trusses:	4 m.

(OR)

10. Explain the following with neat sketches: CO1 14 Marks

i) Bracing system in roof trusses.
ii) Anchorages of truss with concrete column.
iii) Connection of purlin to rafter.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

GROUNDWATER DEVELOPMENT AND MANAGEMENT

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain vertical distribution of groundwater with a neat sketch.	CO1	7 Marks
	b)	Discuss various geological formations of aquifers with suitable examples.	CO1	7 Marks
		(OR)		
2.		Describe Groundwater flow contours and their applications with respect to flownet analysis.	CO2	14 Marks

UNIT-II

3.	a)	Explain unconfined aquifer with a neat sketch.	CO2	6 Marks
	b)	In an artesian aquifer, the drawdown is 1.2 meters at a radial distance of 10 meters from a well after two hours of pumping. On the basis of Thies, non-equilibrium equations, determine the pumping time for the same drawdown at a radial distance of 30 meters from the well.	CO2	8 Marks
		(OR)		
4.	a)	Derive an expression to determine the discharge through unconfined aquifer using Dupit's equation.	CO3	7 Marks
	b)	A well is located in a 30m thick confined aquifer of permeability 35m per day and storage coefficient of 0.004. If the well is pumped at a rate of 1500 litres per minute, calculate the drawdown at a distance of 40m from the well after 20 hours of pumping.	CO3	7 Marks

UNIT-III

5.		Describe the shape of fresh salt water interface.	CO6	14 Marks
		(OR)		
6.		Explain the structure of the fresh salt water interface.	CO6	14 Marks

UNIT-IV

7.	a)	Explain the advantages and disadvantages artificial recharge of groundwater.	CO5	7 Marks
	b)	List artificial recharge methods and explain stream channel method with a neat sketch.	CO5	7 Marks
		(OR)		
8.		Describe the application of Remote Sensing in artificial recharge of groundwater along with a case study.	CO4	14 Marks

UNIT-V

9.		List surface methods in groundwater exploration and explain seismic refraction method with a neat sketch.	CO4	14 Marks
		(OR)		
10.		List the types of information that can be obtained from various logging techniques.	CO7	14 Marks

CODE No.: 16BT60110 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

SOLID WASTE MANAGEMENT
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Describe the effects of improper disposal of solid waste on human health and environment.	CO6	7 Marks
	b)	Explain the factors influencing solid waste generation.	CO2	7 Marks
		(OR)		
2.		Write about the interrelationship of the functional elements in a solid waste management system.	CO4	14 Marks

UNIT-II

3.	a)	Compose the impacts of public health and economic aspects of on-site solid waste storage system.	CO6	7 Marks
	b)	Explain the factors that should be considered in evaluating onsite processing equipment.	CO1	7 Marks
		(OR)		
4.		Describe on-site segregation and handling of solid waste.	CO9	14 Marks

UNIT-III

5.		Discuss the methods adopted in India for collection and disposal of refuse. What changes would you recommend in these, so as to make the process more hygienic and aesthetic?	CO7	14 Marks
		(OR)		
6.	a)	Describe the operation of hauled container system of waste collection.	CO1	7 Marks
	b)	Assess the various methods of house to house solid waste collection and their advantage.	CO2	7 Marks

UNIT-IV

7.	a)	Describe the mechanical methods of volume reduction of solid waste.	CO2	7 Marks
	b)	Write short note on air pollution problems in incineration process and suggest which act should be followed for safety implementation of incineration process.	CO8	7 Marks
		(OR)		
8.		Explain composting process of bio-degradable municipal solid waste.	CO5	14 Marks

UNIT-V

9.	a)	Write short note on environmental factors in sanitary landfill sites.	CO1	7 Marks
	b)	Explain different methods used for municipal solid waste on land.	CO1	7 Marks
		(OR)		
10.		What is leachate? Design various methods for treatment and disposal of lleachate.	CO3	14 Marks

CODE No.: 16BT60114 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

DISASTER MITIGATION AND MANAGEMENT

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define the term 'disaster' and describe its classification.	CO2	7 Marks
	b)	What are the pre-disaster measures to be taken to prevent loss of life due to this hazard?	CO1	7 Marks
		(OR)		
2.	a)	Define vulnerability and discuss the process of vulnerability analysis.	CO1	7 Marks
	b)	Write a short note on major initiatives for disaster preparedness in India.	CO5	7 Marks

UNIT-II

3.	a)	What are the guidelines for preparation of disaster management plans?	CO1	7 Marks
	b)	List a few of the prominent earthquakes which occurred in India in last two decades and what are the lessons leant from them.	CO6	7 Marks
		(OR)		
4.	a)	Explain the terms: i) Epicentre. ii) Hypocentre. iii) Fault plane.	CO1	7 Marks
	b)	Give a brief note on seismic activity in India.	CO1	7 Marks

UNIT-III

5.	a)	How do engineered structures help us to withstand cyclones?	CO3	7 Marks
	b)	Discuss in brief various flood control measures.	CO1	7 Marks
		(OR)		
6.	a)	Explain the classification of drought.	CO2	7 Marks
	b)	What are the consequences of drought? Explain briefly.	CO1	7 Marks

UNIT-IV

7.	a)	Write a short note on factors responsible for landslides.	CO2	7 Marks
	b)	What are the effects and consequences of landslides?	CO1	7 Marks
		(OR)		
8.		Briefly explain the structural and non-structural mitigation measures for landslides.	CO1	14 Marks

UNIT-V

9.	a)	Explain the phases of disaster management.	CO1	7 Marks
	b)	Discuss the importance of disaster preparedness with special reference to issues and problems in it.	CO4	7 Marks
		(OR)		
10.	a)	Make an overview of recent trends in disaster management.	CO5	7 Marks
	b)	What are the objectives of National Disaster Management Plan (NDMP)?	CO1	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

RURAL TECHNOLOGY

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Ramu wants to construct an own house by taking loan from the bank through government schemes. List the schemes that are associated with housing and explain them.	CO1	7 Marks
	b)	What are the safety issues that have to be taken while transferring any documents?	CO5	7 Marks
		(OR)		
2.	a)	List out and explain the different ways how you will eradicate poverty.	CO1	7 Marks
	b)	Examine the role of financial institutions in rural development with special emphasis on NABARD.	CO4	7 Marks

UNIT-II

3.		What is meant by non-conventional energy? Mudipatla is a village having problem with electricity. Explain how it helps to prevent power deficiency problems in rural areas.	CO1	14 Marks
		(OR)		
4.	a)	What do you understand by 3R principle? How this can be useful for the rural people for the waste management?	CO4	7 Marks
	b)	Explain in detail the production of biomass with the waste available in the village areas.	CO1	7 Marks

UNIT-III

5.	a)	Enumerate the technologies involved in food processing units in detail.	CO4	7 Marks
	b)	Elaborate the role of cottage industry in rural development.	CO1	7 Marks
		(OR)		
6.		What is plant tissue culture? How plant tissue culture is carried out in the laboratory?	CO2	14 Marks

UNIT-IV

7.	a)	Suggest the rural people to construct various rainwater harvesting structures to store and to increasing the groundwater levels.	CO4	7 Marks
	b)	What are the problems associated with poor water quality? Address the issues that are involved in environment and sanitation.	CO5	7 Marks
		(OR)		
8.		Educate the use of bio fertilizers to the rural people with the resources available in the rural area. What are the disadvantages of using chemical fertilizers?	CO6	14 Marks

UNIT-V

9.		Explain how ICT are helpful to the rural people. List some of the ICT applications which are used in rural areas.	CO1	14 Marks
		(OR)		
10.		Carryout feasibility study on the public and private partnership for rural development. Suggest the government in various ways how the village can be developed under adoption scheme.	CO3	14 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

POWER SEMICONDUCTOR DRIVES
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain about nature and classification of different load torques.	CO1	7 Marks
	b)	Explain the multi-quadrant operation of an electric motor with relevant characteristics when the motor is driving a hoist load.	CO2	7 Marks
		(OR)		
2.	a)	The electric motor drive develops a torque expressed by $T_M = a\omega+b$ where **a** and **b** are positive constants, the motor is supposed to drive the load torque which is given by $T_L = c\omega^2 + d$ where c and d are other positive constants, the total inertia of the rotating masses is J. Determine the relation among the among **a, b**, **c** and **d** in order to start the motor and load together and have an equilibrium operating speed and also calculate this equilibrium operating speed.	CO2	7 Marks
	b)	Develop a criterion for finding the steady state stability of an electric drive.	CO1	7 Marks

UNIT-II

3.	a)	Explain various relative operational merits and demerits of single phase fully controlled converters fed to DC motors.	CO2	4 Marks
	b)	Explain the operation of a separately excited dc motor supplied from 3-Φ semi controlled rectifier and draw voltage and current waveforms.	CO3	10 Marks
		(OR)		
4.	a)	Draw and explain the speed–torque characteristics of a DC separately excited motor fed by three phase semi converter with relevant equations.	CO2	6 Marks
	b)	Explain the operation of single phase dual converter controlling the separately excited DC motor.	CO5	8 Marks

UNIT-III

5.	a)	Describe the operation of DC separately excited motor fed by type-B chopper with relevant waveforms.	CO3	7 Marks
	b)	Briefly explain the chopper control performance fed with separately excited DC motor in regenerative braking control mode with neat diagrams.	CO2	7 Marks
		(OR)		
6.	a)	Draw the block diagram and explain the closed loop speed control of separately excited DC motor.	CO4	7 Marks
	b)	Explain with circuit and waveforms of four quadrant chopper fed separately excited DC motor.	CO2	7 Marks

UNIT-IV

7.	a)	Illustrate the stator frequency control of induction motor with torque and power limitations in real time applications.	CO5	7 Marks
	b)	Show that variable frequency control of induction motor is more efficient than stator voltage control.	CO1	7 Marks

(OR)

8.	a)	Explain closed loop operation of CSI fed induction motor drives with a neat diagram.	CO4	7 Marks
	b)	Explain static Scherbius drive control for speed control of induction motor. Draw speed -torque characteristics	CO2	7 Marks

UNIT-V

9.	a)	Describe the advantages of self-controlled variable speed synchronous motor drive over the separate controlled drive.	CO1	6 Marks
	b)	In variable frequency control of a synchronous motor why (V/f) ratio is maintained constant up to base speed and V constant above the base speed. Explain briefly with necessary waveforms.	CO6	8 Marks

(OR)

10.	a)	Explain the operation of self controlled synchronous motor fed by voltage source inverter with a neat diagram.	CO4	7 Marks
	b)	Briefly explain the various drive circuits for stepper motor.	CO5	7 Marks

CODE No.: 16BT60202 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

POWER SYSTEM ANALYSIS
[Electrical and Electronics Engineering]

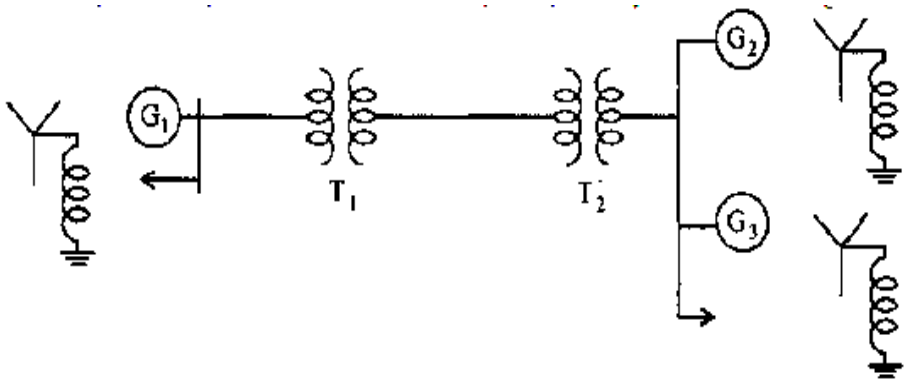
Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) List the advantages of the p.u form of representation. CO1 5 Marks

   b) Obtain the per unit representation for the three-phase power system shown in figure CO3 9 Marks



Generator 1 : 50 MVA; 10.5 KV; X = 1.8 ohm
Generator 2 : 25 MVA; 6.6 KV; X = 1.2 ohm
Generator 3 : 35 MVA; 6.6 KV; X = 0.6 ohm
Transformer T1 : 30 MVA; 11/66 KV; X = 15 ohm/phase
Transformer T2 : 25 MVA; 66/6.2 KV, as h.v. side X = 12 ohms
Transmission line: XL = 20 ohm/phase

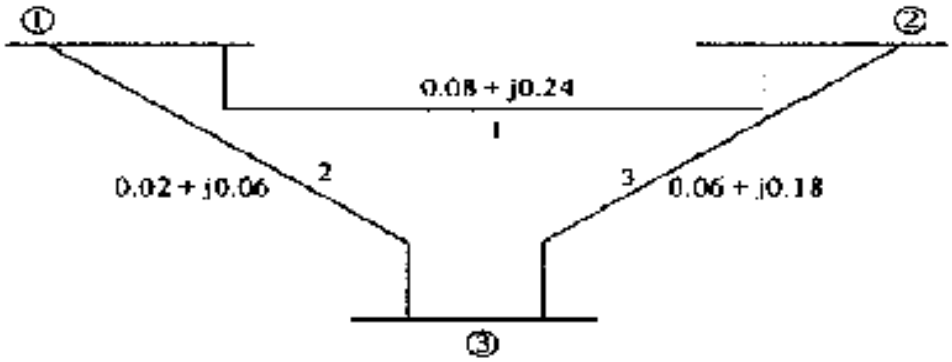
(OR)

2. a) Why are Per phase analysis done in a symmetrical three-phase system? CO2 7 Marks

   b) Discuss in detail about the modelling of transmission lines. CO2 7 Marks

UNIT-II

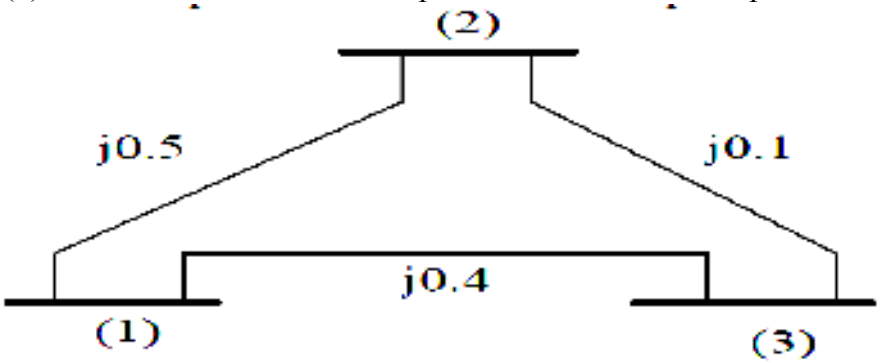
3. a) For the 3-bus system shown in the figure, Obtain Z_{BUS}. CO3 7 Marks



   b) Derive an expression for adding a branch element between two buses in the Z_{BUS} building algorithm. CO5 7 Marks

(OR)

4.	a)	For the system shown below, Obtain Y_{BUS} by direct inspection method. Take bus (1) as reference. The element impedances are indicated in p.u.	CO4	9 Marks



	b)	List the merits and demerits of Z_{BUS} building algorithm.	CO1	5 Marks

UNIT-III

5.	a)	Derive the generalized expressions for elements of Jacobian matrix for decoupled load method.	CO5	7 Marks
	b)	Compare Gauss-Seidel method and Newton-Raphson method of load flow studies	CO1	7 Marks

(OR)

6.		Explain clearly with detailed flowchart, the computational procedure for load flow solution using N-R method when the system contains all types of buses.	CO5	14 Marks

UNIT-IV

7.	a)	Illustrate the step by step procedure for systematic fault analysis using bus impedance matrix.	CO4	7 Marks
	b)	What do you understand by short-circuit KVA? Explain.	CO1	7 Marks

(OR)

8.	a)	The short circuit MVA at the bus bars for a power plant A is 1200 MVA and for another plant B is 1000 MVA at 33 KV. If these two are to be interconnected by a tie-line with reactance 1.2 ohm, determine the possible short circuit MVA at both the plants.	CO3	7 Marks
	b)	Derive the expression for fault current for a single line-to-ground fault in a power system faulted through fault impedance $\mathbf{Z_f}$.	CO3	7 Marks

UNIT-V

9.	a)	Derive the swing equation for a single machine connected to infinite bus system. State the assumptions if any and state the usefulness of this equation. Neglect the damping.	CO4	7 Marks
	b)	Describe the methods of improving transient stability.	CO1	7 Marks

(OR)

10.	a)	State the bad effects of instability. Distinguish between steady state and dynamic stability.	CO1	7 Marks
	b)	Explain critical clearing time and critical clearing angle, deriving the expressions.	CO4	7 Marks

❀ ❀ ❀

CODE No.: 16BT60203 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

DESIGN AND ESTIMATION OF ELECTRICAL SYSTEMS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

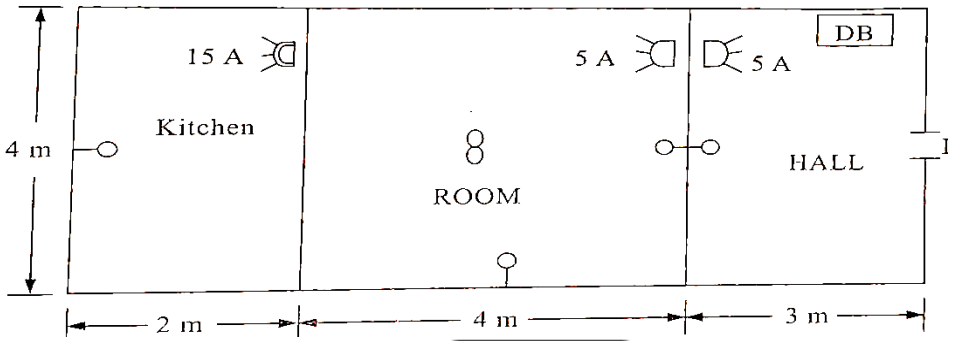
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain briefly CTS and TRS systems of wiring with neat sketches and mention advantages and disadvantages.	CO3	7 Marks
	b)	List out the general rules to be followed for internal wiring.	CO1	7 Marks

(OR)

2.		The plan of a residential building is shown in fig below. It is to be provided with CTS system of wiring. Estimate the material required and its cost. Wattage of Lamps = 60W, Fan = 80W, 5A socket = 100W, 15 A socket = 1000W. Also draw the wiring diagram. Assume any missing date.	CO2	14 Marks



UNIT-II

3.	a)	A 11kv line is to be erected to give supply to village 2km from existing 11kv line. Prepare a schedule of materials required for the line. Assume an average span of 50m and 2 cut points in line.	CO1	7 Marks
	b)	Calculate the number of various insulators needed for the erection of 500m, 3-phase, 11kv overhead line with two angled points and two turning points. The length of span is 70m.	CO3	7 Marks

(OR)

4.		An OH 11kv, 50Hz, 3-phase line is to be tapped off from the existing 11kv line pole at about 90^0 angle. The proposed line has to be erected on 10m long RCC poles with ACSR conductor of size 6/1 x 2.11mm with average span of 100m. Line has to pass through the city area spreading about 500m long. Furnish the list of materials required and estimate the cost for 3.2km ling line.	CO3. CO4	14 Marks

UNIT-III

5.	a)	Categorize the power circuits on the basis of applications and explain.	CO5	7 Marks
	b)	What are the advantages of Electric drives?	CO4	7 Marks

(OR)

6.	a)	Calculate the size of the conductor to be used for wiring of 15HP, 400V, 3-phase, 50Hz Induction motor. Consider the efficiency and power factor of motor as 0.85 and 0.8 respectively.	CO4	7 Marks
	b)	State some important points that guides in carrying out wiring for a motor installation.	CO1	7 Marks

UNIT-IV

7.	a)	What do you understand by polar curves?	CO1	7 Marks
	b)	Explain the principle of operation of sodiumvapor lamp with a neat diagram. Mention its uses.	CO5	7 Marks
		(OR)		
8.	a)	State and explain different lighting schemes.	CO5	7 Marks
	b)	State and explain laws of illumination.	CO1	7 Marks

UNIT-V

9.	a)	Describe the construction and operation of an electric arc furnace.	CO1	7 Marks
	b)	Describe the Ajax Wyatt type induction furnace and explain its working.	CO1	7 Marks
		(OR)		
10.	a)	Explain the principle of electric spot welding and seam welding.	CO5	7 Marks
	b)	What are the basic components of DC and AC welding sets and explain their working?	CO5	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

DIGITAL SIGNAL PROCESSING FOR ELECTRICAL ENGINEERS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) For each of the following systems, test whether or not the system is linear or nonlinear, causal or non-causal and stable or not. CO2 12 Marks

   i) $y(n) = x(n) + x^2(n-1)$. ii) $y(n) = x(2n)$.
   ii) $y(n) = ax(n) + bx(n-1)$. iv) $y(n) = |x(n)|$.

   b) List out the basic operations on discrete time signals. CO1 2 Marks

(OR)

2. a) Discuss sampling and quantization methods in A/D conversion process in detail. CO1 8 Marks

   b) Determine the solution of difference equation $y(n) = \frac{5}{6}y(n-1) - \frac{1}{6}y(n-2) + x(n)$ for the input $x(n) = 2^n u(n)$. CO1 6 Marks

UNIT-II

3. a) Find the DFT of sequence $x(n) = \{1, 2, 3, 4\}$ using Direct method. CO4 4 Marks

   b) Find the DFT of sequence $x(n) = \{1, 1, 1, 1, 1, 1, 1, 1\}$ using DIF-FFT algorithm. CO4 10 Marks

(OR)

4. What is the advantage of FFT? Discuss decimation in time and decimation in frequency algorithms in detail. CO1 14 Marks

UNIT-III

5. Design a digital IIR low pass filter with pass band edge of 1000Hz and stop band edge at 1500Hz for a sampling frequency of 5000Hz. The filter is to have a pass band ripple of 0.5dB and a stop band ripple below 30dB. Design a Butterworth filter using the bilinear transformation. CO3 14 Marks

(OR)

6. a) What is warping effect? What is its effect on magnitude and phase response? CO1 6 Marks

   b) Convert the given analog filter with system function $H(s) = \frac{1}{(s+3)(s+4)}$ into a digital filter using impulse invariant method assuming T=1s. CO3 8 Marks

UNIT-IV

7. a) Discuss the Fourier series method of designing FIR filters in detail. CO2 8 Marks

   b) What are the advantages and disadvantages of FIR filters? CO1 6 Marks

(OR)

8. Design an ideal lowpass filter with a frequency response CO3 14 Marks

   $H_d(e^{jw}) = 1$ for $-\frac{\pi}{2} \le \omega \le \frac{\pi}{2} = 0$ for $\frac{\pi}{2} \le |\omega| \le \pi$

   Find the values of $h(n)$ for N=11.
   Find H(Z) using Fourier series method.

UNIT-V

9.	Implement the process of controlling stepper motor using TMSLF2407 DSP controller in robotics.	CO5	14 Marks
	(OR)		
10.	Develop an algorithm by interfacing TMSLF2407 processor with stepper motor drive system for controlling its speed.	CO6	14 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

ELECTRICAL MACHINE DESIGN

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain various factors affecting the choice of the specific magnetic loading on a machine while designing.	CO1	7 Marks
	b)	A 350kW, 500V, 450 RPM, 6 pole DC generator is built with an armature diameter of 0.87m and a core length of 0.32m. The lap wound armature has 660 conductors. Calculate the specific magnetic and electric loadings.	CO2	7 Marks
		(OR)		
2.	a)	List the classes of electrical conducting materials and describe their properties and applications of those materials.	CO1	7 Marks
	b)	Classify the insulating materials used in electrical machines according to their thermal stability. Comment on selection of class of insulating material.	CO1	7 Marks

UNIT-II

3.	a)	Select and explain suitable procedure for designing the series field of DC machine.	CO3	8 Marks
	b)	Derive formula for air gap length of DC machine.	CO2	6 Marks
		(OR)		
4.	a)	List the guiding factors for selecting the armature slots.	CO1	6 Marks
	b)	Calculate the mmf required for air gap of a DC machine with an axial length of 20cm (no ducts) and a pole arc of 18cm. The slot pitch = 27mm, slot opening = 12mm, air gap = 6mm and the useful flux per pole = 25mWb. Take Carter's coefficient for slot as 0.3.	CO4	8 Marks

UNIT-III

5.	a)	Give the relationship between emf per turn and kVA rating of a transformer.	CO1	6 Marks
	b)	The tank of 1250 kVA, natural oil cooled transformer has the dimensions length, width and height as 0.65 x 1.55 x 1.85 m respectively. The full load loss = 13.1 kW, loss dissipation due to radiations = 6 $W/m^2\ ^0C$, loss dissipation due to convection=6.5 $W/m^2\ ^0C$, improvement in convection due to provision of tubes = 40%, temperature rise = 40^0C, length of each tube=1m, diameter of tube = 50mm. Find the number of tubes for this transformer. Neglect the top and bottom surface of the tank as regards the cooling.	CO4	8 Marks
		(OR)		
6.	a)	Derive the output equation of single phase transformer.	CO2	7 Marks
	b)	A 3-Phase, 50Hz, oil cooled core type transformer has the following dimensions: Distance between core centres = 0.2m, Height of window = 0.24m, Diameter of circumscribing circle = 0.14m, The flux density in the core = $1.25 Wb/m^2$, The current density in the conductor = $2.5 A/mm^2$. Assume a window space factor of 0.2 and the core area factor = 0.56. The core is two stepped. Estimate kVA rating of the transformer.	CO4	7 Marks

UNIT-IV

7.	a)	State and discuss the factors to be considered while determining the air gap in case of 3-phase induction motors.	CO1	7 Marks
	b)	Determine the approximate diameter and length of stator core for a 10kW, 415V, 3-phase, 4 pole, 1425 RPM, delta connected induction motor. Bav = 0.45Wb/m^2, ac = 2300 amp. cond./m, full load efficiency = 0.85, Power factor = 0.88. Assume (L/τ) value is unity.	CO4	7 Marks

(OR)

8.		Estimate the stator core dimensions number if stator slots and number of stator conductors per slot for a 100kW, 3300V, 50Hz, 12 pole, star connected slip ring induction motor. Bav = 0.4Wb/m^2, ac = 25000 amp.cond./m. the efficiency of machine is 90% and operating at 0.9 power factor. Compute main dimensions to give best power factor. The slot loading should not exceed 500 amp. conductors.	CO4	14 Marks

UNIT-V

9.	a)	Discuss pole design procedure for salient pole synchronous generators.	CO5	7 Marks
	b)	Determine core diameter and core length of 250kVA, 2200V, 12 pole, 500 RPM, 3-phase alternator by assuming average gap density as 0.6 Wb/m^2 and specific electric loading of 30000 amp. cond./m. take (L/τ) value as 1.5.	CO4	7 Marks

(OR)

10.	a)	Formulate the output equation of a synchronous machine.	CO2	7 Marks
	b)	Explain the step by step procedure for the design of field winding of synchronous machine.	CO5	7 Marks

CODE No.: 16BT60210 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

SPECIAL ELECTRICAL MACHINES
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the constructional details and working of a 3-phase variable reluctance stepper motor with 4/2 poles.	CO1	9 Marks
	b)	Enlist the applications of different types of stepper motor.	CO1	5 Marks

(OR)

2.	a)	What is bifilar winding? How it is used in a variable reluctance stepper motor?	CO1	4 Marks
	b)	Show the rotor positions of a 4-phase VR stepper motor with 6 rotor teeth when it rotates in a counter clockwise direction. Assume two-phase ON mode of excitation of phase windings.	CO2	10 Marks

UNIT-II

3.	a)	What is the need for sensing the rotor position of a SRM? Discuss in detail how an optical position sensor works.	CO1	7 Marks
	b)	Sketch the variation of inductance with rotor position of a three phase switched reluctance motor by ignoring fringing and saturation effects.	CO2	7 Marks

(OR)

4.	a)	Show that the torque developed in a switched reluctance motor is independent of the direction of the current.	CO1	7 Marks
	b)	Differentiate VR stepper motor from a switched reluctance motor.	CO4	7 Marks

UNIT-III

5.	a)	Show that a synchronous reluctance motor, develops maximum torque at a load angle of 45^0.	CO2	7 Marks
	b)	A 3-phase, 4 pole, 60Hz, 230V star connected synchronous reluctance motor has direct axis and quadrature axis synchronous reactances of 22.5Ω and 3.5Ω respectively. The load toque is 12.5 N-m. The Voltage to frequency ratio is maintained constant at rated value. Find: i) load angle. ii) line current. iii) power factor. Neglect rotational losses and armature resistance.	CO4	7 Marks

(OR)

6.	a)	Sketch the rotor structure of a line start synchronous reluctance motor and explain why these type of motors are self starting.	CO1	10 Marks
	b)	Discuss how SyRM are effectively employed in industrial applications.	CO6	4 Marks

UNIT-IV

7.	a)	A permanent magnet DC motor has an armature resistance of 1.03Ω. It draws a current of 1.25A at no load with 50V supply and running at 2100 r.p.m. Find: i) speed-voltage constant. ii) rotational losses. iii) constant power when it runs at 1700 r.p.m at 48V supply.	CO4	7 Marks
	b)	Sketch the drive circuit for a three phase BLDC motor and explain how rotation is achieved in clockwise and anticlockwise directions.	CO2	7 Marks

(OR)

8.	a)	What are the disadvantages of sensor based control of BLDC motor? Explain how sensor-less control will overcome these disadvantages with the help of a block diagram.	CO1	7 Marks
	b)	Explain in detail sensing and switching logic schemes of PMBLDC motor.	CO1	7 Marks

UNIT-V

9.	a)	Explain how a linear induction motor is developed from a cylindrical rotor induction motor. Why the stator and rotor of equal lengths cannot move continuously? What modifications can be made to achieve propulsion force continuously?	CO1	7 Marks
	b)	Discuss how a double sided Linear induction motor is used in electric traction with the help of a neat schematic diagram.	CO6	7 Marks

(OR)

10.	a)	Analyze the magnetic fields and forces within the air gap of a short-primary long-secondary Double Sided Linear Induction Motor (DSLIM).	CO2	7 Marks
	b)	Derive the expression for the thrust of linear force developed in a linear induction motor.	CO1	7 Marks

CODE No.: 16BT60301 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

CAD / CAM
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Identify why graphic standards are required? Explain IGES STEP and DXF.	CO1	7 Marks
	b)	List benefits and the applications of CAD.	CO1	7 Marks
		(OR)		
2.	a)	How does a work station differ from a PC? Give the hardware structure of a CAD work station.	CO1	6 Marks
	b)	Classify different types of input devices used in CAD environment and discuss each one of them with a neat sketch.	CO1	8 Marks

UNIT-II

3.	a)	Prove that two successive reflections about any two coordinate axis is equal to single rotation about origin.	CO1, CO3	6 Marks
	b)	Derive and write the general 2-D transformation matrices for Rotation, Reflection and Scaling transformations.	CO1, CO3	8 Marks
		(OR)		
4.	a)	Describe various commonly used primitives for solid modeling.	CO3	8 Marks
	b)	Explain through neat sketches the effect of standard Boolean Operations on any two basic solid primitives.	CO3	6 Marks

UNIT-III

5.	a)	What is computer aided part programming? Discuss its need.	CO1	6 Marks
	b)	What is dwell? Explain its function and how it is specified in part program.	CO4	4 Marks
	c)	How is the tool length compensation specified in a machining center?	CO4	4 Marks
		(OR)		
6.	a)	Classify the basic elements of CNC system.	CO1	8 Marks
	b)	Explain with neat sketch the operation of the canned cycle G81 as per ISO.	CO4	6 Marks

UNIT-IV

7.	a)	What is the basis for forming groups in group technology?	CO5	8 Marks
	b)	Explain the concept of composite part with an example.	CO5	6 Marks
		(OR)		
8.	a)	What methods are available for taking decisions in the process of developing a process plan?	CO1	7 Marks
	b)	What is a pocket with respect to process planning? Explain a simple method that can be used for pocket identification.	CO1	7 Marks

UNIT-V

9.	a)	Describe in detail about the benefits of CIM.	CO6	6 Marks
	b)	Explain the concept Rapid prototyping procedure with a neat schematic diagram.	CO6	8 Marks

(OR)

10.	a)	Write in detail about the computer aided testing of parts produced by CIM process.	CO6	7 Marks
	b)	Distinguish between Contact and Non-contact Inspection methods.	CO6	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

HEAT TRANSFER
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What are the mechanisms of heat transfer? How are they distinguished from each other?	CO1	7 Marks
	b)	Super heated steam at an average temperature of 200^0C is transported through a steel pipe (K = 50 w/m. K, D_0 = 8 cm, D_i = 6cm and L = 20m). The pipe is insulated with a 4-cm thick layer of gypsum plaster (K=0.5W/m.K). The insulated pipe is placed horizontally inside a warehouse where the average air temperature is 10^0C. The steam and air heat transfer coefficients are estimated to be 800 and 200W/m^2K respectively. Calculate: i) the daily rate of heat transfer from the superheated steam. ii) the temperature on the outside surface of the gypsum plaster insulation.	CO2, CO5	7 Marks

(OR)

2.	a)	Derive general three dimensional conduction equation for Rectangular co-ordinate system and deduce from it equation applicable 1-Dimensional steady state heat transfer with heat generation.	CO1	7 Marks
	b)	Calculate the rate of heat flow per m^2 through a furnace wall consisting of 200 mm thick inner layer of chrome brick, a centre layer of Kaolin brick 100 mm thick and an outer layer of masonry brick 100 mm thick. The heat transfer coefficient at the inner surface is 74 W/m^2 ^{0}C and the outer surface temperature is 70^0C. The temperature of the gases inside the furnace is 1670^0C. What temperatures prevail at the inner and outer surface of the centre layer? Take: $K_{chromebrick}$ = 1.25 W/m^0C, $K_{Kaolinbrick}$ = 0.074 W/m^0C $K_{masonrybrick}$ = 0.555 W/m^0C Assume steady heat flow.	CO2, CO5	7 Marks

UNIT-II

3.	a)	Derive an expression for temperature distribution and for heat transfer rate in the case of short fin with end insulated case.	CO2	7 Marks
	b)	Consider a very long rectangular fin attached to a flat surface such that the temperature at the end of the fin is essentially that of the surrounding air, i.e 20^0C. Its width is 5cm; thickness is 1mm, thermal conductivity is 200W/m.K and base temperature is 40^0C. The heat transfer coefficient is 20W/m^2K. Estimate the fin temperature at a distance of 5cm from the base and the rate of heat loss from the entire fin.	CO5, CO4	7 Marks

(OR)

4.	a)	What is meant by Lumped system analysis? Derive the expression for temperature distribution in a body with respect to time variation.	CO2, CO3	7 Marks
	b)	An aluminium sphere weighing 5.5 kg and initially at a temperature of 290^0C is suddenly immersed in a fluid at 15^0C. The convective heat transfer coefficient is 58W/m^2K. Estimate the time required to cool the aluminium sphere to 95^0C, using lumped capacity method of analysis. Also determine the temperature attained by the sphere after 30 min.	CO5	7 Marks

UNIT-III

5.	a)	Using dimensional analysis, obtain the general form of equation for natural convective heat transfer.	CO2	7 Marks
	b)	Air at 20^0C flows along a heated plate at 134^0C with a velocity of 3 m/s. The plate is 2m long and 1.5m wide. Calculate the thickness of the hydrodynamic boundary layer and the skin friction coefficient (Fanning Friction Factor) at 40cm from the leading edge of the plate. The Kinematic viscosity of air at 20^0C may be taken as 15.06 x 10^{-6} m^2/s. Also calculate the local heat transfer coefficient at a distance of 0.4 m from the leading edge and heat transfer from the first 40cm of the plate.	CO4	7 Marks

(OR)

6.	a)	Explain the mechanism of heat flow by natural convection and define Grashoff number and explain its significance in Natural convection heat transfer.	CO1	7 Marks
	b)	A 30cm long glass plate is hung vertically in the air at 2^0C while its temperature maintained at 77^0C. Calculate the boundary layer thickness at the trailing edge of the plate. If a similar plate is placed in a wind tunnel and air is blown over it at a velocity of 4m/s, estimate the boundary layer thickness at its trailing edge.	CO4	7 Marks

UNIT-IV

7.	a)	Derive an expression for LMTD of a counter flow heat exchanger.	CO2	7 Marks
	b)	Hot oil with a Heat capacity rate of 2500 W/K flows through a double pipe heat exchanger. It enters at 360^0C and leaves at 300^0C. Cold fluid enters at 30^0C and leaves at 26^0C. If the overall heat transfer coefficient is 800 W/m2K, determine the heat exchanger area required for: i) Parallel flow. ii) Counter flow.	CO4	7 Marks

(OR)

8.	a)	Explain various regimes in boiling heat transfer and distinguish between filmwise and and dropwise condensation.	CO1	7 Marks
	b)	A heated polished copper plate is immersed in a pool of water boiling at atmosphere pressure. If the surface temperature of copper plate is maintained at a temperature of 113^0C, determine the surface heat flux and the evaporation rate per unit area of the plate.	CO4	7 Marks

UNIT-V

9.	a)	What is Stefan-Boltzmann Law? Derive an expression for the same.	CO1	7 Marks
	b)	A black body having surface area 0.2m^2 has an effective temperature 800K. Determine the following. i) Total emission. ii) Intensity of radiation. iii) Wavelength for maximum spectral emissive power.	CO2, CO4	7 Marks

(OR)

10.	a)	Using the definition of radiosity and irradiation, deduce an expression for the radiation interchange between two grey bodies.	CO1	7 Marks
	b)	Two large parallel planes with emissivities 0.4 are maintained at different temperatures exchange heat only by radiation. What percentage change in net radiation heat transfer would occur, if two equally large radiation shields with surface emissivities 0.04 are introduced in parallel to the plates?	CO2, CO4	7 Marks

CODE No.: 16BT60303 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

NON-CONVENTIONAL ENERGY SOURCES
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Discuss the importance of Renewable energy over Conventional energy.	CO1	6 Marks
	b)	With the help of neat sketch, describe solar liquid heating system.	CO2	8 Marks
		(OR)		
2		Discuss in detail about the availability and growth of renewable and non renewable energy sources in India.	CO1	14 Marks

UNIT-II

3		Compare the performance of various types of solar collectors with neat sketches.	CO2	14 Marks
		(OR)		
4	a)	Outline the different heat losses in a solar collector with a suitable sketch.	CO2	8 Marks
	b)	What are the advantages and disadvantages of concentrating collectors over a flat - plate collectors?	CO2	6 Marks

UNIT-III

5	a)	Outline the principle of solar photovoltaic power generation. What are the main elements of a PV system?	CO3	8 Marks
	b)	Explain about Magneto-Hydro Dynamic (MHD) power generation with a neat sketch.	CO3	6 Marks
		(OR)		
6		Write a note on the following; i) Solar Ponds. ii) Solar Desalination. iii) I-V curves of a PV Cell. iv) Thermoelectric power.	CO3	14 Marks

UNIT-IV

7	a)	Brief about the factors to be considered in the development of wind power.	CO5	8 Marks
	b)	Discuss about anaerobic digestion. List out the factors that affect it.	CO5	6 Marks
		(OR)		
8	a)	Explain about the Vertical axis wind turbine with a neat sketch.	CO1	6 Marks
	b)	How are Gasifiers classified? Describe the pyrolysis process in detail.	CO2	8 Marks

UNIT-V

9	a)	What are the environmental impacts of geothermal energy?	CO3	6 Marks
	b)	Explain the operational features of liquid dominated geo-energy system with a neat sketch.	CO2	8 Marks
		(OR)		
10	a)	Explain the working principle of OTEC with suitable diagram.	CO2	7 Marks
	b)	What are the limitations and applications of OTEC plants?	CO5	7 Marks

CODE No.: 16BT60305 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

HYDRAULICS AND PNEUMATICS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	State Pascal's law and explain in details about the application of Pascal's law with neat sketch.	CO1	7 Marks
	b)	Explain the construction and working of a vane pump.	CO1	7 Marks
		(OR)		
2.	a)	Explain the basic hydraulic system and its Components with neat sketch.	CO1	4 Marks
	b)	Explain the construction and working of Diaphragm Accumulator.	CO2	10 Marks

UNIT-II

3.	a)	Explain the pressure control valve with graphical symbol.	CO1	4 Marks
	b)	Explain the working of shuttle valve with symbolic representation with a neat sketch.	CO2	10 Marks
		(OR)		
4.	a)	Draw the ANSI symbol for pressure relief valve and sequence valve.	CO1	4 Marks
	b)	Explain the construction and working of following. i) Meter-in circuit. ii) Meter-out circuit.	CO1	10 Marks

UNIT-III

5.		With a neat sketch of the Quick Exhaust and flow control valve and explain its construction and working.	CO1	14 Marks
		(OR)		
6.	a)	Discuss the working principle of an air compressor.	CO2	7 Marks
	b)	Explain with schematic sketch of FRL unit with ANSI symbol.	CO4	7 Marks

UNIT-IV

7.	a)	Explain the components present in a PLC and give their functions with block diagram.	CO3	7 Marks
	b)	What is cascade control? Explain giving suitable example circuit.	CO3	7 Marks
		(OR)		
8.		Discuss in detail the considerations taken while designing pneumatic circuits.	CO3	14 Marks

UNIT-V

9.		Explain the working principle of pilot assisted solenoid control of directional control valve with a neat sketch. Illustrate the graphical symbol of the valve.	CO6	14 Marks
		(OR)		
10.		Design the electro pneumatic circuit for the following sequence. A1B1 A0B0, where 1 is extension and 0 is retraction	CO5	14 Marks

CODE No.: 16BT60307 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

SUPPLY CHAIN MANAGEMENT
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What are the decision phases in SCM? Discuss in full.	CO1	7 Marks
	b)	In what way did the supply chain flows affect the success or failure of a firm? List any two supply chain decisions that have a significant impact on supply chain profitability.	CO2	7 Marks

(OR)

2.	a)	Explain the basic trade-off between responsiveness and efficiency for each of the major drivers of supply chain performance.	CO1	7 Marks
	b)	Discuss the major obstacles that must be overcome to manage a supply chain successfully.	CO1	7 Marks

UNIT-II

3.	a)	How do firms determine the optimum level of cycle stock in a chain? Discuss with a real world example.	CO4	7 Marks
	b)	What happened to the current inventory levels as we move backward, up the supply chain from retailer to manufacturer? Why?	CO1	7 Marks

(OR)

4.	a)	What is bullwhip effect and what are the main causes of bullwhip effect? What can a firm do to minimize demand distortions across the chain?	CO2	7 Marks
	b)	How could industrial supplies distributor use information to increase its responsiveness?	CO3	7 Marks

UNIT-III

5.	a)	Explain the main transportation strategies used by the firms. How to choose the optimum transportation strategy?	CO1	7 Marks
	b)	Discuss key drivers that may be used to tailor transportation. How does tailoring help?	CO2	7 Marks

(OR)

6.	a)	Explain why achieving strategic fit is critical to company's overall success.	CO2	7 Marks
	b)	How do firms build successful partnerships in supply chains?	CO2	7 Marks

UNIT-IV

7.	a)	What are the basic building blocks of an effective mass customization program? What kind of companywide cooperation is required for a successful mass customization program?	CO2	7 Marks
	b)	Explain the parameters to be considered in integrating supplies into new product development.	CO3	7 Marks

(OR)

8.	a)	What are the key challenges in adapting information technology to improve the efficiency of supply chain?	CO5	7 Marks
	b)	Why is IT the key component of SCM system? "Successful IT implementation is the outgrowth of the participation of knowledge workers". Comment with examples.	CO2	7 Marks

UNIT-V

9.	a)	What are the global issues in SCM? Discuss them by giving an account to cross border trade.	CO1	7 Marks
	b)	Elaborate on Supply Chain Management Metrics.	CO3	7 Marks

(OR)

10.	a)	Discuss about the global issues and outsourcing problems in SCM in the context of Indian industries perspective.	CO3	7 Marks
	b)	What do you understood by Mass Customization? Describe with advantages and limitations.	CO2	7 Marks

CODE No.: 16BT60401 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

ANTENNAS AND WAVEGUIDES
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Obtain the expression for characteristic impedance of a rectangular waveguide for TE mode of propagation.	CO1	9 Marks
	b)	A rectangular waveguide has a dimension of a = 22.86mm. Calculate the b dimension such that cut-off wavelength of TE_{11} mode is half that of TE_{10} mode.	CO1	5 Marks

(OR)

2.	a)	Derive the expressions for cut-off frequency, guide wavelength, phase velocity of TE mode in a rectangular waveguide and prove that $V_p V_g = V_c^2$.	CO5	7 Marks
	b)	A rectangular wave guide has dimensions 2.5cm x 5cm. Determine the guide wave length, phase constant (β) and phase velocity (V_P) at a wavelength of 4.5 cms for the dominant mode.	CO2	7 Marks

UNIT-II

3.	a)	Explain the current distribution on a thin-wire antenna.	CO3	7 Marks
	b)	For an infinitesimal dipole excited by a constant RF current I, determine radiation intensity U, maximum value of U and directivity.	CO5	7 Marks

(OR)

4.	a)	Explain the working principle of a single wire antenna.	CO3	7 Marks
	b)	Define effective height (h_{eff}) of an antenna? Discuss h_{eff} for half wave dipole and short dipole antenna.	CO5	7 Marks

UNIT-III

5.	a)	With a neat sketch, explain the operation of Yagi-Uda array.	CO3	7 Marks
	b)	Deduce an expression for the radiation pattern of an end-fire array with N vertical dipoles.	CO6	7 Marks

(OR)

6.	a)	Derive the array factor of N-element isotropic linear uniform distributed Antenna.	CO3	7 Marks
	b)	An array contains 10 isotropic radiators with an inter element spacing of 0.5λ. It is required to produce broadside and end-fire beams: i) Find Null-to-Null beam width and half-power beam width in degrees. ii) Find the directivity of both forms of arrays.	CO5	7 Marks

UNIT-IV

7.	a)	Design and explain the working principle of a Microstrip antenna.	CO4	7 Marks
	b)	Explain the working principle of a helical antenna in normal mode.	CO5	7 Marks

(OR)

8.	a)	Find the directivity of 10 turn helix antenna having pitch angle 10^0, circumference C equal to λ.	CO5	5 Marks
	b)	Explain the radiation mechanism of Microstrip antenna.	CO6	5 Marks
	c)	Describe the different types of Microstrip antennas.	CO3	4 Marks

UNIT-V

9.	a)	Write short notes on Field regions on antenna.	CO3	4 Marks
	b)	Define radiation intensity, directivity, and solid angle.	CO5	6 Marks
	c)	Calculate the directivity of an antenna, if HPBW on one plane is 30^0 and 60^0 on orthogonal plane.	CO2	4 Marks

(OR)

10.	a)	State the reciprocity theorem for antennas. Prove that the self-impedance of an antenna in transmitting and receiving mode is same.	CO6	7 Marks
	b)	Explain in detail the terms beam efficiency and directivity. Use relevant expression and diagrams.	CO5	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

DIGITAL SIGNAL PROCESSING
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define various elementary discrete time signals. Write notes on them and explain about their properties.	CO4	7 Marks
	b)	For the following discrete time signals, determine whether or not the system is linear, shift invariant, causal and stable. i) $y(n) = x(n + 7)$; ii) $y(n) = x^3(n)$.	CO4	7 Marks

(OR)

2.	a)	Find the DFT of the sequence $x(N) = \cos(n\pi/3)u(n)$.	CO4	7 Marks
	b)	Define stability of a system. Explain about BIBO stability criterion of a discrete system with an example.	CO4	7 Marks

UNIT-II

3.	a)	State and prove circular convolution property of DFT in frequency domain.	CO2	7 Marks
	b)	Find the DFT of the send quence $x(n)=\{1,2,3,4,4,3,2,1\}$ using DIT-FFT algorithm.	CO1	7 Marks

(OR)

4.	a)	Contrast the transforms DTFT,DFS and DFT.	CO1	7 Marks
	b)	Draw the radix 2 DIF-FFT structure when $N = 16$.	CO2	7 Marks

UNIT-III

5.	a)	Analog filter with transfer function $\boldsymbol{H_a(s) = s + 0.1/(s+ 0.1)^2 + 9}$. Convert into a digital IIR filter by using bilinear transformation.	CO5	7 Marks
	b)	Discuss about different methods of realization of IIR systems.	CO2	7 Marks

(OR)

6.	a)	Design a digital low pass Butterworth digital IIR filter which is required to meet the following specifications. Pass band attenuation ≤ 2dB. Pass band edge frequency = 4KHz stop band attenuation ≥ 40 dB stop band edge frequency = 8KHz. Sampling rate = 24 KHz by using bilinear transformation.	CO5	7 Marks
	b)	Derive an expression for order of the Butterwort analog proto type filter.	CO2	7 Marks

UNIT-IV

7.	a)	Explain designing of FIR filter using frequency sampling technique.	CO2	7 Marks
	b)	What is Gibbs phenomenon? How its effect can be reduced in the design of FIR filters.	CO1	7 Marks

(OR)

8.	a)	Derive an expression for frequency response of linear phase FIR filter when impulse response is symmetry having N odd number of samples.	CO3	7 Marks
	b)	Design a Linear phase low pass FIR filter with a cutoff frequency of π/2 rad/sec frequency sampling technique. Take N=11.	CO3	7 Marks

UNIT-V

9.	a)	Explain various types of general purpose registers in TMS 320C6X processor.	CO1	7 Marks
	b)	What is meant by bit reversal address mode? Write the applications for which addressing are proffered.	CO1	7 Marks
		(OR)		
10.	a)	Explain special addressing modes in programmable DSPs.	CO1	7 Marks
	b)	Explain the features of TMS 320C6X DSP processor.	CO1	7 Marks

CODE No.: 16BT60404 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

IMAGE PROCESSING
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain about fundamental steps in image processing with the help of a neat block diagram.	CO1	8 Marks
	b)	State and prove any three properties of 2-D Discrete Fourier Transform.	CO1	6 Marks
		(OR)		
2.	a)	Explain the following with an example: i) Neighbours of a pixel. ii) Adjacency. iii) Distance measures.	CO1	9 Marks
	b)	Explain the properties of slant transform.	CO3	5 Marks

UNIT-II

3.	a)	For the given 4 x 4 image having grey scale between [0, 9], get the histogram equalized image and draw the histogram of image before and after equalization. 2 3 3 2 4 2 4 3 2 2 3 5 2 4 2 4	CO4	7 Marks
	b)	Explain image sharpening using ideal high pass, butterworth and Gaussian high pass filters in frequency domain.	CO2	7 Marks
		(OR)		
4.	a)	Discuss about smoothing spatial filters.	CO2	7 Marks
	b)	With the help of a neat block diagram, explain the basic steps to perform image filtering in frequency domain.	CO2	7 Marks

UNIT-III

5.	a)	Draw and explain image degradation and restoration model.	CO3	6 Marks
	b)	Discuss how wiener filtering is useful to reduce mean square error.	CO5	8 Marks
		(OR)		
6.	a)	Explain different methods to estimate the degradation functions.	CO3	7 Marks
	b)	Discuss various order statistics filters for restoring the images in presence of noise.	CO1	7 Marks

UNIT-IV

7.	a)	Discuss about different types of redundancies in images.	CO1	6 Marks
	b)	Demonstrate arithmetic coding with an example.	CO4	8 Marks
		(OR)		
8.	a)	Define image compression and explain about run length coding.	CO5	8 Marks
	b)	Discuss about transform coding.	CO2	6 Marks

UNIT-V

9.	a)	Explain the detection of point, line and edge detection techniques.	CO1	7 Marks
	b)	Explain how the RGB color model converted into HSI color space.	CO6	7 Marks

(OR)

10.	a)	Explain adaptive thresholding.	CO5	7 Marks
	b)	Explain how gray level converted to color in pseudo color image processing.	CO6	7 Marks

CODE No.: 16BT60405 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

RADAR ENGINEERING

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Derive the simple form of radar range equation and explain how to calculate the range.	CO4	7 Marks
	b)	Analyze various system losses occurring in radar systems.	CO2	7 Marks
		(OR)		
2.	a)	Identify the need for integration of Radar Pulses. List their Types. Justify the best suited integration for practical applications.	CO6	7 Marks
	b)	Calculate the Doppler frequency of stationary CW radar transmitting at 8 MHz frequency when a moving target approaches the radar with a radial velocity of 100 Km/Hour.	CO4	7 Marks
		UNIT-II		
3.	a)	Illustrate the operation of an MTI radar system with a power amplifier in the transmitter.	CO1	7 Marks
	b)	Apply appropriate techniques to determine Range and Doppler measurements in radar systems.	CO5	7 Marks
		(OR)		
4.	a)	Sketch the block diagram of CW radar and explain the process of detection of radar signals.	CO1	7 Marks
	b)	Discuss the design constraints and band width requirements in a CW radar receiver.	CO3	7 Marks
		UNIT-III		
5.	a)	Illustrate conical scan tracking technique for tracking targets and its advantages.	CO5	7 Marks
	b)	Explain amplitude comparison monopulse tracking with neat diagrams.	CO1	7 Marks
		(OR)		
6.	a)	Illustrate the techniques to measure range of a target and discuss how the target is tracked continuously in radar systems giving some examples.	CO5	10 Marks
	b)	Identify the best search pattern for fire control tracking radar.	CO2	4 Marks
		UNIT-IV		
7.	a)	Design a Matched Filter receiver for optimum echo detection in the presence of noise.	CO3	7 Marks
	b)	Compare branch type and balance type of duplexer.	CO2	7 Marks
		(OR)		
8.	a)	Compare Range Height Indicator (RHI) and Plan Position Indicator (PPI) radar displays.	CO2	7 Marks
	b)	Demonstrate how beam width can be changed with steering angle in phased array antenna design.	CO3	7 Marks
		UNIT-V		
9.	a)	Explain in detail about LORAN navigation system.	CO1	7 Marks
	b)	Analyze and contrast between LORAN and DECCA navigation systems.	CO2	7 Marks
		(OR)		
10.	a)	Explain the salient features of VHF Omni Directional Range (VOR) navigation system.	CO4	7 Marks
	b)	Identify some real time applications of Navigational aids in the present	CO6	7 Marks

era and its advantages.

CODE No.: 16BT60406 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

TELECOMMUNICATION SWITCHING SYSTEMS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Classify switching systems. With simple circuit, explain the working of telephone network.	CO1	7 Marks
	b)	Why is it necessary to keep the magnetic diaphragm in an earphone displaced from its unstressed position? How is this achieved?	CO3	7 Marks
		(OR)		
2.	a)	Explain 3 x 3 and 6 x 6 crossbar switching with neat sketches.	CO1	7 Marks
	b)	What happens if the ratio φ/φ0 is not very small in case of an earphone?	CO3	7 Marks

UNIT-II

3.	a)	Infer the objectives of numbering plan. How are they classified?	CO6	7 Marks
	b)	Paraphrase the objectives of numbering plan with the help of example.	CO1	7 Marks
		(OR)		
4.	a)	Conclude the functions performed by subscriber line interface. Explain.	CO1	7 Marks
	b)	Analyze the objectives of charging plan. How are they classified?	CO6	7 Marks

UNIT-III

5.	a)	Originate channel associated and channel non associated mode of signalling techniques.	CO4	7 Marks
	b)	A group of 20 servers carry a traffic control of 10 erlangs. If the average duration of a call is three minutes, calculate the number of calls put through by a single server and the group as a whole in a one hour period.	CO3	7 Marks
		(OR)		
6.	a)	What is grade of service? Obtain grade of service for three stage and four stage networks.	CO4	7 Marks
	b)	On an average, one call arrives every 5 sec. During a period of 10 seconds, what is the probability that: i) No call arrives? ii) One call arrives? iii) Two call arrives? iv) More than two calls arrive?	CO3	7 Marks

UNIT-IV

7.	a)	What are the new services supported by ISDN? Explain any four of them in detail.	CO5	7 Marks
	b)	Compare NISDN and BISDN.	CO2	7 Marks
		(OR)		
8.	a)	Summarize the motivation of ISDN. Explain its services, network and protocol architecture used for different applications.	CO5	7 Marks
	b)	How functional modules are interconnected in BISDN and explain.	CO2	7 Marks

UNIT-V

9.	a)	What is CM and CMTS? Explain.	CO1	7 Marks
	b)	Compare ADSL, VDSL, HDSL and SDSL technologies.	CO4	7 Marks
		(OR)		
10.	a)	Write short notes on: i) CM and CMTS. ii) DOCSIS.	CO1	7 Marks
	b)	Explain in detail about ADSL with suitable block diagram.	CO4	7 Marks

❀ ❀ ❀

CODE No.: 16BT60407 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

DIGITAL CMOS IC DESIGN
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Explain the basic operation of 2-phase dynamic circuit.	CO1	7 Marks
	b)	Determine how to optimize multiple source drain connections in CMOS logic design.	CO4	7 Marks
		(OR)		
2.	a)	Define body effect. Explain the effect in a multiple input gate with example.	CO1	6 Marks
	b)	Write short notes for the following. i) C^2 MOS. ii) CVSL.	CO4	8 Marks
		UNIT-II		
3.	a)	Analyze how the digital CMOS circuits are designed and verified by using the tools.	CO2	9 Marks
	b)	Construct the layout diagram for CMOS inverter.	CO3	5 Marks
		(OR)		
4.	a)	What is Transmission gate? Draw the layout diagram for Transmission gate.	CO2	7 Marks
	b)	Construct the stick diagram for NMOS Inverter.	CO3	7 Marks
		UNIT-III		
5.	a)	Sketch and explain the schematic diagram of a SRAM memory cell along with sense amplifier and data write circuitry.	CO1	11 Marks
	b)	Criticize the difference between SRAM and DRAM techniques.	CO5	3 Marks
		(OR)		
6.	a)	Demonstrate the logic circuit of a basic RAM cell.	CO1	10 Marks
	b)	Compare random access and serial access Flash memory techniques.	CO5	4 Marks
		UNIT-IV		
7.	a)	Define Cross Talk and relate it to inter wire capacitance. Differentiate Floating Lines and Driven Lines.	CO6	7 Marks
	b)	Write short notes on latch based clocking.	CO1	4 Marks
	c)	Justify the concepts clock distribution techniques.	CO6	3 Marks
		(OR)		
8.	a)	Relate Ohmic voltage drop and resistance.	CO6	6 Marks
	b)	Discuss the process of Electromigration.	CO1	8 Marks
		UNIT-V		
9.	a)	Differentiate Logic design and Physical design.	CO2	7 Marks
	b)	Develop flow chart for Logic design flow and explain the significance of each block.	CO3	7 Marks
		(OR)		
10.	a)	Develop flow chart for FPGA design flow.	CO3	8 Marks
	b)	Appraise the parameters represented in data sheets.	CO2	6 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

LIGHT WAVE COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks

UNIT-I

1.	a)	Conclude the advantages of modified Chemical Vapor Deposition over Vapor Phase Deposition.	CO2	7 Marks
	b)	Design a silica optical fiber with a core diameter large enough to be considered by ray theory analysis having a core refractive index of 1.5 and a cladding refractive index of 1.47 for proper parametric values of numerical aperture, critical angle at core- cladding interface, acceptance angle in air for the fiber.	CO3	7 Marks
		(OR)		
2.	a)	Derive the numerical aperture of Step Index fiber (SI) from Snell's law.	CO2	7 Marks
	b)	With relevant diagrams, appraise the different types of optical fibers considering number of modes and material composition of core suited for practical applications.	CO3	7 Marks

UNIT-II

3.	a)	Discuss about nonlinear scattering losses in optical fiber.	CO1	7 Marks
	b)	A long single-mode optical fiber has an attenuation of 0.5dBkm^{-1} when operating at a wavelength of 1.3 μm. The fiber core diameter is 6 μm and the laser source bandwidth is 600MHz. Compare the threshold optical powers for stimulated Brillouin and Raman scattering within the fiber at the wavelength specified.	CO4	7 Marks
		(OR)		
4.	a)	Summarize the Signal Distortion in Single Mode Fibers.	CO1	7 Marks
	b)	Infer the contribution of various absorption mechanisms for losses in optical fibers.	CO4	7 Marks

UNIT-III

5.	a)	Conclude the effect of temperature on Avalanche Gain of a photo detector.	CO6	7 Marks
	b)	Differentiate simulated and spontaneous Emissions.	CO2	7 Marks
		(OR)		
6.	a)	Suggest improvements in Structures of InGaAs APDs to improve its performance.	CO6	7 Marks
	b)	Contrast PIN Diode and Avalanche Photo Diode.	CO2	7 Marks

UNIT-IV

7.	a)	A graded index fiber has a parabolic refractive index profile ($\alpha = 2$) and a core diameter of 50μm. Estimate the insertion loss due to a 3μm lateral misalignment at a fiber joint when there is index matching and assuming: i) there is uniform illumination of all guided modes only. ii) there is uniform illumination of all guided and leaky modes.	CO3	7 Marks
	b)	The end faces of two optical fibres with core refractive indices of 1.5 are perfectly aligned and have a small between them. This gap is filled with a gel having refractive index of 1.3. Find the optical losses in dB at this joint.	CO4	7 Marks
		(OR)		

8.	a)	Develop an expression to relate the power launched into a fiber and its brightness. Justify the effect of equilibrium numerical aperture in a long fiber length.	CO3	7 Marks
	b)	A silica multimode step index fiber has a core refractive index of 1.46. Determine the optical loss in decibels due to Fresnel reflection at a fiber joint with: i) a small air gap. ii) an index matching epoxy which has a refractive index of 1.40. It may be assumed that the fiber axes and end faces are perfectly aligned at the joint.	CO4	7 Marks

UNIT-V

9.	a)	Explain the significance of Link Power budget.	CO1	7 Marks
	b)	Define carrier-to-noise ratio. Identify the limiting conditions of the receiver.	CO5	7 Marks
		(OR)		
10.	a)	List and summarize various multi-channel transmission techniques.	CO1	7 Marks
	b)	Develop a model setup for an ARQ Error Control Scheme.	CO5	7 Marks

CODE No.: 16BT60501 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

SOFTWARE TESTING
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss the evolution of software Testing. Also explain the different levels of Testing.	CO1	6 Marks
	b)	Differentiate between Effective and Exhaustive software testing.	CO2	8 Marks
		(OR)		
2.	a)	What are the different schools of Software Testing? Explain.	CO1	8 Marks
	b)	Take a project and identify the Test Activities according to SDLC phases.	CO3	6 Marks

UNIT-II

3.	a)	What is the need of white-box testing? List out and explain various white box testing techniques.	CO2	8 Marks
	b)	Explain about Graph Matrices based testing technique.	CO2	6 Marks
		(OR)		
4.	a)	Explain loop testing with an example.	CO2	6 Marks
	b)	Write short notes on: i) Data Flow testing. ii) Mutation testing.	CO2	8 Marks

UNIT-III

5.	a)	Differentiate between White Box testing and Black Box testing techniques.	CO3	8 Marks
	b)	Explain about Boundary Value Analysis in detail.	CO3	6 Marks
		(OR)		
6.	a)	Explain about software Test management in detail.	CO3	8 Marks
	b)	What is meant by test plan? Give detailed test design for a sample test project.	CO3	6 Marks

UNIT-IV

7.	a)	What are Software metrics? Give an example.	CO4	8 Marks
	b)	Explain about size metrics in testing.	CO4	6 Marks
		(OR)		
8.	a)	What are the costs incurred in adopting a testing tool? List out with examples.	CO3	8 Marks
	b)	Differentiate between static and dynamic tools. Explain.	CO3	6 Marks

UNIT-V

9.	a)	What is meant by Regression Testing? Give an example.	CO4	8 Marks
	b)	Mention about Progressive testing and Regressive testing in detail.	CO4	6 Marks
		(OR)		
10.	a)	What is the use of automation? What are the costs involved in it? Explain.	CO5	8 Marks
	b)	How do you test a project with commercial testing tool? Explain.	CO5	6 Marks

CODE No.: 16BT60502 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

SOFT COMPUTING
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Compare and contrast neuro genetic and fuzzy genetic hybrid systems.	CO1	7 Marks
	b)	Discuss in detail application scope of neural networks.	CO4	7 Marks
		(OR)		
2.	a)	What is Hebb net? Design a Hebb network to realize logical OR function.	CO3	7 Marks
	b)	Write a short note on evolution of neural networks.	CO2	7 Marks

UNIT-II

3.	a)	What is the role of learning rule in perceptrons? Discuss about different learning rules.	CO1	7 Marks
	b)	Illustrate the flowchart for training process with suitable example.	CO2	7 Marks
		(OR)		
4.		Explain in detail back-propagation algorithm with an example.	CO5	14 Marks

UNIT-III

5.	a)	Differentiate supervised learning and unsupervised learning.	CO1	7 Marks
	b)	What is adaptive response theory? Discuss in detail.	CO2	7 Marks
		(OR)		
6.	a)	Illustrate the process involved in learning vector quantization.	CO2	7 Marks
	b)	What is fixed weight competitive nets? Discuss in detail.	CO5	7 Marks

UNIT-IV

7.	a)	What is Fuzzy sets and membership function? $A = \{ 0.1 / 2 + 0.6/ 3 + 0.4/ 4 + 0.3/ 5 + 0.8/ 6 \}$ $B = \{ 0.5/ 2 + 0.8/ 3 + 0.4/ 4 + 0.6/ 5 + 0.4/ 6 \}$ Calculate $A \cap B$, $B \cap A$ using fuzzy operation.	CO5	7 Marks
	b)	Write a short note on classical sets with an example.	CO1	7 Marks
		(OR)		
8.	a)	Differentiate tolerance relations and equivalence relations.	CO1	7 Marks
	b)	Explain about non-interactive fuzzy sets with an example.	CO2	7 Marks

UNIT-V

9.		Illustrate the working principle of genetic algorithm with suitable example.	CO6	14 Marks
		(OR)		
10.	a)	Write a short note on measures of fuzziness.	CO4	7 Marks
	b)	Discuss in detail extension principle.	CO1	7 Marks

CODE No.: 16BT60503 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

WIRELESS NETWORKS
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain Non- Persistent, I-Persistent and P- Persistent CSMA protocols.	CO2	8 Marks
	b)	Explain the principle, frame structures and working of TDMA system.	CO1	6 Marks
		(OR)		
2.	a)	Explain in detail the performance of the random access scheme for data oriented networks.	CO1	10 Marks
	b)	Mention some key factors that contribute to security problems in wireless networks.	CO2	4 Marks

UNIT-II

3.	a)	Explain in detail the random access for mobile data services and wireless LAN data services.	CO3	8 Marks
	b)	What are the advantages and disadvantages of CDMA cellular network?	CO3	6 Marks
		(OR)		
4.	a)	Explain in detail about wireless network operations.	CO2	10 Marks
	b)	Explain the techniques for improving coverage and capacity in cellular network.	CO4	4 Marks

UNIT-III

5.	a)	Explain IEEE802.11 with PHY and MAC layer.	CO3	10 Marks
	b)	Explain in detail about security requirements for wireless network.	CO3	4 Marks
		(OR)		
6.	a)	Write short notes on Home Access network.	CO5	7 Marks
	b)	Discuss the principle working of wireless LAN.	CO3	7 Marks

UNIT-IV

7.	a)	Mention the key features of IS-95 systems and explain packets and frame format of IS-95 reverse channel.	CO5	10 Marks
	b)	Write short notes on SMS operations.	CO5	4 Marks
		(OR)		
8.	a)	Write a short note on protocol layers in GPRS.	CO4	7 Marks
	b)	Explain the mechanisms that support a mobile environment.	CO5	7 Marks

UNIT-V

9.	a)	Describe overall architecture of HomeRF-Architecture.	CO6	8 Marks
	b)	Discuss how 3G Technology has revolutionized our lives in present scenario.	CO6	6 Marks
		(OR)		
10.	a)	Describe how the wireless home networking has changed the lives of the people in today's world.	CO6	7 Marks
	b)	Write short notes convergence layer.	CO5	7 Marks

CODE No.: 16BT60504 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

PRINCIPLES OF PROGRAMMING LANGUAGES

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Why is it useful for a programmer to have some background in language design, even though he or she may never actually design a programming language?	CO1	7 Marks
	b)	Explain the areas of computer applications and their associated languages.	CO1	7 Marks
		(OR)		
2.	a)	How pointers are implemented in Pascal?	CO2	7 Marks
	b)	List and explain briefly about user defined data types with examples.	CO1	7 Marks

UNIT-II

3.	a)	Explain about the switch statement in Algol with an example.	CO4	7 Marks
	b)	What is lazy evaluation? Explain the reasons why lazy evaluation may be desirable.	CO4	7 Marks
		(OR)		
4.	a)	Describe the different categories of control flow mechanisms.	CO3	7 Marks
	b)	Explain about control flow in Recursion.	CO3	7 Marks

UNIT-III

5.	a)	Explain about the models of parameter passing.	CO4	7 Marks
	b)	Explain about the co-routines with an example.	CO2	7 Marks
		(OR)		
6.	a)	Discuss about design issues of data abstraction.	CO3	7 Marks
	b)	List and explain about different abstract data types.	CO1	7 Marks

UNIT-IV

7.	a)	Define Monitor. Explain its concept.	CO2	7 Marks
	b)	Explain about the concurrency in Ada 95.	CO4	7 Marks
		(OR)		
8.	a)	Describe the java throwable class hierarchy and the types of exceptions. Can you claim multiple exceptions in a method declaration? Illustrate by means of an example.	CO2	7 Marks
	b)	What is exception? How to handle the exceptions in C++ with an example?	CO1	7 Marks

UNIT-V

9.	a)	Explain the applications of logic programming.	CO4	7 Marks
	b)	Describe about the search strategies in prolog.	CO4	7 Marks
		(OR)		
10.	a)	Explain the characteristics of functional programming languages.	CO4	7 Marks
	b)	Explain about the LISP, ML.	CO6	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

ARM PROCESSORS AND PIC MICROCONTROLLERS

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Differentiate microcontrollers versus general purpose microcontroller.	CO1	8 Marks
	b)	Write instructions to add the values 16H and CDH. Place the result in WREG register.	CO1	6 Marks

(OR)

2.	a)	Explain about file register and access bank in the PIC18.	CO2	8 Marks
	b)	Explain about: i) COMF. ii) DECF. iii) MOVFF.	CO2	6 Marks

UNIT-II

3.	a)	Select appropriate clock frequency and timer in required mode, write a program in assembly or C generate a square wave on port A pin 1 using timer with a duty cycle of 40% with and without interrupt.	CO3	7 Marks
	b)	Explain the time structure for use as a counter with a suitable example program.	CO1	7 Marks

(OR)

4.	a)	Explain about serial communication.	CO1	7 Marks
	b)	Write a program in assembly or C to read port A and transmit serially using interrupts with clock frequency of 1000MHZ and baud rate of 9600. For additional information refer to Register file summary provided for reference.	CO3	7 Marks

UNIT-III

5.	a)	Write a program to interface a 7 segment display.	CO4	7 Marks
	b)	Write a program to interface a DAC.	CO4	7 Marks

(OR)

6.	a)	Write a program to interface a LCD.	CO4	7 Marks
	b)	Write a program to interface a ADC.	CO4	7 Marks

UNIT-IV

7.	a)	With a neat sketch, explain the basic architecture of ARM cortex M3.	CO5	7 Marks
	b)	List the different stages of a pipeline of an ARM cortex M3 processor and explain them.	CO1	7 Marks

(OR)

8.	a)	List the registers present in different exception modes of ARM cortex M3 and explain the functionality of them.	CO1	7 Marks
	b)	Explain about various exception types in ARM.	CO1	7 Marks

UNIT-V

9.	a)	Explain about concept of pre indexing, auto indexing and post indexing using suitable examples.	CO1	7 Marks
	b)	Write an ALP to perform division of two numbers in ARM mode and then switch to thumb mode to perform subtraction.	CO6	7 Marks

(OR)

10.	a)	Demonstrate the use of the following instructions using suitable example. RSC, ADC, CMN, TST, BL.	CO1	7 Marks
	b)	Compare ARM mode and thumb p mode programming of ARM.	CO6	7 Marks

CODE No.: 16BT61002 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

PROCESS CONTROL INSTRUMENTATION
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Describe the mathematical model of liquid process.	CO3	7 Marks
	b)	Explain the characteristics of electric system.	CO1	7 Marks
		(OR)		
2.	a)	What are process elements? Explain each one.	CO1	7 Marks
	b)	Determine the transfer function of a single tank liquid level system.	CO2	7 Marks

UNIT-II

3.	a)	What are the advantages of the displacement type pneumatic controllers?	CO3	7 Marks
	b)	Explain the working of electronic PID controller with a neat diagram.	CO3	7 Marks
		(OR)		
4.		Explain the working of pneumatic PI controller with a neat diagram.	CO3	14 Marks

UNIT-III

5.	a)	Explain in detail about one-quarter decay ratio criteria.	CO4	7 Marks
	b)	Explain in detail about open-loop transient response method.	CO4	7 Marks
		(OR)		
6.		Explain in detail how time integral criteria lead to unique solution.	CO2	14 Marks

UNIT-IV

7.	a)	Explain in detail about solenoid.	CO5	7 Marks
	b)	Explain in detail about Sliding-stem control valve.	CO3	7 Marks
		(OR)		
8.		Explain in detail about pneumatic and electronic valve positioner.	CO5	14 Marks

UNIT-V

9.		Explain the applications of cascade control system. What are the advantages of cascade control and for what kind of process can you employ cascade control?	CO2	14 Marks
		(OR)		
10.		Compare cascade and signal loop control systems.	CO4	14 Marks

CODE No.: 16BT61005 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

OPTO-ELECTRONICS AND LASER INSTRUMENTATION

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Derive an expression for numerical aperture of a step Index fibre.	CO1	7 Marks
	b)	Describe what is meant by the fusion splicing of optical fibers. Discuss the advantages and drawbacks of these joining techniques.	CO1	7 Marks
		(OR)		
2.	a)	Derive an expression for the internal optical power level generated in LEDs.	CO1	7 Marks
	b)	The relative index difference between the core axis and the cladding of a graded index fibre is 0.7% when the refractive index at the core axis is 1.45. Estimate values for the numerical aperture of the fibre along the axis when the index profile is assumed to be triangular.	CO1	7 Marks

UNIT-II

3.	a)	Explain the interferometric method of measurement of length by using an optical fibre.	CO2	7 Marks
	b)	Explain the concept of polarization in optical fibers and discuss the polarization sensors.	CO3	7 Marks
		(OR)		
4.	a)	What are the properties that can be sensed using Fiber Optics?	CO3	7 Marks
	b)	Explain the concept of polarization in optical fibers and discuss the polarization sensors.	CO3	7 Marks

UNIT-III

5.	a)	Explain the liquid dye laser in detail.	CO6	7 Marks
	b)	Explain the construction and operation of ruby laser with a neat diagram.	CO6	7 Marks
		(OR)		
6.	a)	With the aid of energy band-diagram, explain HE-NE laser in detail.	CO6	7 Marks
	b)	Explain the construction and operation of gas laser with a neat diagram.	CO6	7 Marks

UNIT-IV

7.	a)	Explain about laser interaction with tissue.	CO6	7 Marks
	b)	Mention the advantages of laser surgery and photo thermal application.	CO5	7 Marks
		(OR)		
8.	a)	List and explain how lasers are used in nonlinear optics for basic sciences.	CO6	7 Marks
	b)	What are the areas of medical laser surgery where laser will be used?	CO5	7 Marks

UNIT-V

9.	a)	Describe the construction and reconstruction of hologram.	CO1	7 Marks
	b)	Explain about any three scientific applications of holography.	CO1	7 Marks
		(OR)		
10.		Define modulation and its types. Compare the types and explain about figure of merits.	CO1	14 Marks

CODE No.: 16BT61006 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

AIRCRAFT INSTRUMENTATION
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss the reconfiguration of aircraft systems.	CO1	7 Marks
	b)	List the problems experienced by Wright Brothers in their first error manned flight.	CO1	7 Marks
		(OR)		
2.	a)	Differentiate qualitative and quantitative instruments.	CO2	7 Marks
	b)	List the most important aircraft instruments.	CO1	7 Marks

UNIT-II

3.	a)	Calculate the mach number if aircraft is flying at a speed of 600 mph at sea level.	CO4	4 Marks
	b)	Describe with a suitable, how the static ports are used to measure the ambient atmospheric pressure?	CO5	10 Marks
		(OR)		
4.		With the help of a diagram, explain the operation of combined Pitot-static tube.	CO2	14 Marks

UNIT-III

5.	a)	Discuss the different errors in a directional gyro.	CO1	7 Marks
	b)	What are the limitations of a directional gyroscope?	CO1	7 Marks
		(OR)		
6.		List the properties of mechanical gyros and explain mechanical gyros with a neat sketch.	CO1	14 Marks

UNIT-IV

7.		Define the Engine Pressure Ratio and how is it measured in a jet engine.	CO5	14 Marks
		(OR)		
8.		How does an electromagnetic vibrating pickup work? Discuss with the help of a block schematic diagram the construction and operation of a dedicated vibration monitoring system using an electromagnetic pickup.	CO5	14 Marks

UNIT-V

9.		Explain Flight director system with a neat sketch.	CO1	14 Marks
		(OR)		
10.		How does a compensating probe compensate for changes in fuel's dielectric constant? Draw the sketch of a compensating probe along with the main probe.	CO3	14 Marks

CODE No.: 16BT61041 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

PROGRAMMABLE LOGIC CONTROLLERS

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Explain the principle of operation of discrete ac input and output modules used in PLC with suitable diagrams.	CO1	14 Marks
		(OR)		
2.	a)	Draw the block diagram of I/O modules and explain it.	CO1	7 Marks
	b)	Explain about Fail-safe circuits.	CO1	7 Marks

UNIT-II

3.	a)	Implement following logic gates in ladder diagram. 3 Input AND gate 2 Input NAND gate 3 Input NOR gate 2 Input NOR gate.	CO2	7 Marks
	b)	How will high speed counter module works describe with suitable application.	CO2	7 Marks
		(OR)		
4.		Explain ladder diagram construction and flow chart for spray process system.	CO2	14 Marks

UNIT-III

5.	a)	Explain about MOVE, FIFO functions and their applications.	CO3	7 Marks
	b)	Describe the number conversion functions.	CO3	7 Marks
		(OR)		
6.	a)	Explain Master control relay functions.	CO3	7 Marks
	b)	Describe the Arithmetic functions.	CO1	7 Marks

UNIT-IV

7.	a)	Explain how bit patterns in registers can be used in machine control.	CO4	7 Marks
	b)	Explain basic two-axis robot with PLC sequencer control.	CO6	7 Marks
		(OR)		
8.	a)	Use matrix functions in combination to simulate combination gates such as NAND and NOR in PLC.	CO4	7 Marks
	b)	Explain how to change a Register Bit Status in detail.	CO5	7 Marks

UNIT-V

9.	a)	Explain various programming languages in PLC.	CO5	7 Marks
	b)	A machine is connected to a load cell that outputs a voltage. Proportional to the mass on a platform, when unloaded the cell outputs a voltage of 1V. A mass of 500Kg results in a 6V output. Write a program that will measure the mass when an input sensor (M) becomes true. If the mass is not between 300Kg and 400Kg and alarm output (A) will be turned on. Write a program and indicate the general settings for the analog I/O.	CO4	7 Marks
		(OR)		
10.	a)	Describe PID tuning functions and methods.	CO4	7 Marks
	b)	Explain about PLC auxiliary commands and functions.	CO5	7 Marks

❀ ❀ ❀

CODE No.: 16BT61201 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

CLOUD COMPUTING

[Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define Data center. Explain the need and benefits of virtualization on Data center.	CO1	7 Marks
	b)	Describe the types of virtualization in cloud computing with suitable examples.	CO1	7 Marks
		(OR)		
2.		Compare the services and applications of Hyper-V and VMware virtualization technologies.	CO2	14 Marks

UNIT-II

3.	a)	Discuss the risks and challenges in cloud computing.	CO1	7 Marks
	b)	Interpret the critical cloud computing challenges pertaining to IT resources in public clouds.	CO1	7 Marks
		(OR)		
4.		State and explain various cloud deployment models with suitable examples.	CO1	14 Marks

UNIT-III

5.	a)	Illustrate multitenant technologies with suitable examples.	CO2	7 Marks
	b)	State the web based services to process data in cloud computing.	CO1	7 Marks
		(OR)		
6.		Classify and analyze the components in cloud bursting architecture, elastic disk provisioning architecture and redundant storage architectures with neat sketch.	CO4	14 Marks

UNIT-IV

7.	a)	Explain various applications of cloud security.	CO6	7 Marks
	b)	Explain cloud scale for disaster recovery in cloud.	CO2	7 Marks
		(OR)		
8.		Analyze various disasters that can occur in cloud. Evaluate the appropriate recovery measures.	CO2	14 Marks

UNIT-V

9.	a)	Compare and contrast IaaS, PaaS and SaaS with suitable examples each.	CO2	7 Marks
	b)	Design and develop a web application in Google App Engine.	CO5	7 Marks
		(OR)		
10.		Outline the features of Amazon EC2 cloud and develop an Amazon Machine Instance on EC2 cloud	CO4	14 Marks

CODE No.: 16BT61202 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

AD-HOC AND WIRELESS SENSOR NETWORKS
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the applications of Ad-hoc wireless networks.	CO1	5 Marks
	b)	Explain about the following issues which affect the design, deployment and performance of an Ad-hoc wireless system. i) Medium access scheme. ii) Routing. iii) Multicasting.	CO2	9 Marks
		(OR)		
2.	a)	Explain the following contention based MAC protocols of Ad-hoc networks. i) MACA. ii) MACAW.	CO1	9 Marks
	b)	Draw and explain the frame structure in D-PRMA protocol.	CO1	5 Marks

UNIT-II

3.	a)	With suitable example, explain establishment and route maintenance in DSR.	CO4	7 Marks
	b)	Write about hierarchical state routing protocol. Discuss the advantages of hierarchical topology based protocols over protocols that use flat topology.	CO5	7 Marks
		(OR)		
4.	a)	Explain the table driven routing protocol DSDV in detail.	CO5	8 Marks
	b)	Discuss the following phases of on demand multicast routing protocol. i) Mesh initialization phase. ii) Mesh maintenance phase.	CO5	6 Marks

UNIT-III

5.	a)	Why does TCP not perform well in Ad-hoc wireless networks?	CO2	7 Marks
	b)	Explain the working, advantages and disadvantages of TCP-ELFN.	CO2	7 Marks
		(OR)		
6.	a)	List and explain the network security requirements.	CO1	5 Marks
	b)	Discuss about some of the multi-layer attacks in Ad-hoc wireless networks.	CO2	9 Marks

UNIT-IV

7.	a)	Explain the following design choices for providing QOS system. i) Hard state versus soft state resources reservation. ii) Stateful versus Stateless approach. iii) Hard QOS versus soft QOS.	CO4	9 Marks
	b)	Describe the layer wise classification of QOS solutions.	CO4	5 Marks
		(OR)		
8.		Explain in detail about transmission power management schemes.	CO3	14 Marks

UNIT-V

9.	a)	Describe the power efficient gathering for sensor information systems.	CO3	7 Marks
	b)	Compare wireless sensor networks with Ad-hoc wireless networks.	CO1	7 Marks
		(OR)		
10.		List and explain various MAC protocols of wireless sensor networks.	CO2	14 Marks

CODE No.: 16BT61501 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

DATA WAREHOUSING AND DATA MINING

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the three-tier data warehouse architecture and its various components.	CO3	7 Marks
	b)	Describe the multidimensional data model with neat sketch.	CO2	7 Marks
		(OR)		
2.	a)	What is a data warehouse? Distinguish between operational database system and data warehouses.	CO1	7 Marks
	b)	What are OLAP operations in the multidimensional data model? Explain.	CO3	7 Marks

UNIT-II

3.	a)	What is data cleaning? Describe the approaches to fill missing values.	CO2	7 Marks
	b)	What is datamining? Briefly explain the knowledge discovery process.	CO1	7 Marks
		(OR)		
4.	a)	Briefly describe various forms of data preprocessing.	CO3	7 Marks
	b)	Describe in detail datamining functionalities and the different kinds of patterns can be mined.	CO5	7 Marks

UNIT-III

5.	a)	Discuss the F-P growth algorithm with an example.	CO4	7 Marks
	b)	What is association and correlation? With an example, describe classification and prediction.	CO2	7 Marks
		(OR)		
6.	a)	Elucidate the steps in the decision tree classification process with an example.	CO4	7 Marks
	b)	Discuss the Apriori algorithm with an example.	CO4	7 Marks

UNIT-IV

7.	a)	Describe different grid-based methods in cluster analysis.	CO2	7 Marks
	b)	What do you mean by clustering? Explain different types of clusters.	CO1	7 Marks
		(OR)		
8.	a)	Write the DBSCAN algorithm and explain.	CO5	7 Marks
	b)	What is partitioning method? Describe k-means clustering algorithm.	CO1	7 Marks

UNIT-V

9.	a)	What is multimedia data? Briefly describe the similarity search in multimedia data.	CO2	7 Marks
	b)	What is text mining? Describe about basic measures for text retrieval.	CO2	7 Marks
		(OR)		
10.	a)	How web usage mining different from web structure mining and web content mining.	CO2	7 Marks
	b)	Discuss about spatial mining and its applications.	CO1	7 Marks

CODE No.: 16BT61502 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

NETWORK SECURITY
[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define DOS attack. Explain various types of DOS attacks with suitable examples.	CO1	8 Marks
	b)	Discuss the benefits of good security practices.	CO1	6 Marks
		(OR)		
2.	a)	How to perform IP spoofing attack?	CO1	8 Marks
	b)	Differentiate passive and active attacks.	CO1	6 Marks

UNIT-II

3.	a)	With a neat sketch, explain the working, advantages and disadvantages of packet filtering firewall.	CO4	8 Marks
	b)	Describe the firewall rules for the router and firewall architecture.	CO4	6 Marks
		(OR)		
4.	a)	List and explain about the key components of a VPN.	CO6	7 Marks
	b)	Describe the user VPN configuration and issues.	CO6	7 Marks

UNIT-III

5.	a)	What are the requirements of random numbers? Discuss various pseudo random number generators.	CO3	6 Marks
	b)	Draw and explain the symmetric encryption model and its principles.	CO2	8 Marks
		(OR)		
6.	a)	Explain how to generate stream using RC4 algorithm.	CO2	10 Marks
	b)	List all the advantages of CTR mode.	CO3	4 Marks

UNIT-IV

7.	a)	How to provide message authentication using MAC and one way hash functions.	CO6	5 Marks
	b)	Discuss the generation of message digest using SHA 512 algorithm.	CO6	9 Marks
		(OR)		
8.	a)	Explain the public key cryptography principles.	CO2	8 Marks
	b)	Perform encryption and decryption using the RSA algorithm if $p = 7$, $q = 11$, $e = 17$ and $M = 8$.	CO2	6 Marks

UNIT-V

9.	a)	What is the role of honey pot in intrusion detection?	CO5	5 Marks
	b)	Discuss about the following malicious software's.	CO5	9 Marks
		(OR)		
10.	a)	Explain the phases and structure of virus.	CO5	8 Marks
	b)	List and explain the four generations of antivirus software's.	CO5	6 Marks

CODE No.: 16BT71202 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

MOBILE APPLICATION DEVELOPMENT
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Explain the mobile web presence briefly.	CO1	7 Marks
	b)	Explain the reasons to create a mobile application.	CO1	7 Marks
		(OR)		
2.	a)	Explain the behavior of mobile user web browsing.	CO1	7 Marks
	b)	What is Android and explain its features.	CO1	7 Marks
		UNIT-II		
3.	a)	Sketch the life cycle of an Activity and discuss its events.	CO1	7 Marks
	b)	Develop an android program to illustrate the usage of all events of an activity.	CO3	7 Marks
		(OR)		
4.		Create an Android application to add action items to the action bar.	CO4	14 Marks
		UNIT-III		
5.	a)	Create an Android application to display the long list of items using List View.	CO4	7 Marks
	b)	List and explain the different views for displaying images.	CO1	7 Marks
		(OR)		
6.	a)	Develop an Android program to perform image transition using Image Switcher View.	CO3	9 Marks
	b)	Distinguish different ways to save and load of User Preferences.	CO2	5 Marks
		UNIT-IV		
7.	a)	Create an Android application to send SMS message using Intent class.	CO6	7 Marks
	b)	Develop an Android program to zoom in or zoom out of the Google Map.	CO3	7 Marks
		(OR)		
8.	a)	Discuss the procedure to prevent the standard messaging application from receiving a SMS message.	CO1	7 Marks
	b)	Create an Android application to send an e-mail.	CO6	7 Marks
		UNIT-V		
9.	a)	Discuss the tools required to develop the applications for an iOS.	CO5	7 Marks
	b)	Define Service and discuss the functionality a Service with a suitable example.	CO1	7 Marks
		(OR)		
10.	a)	Outline the anatomy of an iOS app.	CO1	7 Marks
	b)	Develop an Android program to start a counter from zero and stop the counter using Runnable, Thread and AsyncTask.	CO3	7 Marks

CODE No.: 16BT71204 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021

MOBILE COMPUTING

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss the applications and limitations of Mobile Computing.	CO1	7 Marks
	b)	Define Mobile Computing? List the features of Mobile Computing.	CO1	7 Marks
		(OR)		
2.	a)	Draw WCDMA protocol layered Architecture between MS and BTS.	CO5	7 Marks
	b)	Elaborate the features of Long Term Evolution (LTE).	CO5	7 Marks

UNIT-II

3.	a)	Compare explicit reservation and implicit reservation schemes with a timing diagram.	CO2	7 Marks
	b)	Assume all stations can hear all other stations. One station wants to transmit and senses the carrier idle. Why can a collision still occur after the start of transmission? Analyze and provide solution.	CO2	7 Marks
		(OR)		
4.	a)	Elaborate various protocols used to provide Bluetooth security.	CO4	7 Marks
	b)	Discuss the basic structure of an IEEE 802.11 MAC data frame together with the content of frame control field.	CO4	7 Marks

UNIT-III

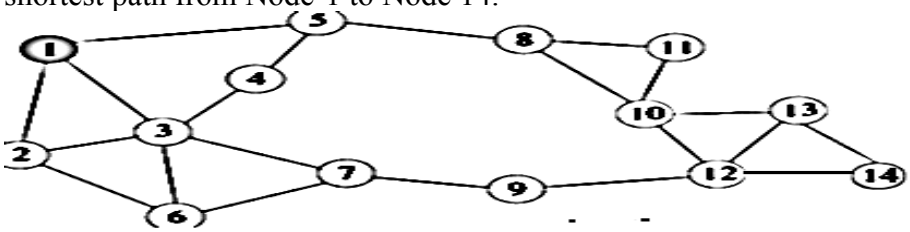
5.	a)	Explain the basic purpose of DHCP. Name the entities of DHCP. How can DHCP be used for mobility and support of mobile IP?	CO1	7 Marks
	b)	Discuss the advantages and disadvantages of three encapsulation methods in mobile IP.	CO1	7 Marks
		(OR)		
6.	a)	Explain the concept of Indirect TCP. How it is helpful for handover between different access points?	CO1	7 Marks
	b)	Explain mobile TCP and its advantages and disadvantages.	CO1	7 Marks

UNIT-IV

7.	a)	Compare database hoarding and data caching. Describe Database hoarding techniques.	CO2	7 Marks
	b)	Justify how web cache is maintained in mobile Environment.	CO2	7 Marks
		(OR)		
8.		Summarize on following Indexing techniques: i) (I, M) indexed method. ii) Distributed Index-based method.	CO1	14 Marks

UNIT-V

9.		Apply AODV Routing algorithm for the following network to find the shortest path from Node-1 to Node 14.	CO3	14 Marks



(OR)

10.		Sketch the WAP architecture. Explain its layers and components briefly.	CO1	14 Marks

❀ ❀ ❀

CODE No.: 16BT71205 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

CRYPTOGRAPHY AND NETWORK SECURITY

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Sketch the model for network security and discuss each of its components.	CO1	7 Marks
	b)	List and briefly define categories of passive and active security attacks.	CO1	7 Marks
		(OR)		
2.	a)	Decipher the message YITJP GWJOW FAQTQ XCSMA ETSQU SQAPU SQGKC PQTYJ using the Hill cipher with the inverse key $\begin{bmatrix} 5 & 1 \\ 2 & 7 \end{bmatrix}$. Show your calculations and result.	CO3	8 Marks
	b)	Distinguish between monoalphabetic cipher and polyalphabetic cipher.	CO2	6 Marks

UNIT-II

3.	a)	Discuss about strengths of DES.	CO2	5 Marks
	b)	Illustrate Diffie Hellman key Exchange in detail with an example.	CO3	9 Marks
		(OR)		
4.	a)	Describe the key management of public key encryption in detail.	CO3	7 Marks
	b)	Explain RSA Algorithm with the following: P=11, q=5, e=3 and PT=9.	CO4	7 Marks

UNIT-III

5.	a)	What is message authentication? List out various attacks that are to be identified while communication across a network. What are possible solutions to those attacks?	CO3	8 Marks
	b)	Discuss about Message Authentication methods.	CO3	6 Marks
		(OR)		
6.	a)	Describe how SHA-512 is used to generate Message Digest and how it is different from SHA-1?	CO4	8 Marks
	b)	Elaborate on Digital Signature standard and the approach used in it to provide security.	CO4	6 Marks

UNIT-IV

7.	a)	Describe the architecture of IPSec.	CO6	7 Marks
	b)	Discuss about PGP message generation and reception.	CO5	7 Marks
		(OR)		
8.	a)	Briefly explain Encapsulating IP Security Payload.	CO6	9 Marks
	b)	Differentiate between SSL and SET.	CO6	5 Marks

UNIT-V

9.	a)	What is an audit record? What is the use of audit record in intrusion detection?	CO6	8 Marks
	b)	Explain about counter measures to be considered for DDoS attacks.	CO4, CO6	6 Marks
		(OR)		
10.	a)	Write a short note on: i) Viruses. ii) Firewalls.	CO5	7 Marks
	b)	Discuss about spear phishing and phishing countermeasures.	CO5	7 Marks

❀ ❀ ❀

CODE No.: 19BM60501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

DATA SCIENCE

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Discuss unstructured data and explain its challenges.	6 Marks	L2	CO1	PO2
	b)	Explain the need of data reduction.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Explain the principles associated with open data.	6 Marks	L2	CO1	PO1
	b)	Discuss the role descriptive analysis in data science.	6 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	Explain user retention with an appropriate example.	6 Marks	L3	CO2	PO2
	b)	Compare filters and wrappers.	6 Marks	L4	CO2	PO4
		(OR)				
4.	a)	Explain entropy with an example.	6 Marks	L3	CO2	PO2
	b)	Illustrate decision tree with areal-time example.	6 Marks	L4	CO2	PO6
		UNIT-III				
5.	a)	Draw a simple line plot using matplotlib API Primer.	6 Marks	L3	CO3	PO5
	b)	Design a pair plot matrix of statsmodels.	6 Marks	L3	CO3	PO5
		(OR)				
6.	a)	Design a simple Simple Series plot with pandas.	6 Marks	L3	CO3	PO5
	b)	Plot a histogram using pandas/ seaborn with an appropriate example.	6 Marks	L3	CO3	PO5
		UNIT-IV				
7.	a)	Explain how the goals depend on the reporting results.	6 Marks	L2	CO4	PO3
	b)	Discuss how the PMFs can be limited with an example.	6 Marks	L2	CO4	PO2
		(OR)				
8.	a)	Explain histogram by designing it for pound part of birth weight.	6 Marks	L4	CO4	PO6
	b)	Illustrate how percentiles are used to tackle the cumulative distribution function.	6 Marks	L4	CO4	PO4
		UNIT-V				
9.	a)	Illustrate Serial Correlation with an example.	6 Marks	L3	CO5	PO2
	b)	Explain the steps involved in building a model for sentiment analysis for micro-blogging websites.	6 Marks	L2	CO5	PO6
		(OR)				
10.	a)	Discuss the three sources of error should be taken into account for prediction accuracy.	6 Marks	L2	CO5	PO2
	b)	Illustrate the Model factory architecture used for Building Big Data Predictive Model Solutions.	6 Marks	L4	CO5	PO3

CODE No.: 19BM60503 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

MACHINE LEARNING

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss Concept learning as search with respect to General to specific ordering of hypothesis.	6 Marks	L2	CO1	PO1
	b)	Illustrate Find S Algorithm over EnjoySport concept. Training instances given below.	6 Marks	L4	CO5	PO4

Example	Sky	AirTemp	Humidity	Wind	Water	Forecast	EnjoySport
1	Sunny	Warm	Normal	Strong	Warm	Same	Yes
2	Sunny	Warm	High	Strong	Warm	Same	Yes
3	Rainy	Cold	High	Strong	Warm	Change	No
4	Sunny	Warm	High	Strong	Cool	Change	Yes

(OR)

2.	a)	Apply candidate elimination algorithm to obtain the final version space.	6 Marks	L4	CO5	PO4

Origin	Manufacturer	Color	Decade	Type	Example Type
Japan	Honda	Blue	1980	Economy	Positive
Japan	Toyota	Green	1970	Sports	Negative
Japan	Toyota	Blue	1990	Economy	Positive
USA	Chrysler	Red	1980	Economy	Negative
Japan	Honda	White	1980	Economy	Positive

	b)	Explain Version Space and Representation of version Space with an example.	6 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Describe the following with examples: i) Decision Tree. ii) Decision Tree Learning. iii) Decision Tree Representation.	6 Marks	L2	CO2	PO1
	b)	Explain about SVMs for classification.	6 Marks	L2	CO2	PO2

(OR)

4.	a)	Discuss Inductive Bias in Decision Tree Learning.	6 Marks	L2	CO2	PO1
	b)	Explain about Support Vector Machines.	6 Marks	L2	CO2	PO1

UNIT-III

5.	a)	Explain how to learn Multilayer Networks using Back propagation Algorithm.	6 Marks	L2	CO4	PO1
	b)	Briefly explain about Convergence and Local Minima of MLP.	6 Marks	L2	CO4	PO1

(OR)

6.	a)	Explain about, Hypothesis space search and inductive bias.	6 Marks	L2	CO2	PO1
	b)	Demonstrate under what conditions the perceptron rule fails and it becomes necessary to apply the delta rule.	6 Marks	L2	CO5	PO4

UNIT-IV

7.	a)	Explain the concept of EM algorithm. Discuss what are Gaussian Mixtures.	6 Marks	L2	CO2	PO1
	b)	Explain Bayesian belief network with example.	6 Marks	L2	CO2	PO1

(OR)

8.	a)	Discuss Maximum Likelihood and Least Square Error Hypothesis.	6 Marks	L2	CO2	PO1
	b)	Discuss Learning to Classify Text with example.	6 Marks	L2	CO2	PO2

UNIT-V

9.	a)	Discuss the learning tasks and Q learning in the context of reinforcement learning.	6 Marks	L2	CO2	PO1
	b)	Explain K-Nearest Neighbor Learning.	6 Marks	L2	CO2	PO1

(OR)

10.	a)	Write the algorithm for the K-Nearest Neighbor for approximating a discrete-valued function.	6 Marks	L2	CO3	PO3
	b)	Write the algorithm for Q learning with example.	6 Marks	L2	CO3	PO3

CODE No.: 19BT6HS01 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

PRINCIPLES OF BUSINESS ECONOMICS AND ACCOUNTANCY

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Explain diagrammatically, the Law of Demand. Give its importance. Why is this law not applicable for Giffen goods?	12 Marks	L2	CO1	PO3
		(OR)				
2.		Discuss the usefulness of demand forecasting. Explain the various methods of demand forecasting.	12 Marks	L2	CO1	PO2

UNIT-II

3.	a)	Explain the Law of Variable Proportions. What are the causes of its application?	6 Marks	L2	CO2	PO1
	b)	Explain in detail the various cost concepts. Also explain the relationship between AC and MC.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Break-Even Analysis assumes that variable cost and revenue are linear and that fixed cost is fixed. Briefly explain it through the help of diagram.	6 Marks	L2	CO2	PO3
	b)	**From the following data, you are required to calculate:** i) P/V ratio. ii) Break-even sales with the help of P/V ratio. iii) Sales required to earn a profit of Rs. 4,50,000 Fixed Expenses = Rs. 90,000 Variable Cost per unit: Direct Material = Rs. 5 Direct Labour = Rs. 2 Direct Overheads = 100% of Direct Labour Selling Price per unit = Rs. 12.	6 Marks	L2	CO2	PO3

UNIT-III

5.		Explain the price output determination under monopoly both in short run and long run time periods.	12 Marks	L3	CO3	PO2
		(OR)				
6.		Explain the laws of return to scale. Explain the reasons of return to scale.	12 Marks	L3	CO3	PO3

UNIT-IV

7.		Describe the basic concepts and conventions of accounting. What is basic accounting equation?	12 Marks	L3	CO4	PO3
		(OR)				

8.	From the following ledger balances of M/s Aravind and Company as on 31-12-2013, prepare Trial Balance. All figures are given in Rupees. i) Capital 72000 ii) Creditors 17440 iii) Bills Payable 5054 iv) Sales 156364 v) Loan 24000 vi) Debtors 7770 vii) Salaries 8000 viii) Discount-Dr 2000 ix) postage 546 x) bad debts 574 xi) interest-Dr 2590 xii) insurance 834 xiii) Machinery 20000 xiv) Stock as on 01.01.13 = 19890 xv) purchases 124000 xvi) Wages 8600 xvii) buildings 47560 xviii) Furniture 32310 and xix) Vehicles 28600.	12 Marks	L3	CO4	PO1

UNIT-V

9.	**prepare Profit and Loss account from the following particulars for the year ended March 31, 2021:**	12 Marks	L4	CO5	PO2

Gross Profit	Rs. 4,50,000
Commission Received	Rs.40,000
Rent, tax, and Insurance	Rs.10,000
Export Duty	Rs.15,000
Rent Received	Rs.20,000
Discount Received	Rs.24,000
Audit Fees	Rs.5,000
Dividend Received	Rs.16,000
Depreciation	Rs.24,000
Administration Expenses	Rs.35,000
Selling Expenses	Rs.25,000
Printing and Stationery	Rs.15,000
Distribution Expenses	Rs.28,000
Office Expenses	Rs.32,000
Trade Expenses	Rs.50,000
General Expenses	Rs.25,000
Carriage outward	Rs.15,000

(OR)

10.	Explain the types of financial statements in financial accounts with illustrations.	12 Marks	L4	CO5	PO3

CODE No.: 19BT6HS02 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

ORGANIZATIONAL BEHAVIOUR

[Civil Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	What is organizational behavior? Explain its nature and scope.	6 Marks	L2	CO1	PO1
	b)	Explain the features of organizational behavior.	6 Marks	L2	CO1	PO1
		(OR)				
2.		Describe the emerging issues and challenges of organizational behavior.	12 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Explain the role of brain and mind in individual behaviors.	6 Marks	L2	CO2	PO1
	b)	What are attitudes? Explain the functions of attitudes.	6 Marks	L2	CO2	PO1
		(OR)				
4.		Discuss various models of man with their implication on organizational behavior.	12 Marks	L2	CO2	PO1
		UNIT-III				
5.	a)	Explain about inter personal perception in detail.	6 Marks	L2	CO3	PO9
	b)	What is a group? Explain the need for formation of groups.	6 Marks	L2	CO3	PO9
		(OR)				
6.		Discuss the different stages of group development.	12 Marks	L3	CO3	PO9
		UNIT-IV				
7.	a)	Discuss various sources of power of a leader.	6 Marks	L2	CO4	PO2
	b)	Explain the charismatic and transformational theories of leadership.	6 Marks	L3	CO4	PO2
		(OR)				
8.		Discuss different leadership styles.	12 Marks	L3	CO4	PO1
		UNIT-V				
9.	a)	What is organizational change? Explain the reasons for change.	6 Marks	L3	CO5	PO12
	b)	Explain the steps to be taken by the management to overcome the resistance to change.	6 Marks	L3	CO5	PO2
		(OR)				
10.		Explain the organizational development process.	12 Marks	L4	CO5	PO12

CODE No.: 19BT50403 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

VLSI DESIGN

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Interpret the basic RTL and TTL circuit diagram with its truth table.	6 Marks	L1	CO1	PO2
	b)	Describe the circuit diagram of 3 input DTL NAND gate using transistors and explain its operation.	6 Marks	L1	CO1	PO1
		(OR)				
2.		Illustrate CMOS Steady state electrical behavior. i) Logic levels. ii) Noise margin. iii) Fanout. iv) Effect of loading and unused inputs.	12 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	Paraphrase the transfer characteristics nMOS enhancement mode fabrication process for different conditions.	6 Marks	L2	CO2	PO2
	b)	Derive an expression for transconductance of an n-channel enhancement MOSFET operating in active region.	6 Marks	L2	CO2	PO2
		(OR)				
4.	a)	Describe a step-by-step procedure for a typical Twin Tub CMOS process with neat diagrams.	6 Marks	L1	CO2	PO1
	b)	Analyze pull up to pull down ratio of NMOS driven to another NMOS inverter with necessary equations.	6 Marks	L4	CO2	PO2
		UNIT-III				
5.	a)	Draw a stick diagram and layout for two input CMOS NAND gate indicating all the regions and layers.	6 Marks	L1	CO3	PO1
	b)	Explain 2 μm Double Metal, Double Poly CMOS / BiCMOS Rules.	6 Marks	L1	CO3	PO1
		(OR)				
6.	a)	Define and explain the standard units of capacitance.	6 Marks	L1	CO3	PO1
	b)	Calculate the gate capacitance value of 5 mm technology minimum size transistor with gate to channel value is 4×10^{-4} pF/mm^2.	6 Marks	L1	CO3	PO1
		UNIT-IV				
7.	a)	Design 4 bit carry look ahead adder.	6 Marks	L2	CO4	PO2
	b)	Design Conditional Sum Adder for given inputs A=11010011 and B =10001011.	6 Marks	L2	CO4	PO3
		(OR)				
8.	a)	With neat circuit diagram, Analyze the operation of i) Manchester carry chain adder ii) Array Multiplier.	6 Marks	L2	CO4	PO2
	b)	With neat circuit diagram, analyze the operation of Array Multiplier.	6 Marks	L2	CO4	PO2

UNIT-V

9.	a)	Draw the architecture of CPLD and explain in detail.	6 Marks	L2	CO5	PO2
	b)	Design a 6 transistor SRAM cell in CMOS logic.	6 Marks	L2	CO5	PO3
		(OR)				
10.	a)	With the necessary diagrams explain operation of DRAM. Show its timing diagram.	6 Marks	L2	CO5	PO2
	b)	Design a 4-bit ripple counter and draw the timing diagram of that counter.	6 Marks	L2	CO5	PO3

CODE No.: 19BT50406 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

FPGA ARCHITECTURES AND APPLICATIONS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Illustrate the Read-Only Memory with n Inputs and m Outputs.	6 Marks	L2	CO1	PO2
	b)	Design the following Boolean functions using PLA, $F_0 = \sum m(0,1,4,6)$, $F_1 = \sum m(2,3,4,6,7)$.	6 Marks	L6	CO1	PO3
		(OR)				
2.	a)	Design a Full Adder Using a PAL.	6 Marks	L6	CO1	PO3
	b)	Compare various Programmable Logic Devices.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Outline the concept of SRAM Programming Technology.	6 Marks	L2	CO2	PO2
	b)	With neat sketch, explain Look-Up Table–Based Programmable Logic Blocks.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Classify Interconnects in Symmetric Array FPGAs and explain in detail.	6 Marks	L2	CO2	PO1
	b)	Sketch the Programmable I/O Block for an FPGA and explain.	6 Marks	L2	CO2	PO2
		UNIT-III				
5.	a)	List out the Advantages and Disadvantages of SRAM Programming.	6 Marks	L2	CO3	PO1
	b)	Brief the Block-to-Interconnect Connections of XC2000.	6 Marks	L2	CO3	PO2
		(OR)				
6.	a)	Explain in detail about the Wiring Architecture of Xilinx XC3000.	6 Marks	L2	CO3	PO2
	b)	With neat sketch, interpret the XC4000 IO Block.	6 Marks	L3	CO3	PO2
		UNIT-IV				
7.	a)	Interpret the Principles of Programmable Routing.	6 Marks	L2	CO3	PO2
	b)	List out the characteristics of the programming element of FPGA architecture.	6 Marks	L2	CO3	PO1
		(OR)				
8.	a)	Explain Logic Module of Act-1 architecture.	6 Marks	L2	CO3	PO1
	b)	Brief the Sequential Module of Act-2 architecture.	6 Marks	L2	CO3	PO2
		UNIT-V				
9.	a)	Design a five bit binary counter with ACT devices.	6 Marks	L6	CO4	PO2
	b)	Write a short note on a position tracker for a robot manipulator.	6 Marks	L1	CO4	PO3
		(OR)				
10.	a)	Brief about a fast DMA Controller.	6 Marks	L2	CO4	PO1
	b)	Illustrate the design of fast video controller.	6 Marks	L6	CO4	PO2

CODE No.: 19BT50502 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

ARTIFICIAL INTELLIGENCE

[Information Technology]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		Define in your own words the following terms: agent, agent function, agent program, rationality, autonomy, task environment.	12 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Write brief notes of any three disciplines that contributed ideas, viewpoints, and techniques to AI.	6 Marks	L2	CO1	PO1
	b)	Discuss the risks and benefits AI can bring.	6 Marks	L2	CO1	PO6
		UNIT-II				
3.	a)	With the aid of an example, explain the working of greedy best-first search.	6 Marks	L2	CO2	PO2
	b)	Suppose two friends live in different cities on a map. On every turn, we can simultaneously move each friend to a neighboring city on the map. The amount of time needed to move from city **i** to neighbor **j** is equal to the road distance **d(i, j)** between the cities, but on each turn the friend that arrives first must wait until the other one arrives (and calls the first on his/her cell phone) before the next turn can begin. We want the two friends to meet as quickly as possible. Write a detailed formulation for this search problem.	6 Marks	L3	CO2	PO2
		(OR)				
4.	a)	Trace the operation of **A*** search applied to the problem of getting to Bucharest from Lugoj using the straight-line distance heuristic. That is, show the sequence of nodes that the algorithm will consider and the f, g, and h score for each node.	6 Marks	L3	CO2	PO2
	b)	Explain why problem formulation must follow goal formulation.	6 Marks	L2	CO2	PO2
		UNIT-III				
5.	a)	Describe how to solve travelling salesperson problem using hill climbing technique.	6 Marks	L3	CO2	PO3
	b)	Explain local beam search. What are its limitations? Describe how to alleviate them using stochastic beam search.	6 Marks	L2	CO2	PO2
		(OR)				
6.	a)	Discuss how to extend the minimax idea to multiplayer games.	6 Marks	L2	CO2	PO2
	b)	Describe the role of Alpha-Beta pruning in reducing the number of game states.	6 Marks	L2	CO2	PO2
		UNIT-IV				
7.	a)	Describe the semantics of Bayesian networks.	6 Marks	L2	CO3	PO2
	b)	How to formulate the basic inference tasks of a generic temporal model? Explain.	6 Marks	L2	CO3	PO2
		(OR)				

8.		Explain the concept of Hidden Markov Model (HMM).	12 Marks	L2	CO3	PO1
		UNIT-V				
9.	a)	Describe the role of probabilistic filtering algorithms such as Kalman filters and particle filters for robot perception.	6 Marks	L2	CO4	PO1
	b)	Discuss any 3 application domains of robots.	6 Marks	L2	CO5	PO6
		(OR)				
10.		Analyze the potential threats from AI technology to society. What threats are most serious, and how might they be combated? How do they compare to the potential benefits?.	12 Marks	L4	CO5	PO6 PO8

CODE No.: 19BT50503 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

CYBER SECURITY

[Information Technology]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain in keen the need for Cyberlaws in Indian context.	6 Marks	L1	CO1	PO1
	b)	List and analyze various classifications of cybercrime.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Explain in keen global perspective on cybercrimes.	6 Marks	L1	CO1	PO1
	b)	Discuss in detail about cybercrime and information security.	6 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Explain the process on how criminal plan the attacks with appropriate example.	6 Marks	L1	CO1	PO1
	b)	Explain in detail Cyber Stalking and its types.	6 Marks	L1	CO1	PO1
		(OR)				
4.	a)	List and explain various types of Identity Thefts.	6 Marks	L2	CO1	PO2
	b)	Explain various types of phishing techniques.	6 Marks	L1	CO1	PO2
		UNIT-III				
5.	a)	Illustrate with a neat sketch about proliferation of mobile and wireless devices.	6 Marks	L2	CO3	PO3
	b)	Brief on all possible attacks on mobile/cell phones.	6 Marks	L1	CO3	PO1
		(OR)				
6.	a)	Explain in ken on Registry settings for mobile devices.	6 Marks	L1	CO3	PO1
	b)	List and explain Security implications of mobile devices for organizations.	6 Marks	L2	CO3	PO2
		UNIT-IV				
7.	a)	List and explain various types of Keyloggers in cybercrime.	6 Marks	L1	CO2	PO1
	b)	Discuss in detail about SQL Injection and Buffer Overflow.	6 Marks	L1	CO2	PO2
		(OR)				
8.	a)	List and explain various tools that are used to find the common vulnerabilities in a cybercrime.	6 Marks	L2	CO2	PO5
	b)	Explain in detail about attacks on wireless networks.	6 Marks	L1	CO2	PO1
		UNIT-V				
9.	a)	Explain in keen on smart phone forensics and device seizure.	6 Marks	L1	CO4	PO6
	b)	Discuss in detail about Digital Forensics Lifecycle.	6 Marks	L1	CO4	PO6
		(OR)				
10.	a)	Explain in your own way on the case study of Charity scams.	6 Marks	L3	CO5	PO8
	b)	Illustrate the concept of how official website of Maharashtra government was hacked.	6 Marks	L3	CO5	PO6

CODE No.: 19BT51041 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

PLC AND SCADA

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the main function of each of the following major components of a PLC: i) Processor module (CPU) ii) I/O modules iii) Programming device	6 Marks	L3	CO1	PO1
	b)	Compare Ladder logic diagram and relay logic diagram with examples.	6 Marks	L3	CO1	PO1
		(OR)				
2.	a)	List the advantages, disadvantages and applications of PLC.	6 Marks	L3	CO1	PO1
	b)	Outline the operational procedures used in PLC.	6 Marks	L3	CO1	PO1
		UNIT-II				
3.		A temperature control system consists of four thermostats controlling three heating units. The thermostat contacts are set to close at 50°, 60°, 70°, and 80°F, respectively. The PLC ladder logic program is to be designed so that at a temperature below 50°F, three heaters are to be ON. From 50° to 60°F, two heaters are to be ON. For 60° to 70°F, one heater is to be ON. Above 80°F, there is a safety shutoff for all three heaters in case one stays on because of a malfunction. A master switch is to be used to turn the system ON and OFF. Prepare a typical PLC program for this control process.	12 Marks	L3	CO2	PO3
		(OR)				
4.	a)	Implement the following logic gates using PLC ladder program. i) NAND. ii) Ex-OR. iii) Ex-NOR. iv) AND. v) NOR. vi) OR.	6 Marks	L3	CO2	PO3
	b)	Design a PLC program and prepare a typical I/O connection diagram and ladder logic program for the following counter specifications. i) Counts the number of times a push button is closed. ii) Decrements the accumulated value of the counter each time a second push button is closed.	6 Marks	L3	CO2	PO3
		UNIT-III				
5.	a)	Illustrate the operation of Master control relay in PLC with an example.	6 Marks	L2	CO1	PO1
	b)	Apply not –equal- to COMPARE function, the output is to be on except when an input count is exactly 90.	6 Marks	L3	CO2	PO3
		(OR)				

6.	a)	Outline the following instructions of PLC in detail. i) SKIP. ii) Matrix functions. iii) Jump functions.	6 Marks	L3	CO1	PO1
	b)	Explain how three axis robot control is performed using PLC.	6 Marks	L3	CO1	PO1

UNIT-IV

7.		An RTU can gather data in the form of a discrete switch position. This is used for alarm and status monitoring. What three other forms of field data can be an RTU gather? Describe in detail.	12 Marks	L3	CO3	PO3

(OR)

8.	a)	Explain the SCADA system architecture in detail.	6 Marks	L2	CO3	PO3
	b)	Describe about Master terminal units of SCADA system.	6 Marks	L2	CO3	PO3

UNIT-V

9.		Explain about configuration of I/O server and any two HMI applications.	12 Marks	L3	CO3	PO3

(OR)

10.		Design of water treatment plant SCADA system using system graphic displays.	12 Marks	L3	CO3	PO3

CODE No.: 19BT51505 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

SOFTWARE TESTING

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Describe the evolution of software testing.	6 Marks	L1	CO1	PO1
	b)	Compare and contrast static and dynamic testing.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Discuss the myths and facts of testing.	6 Marks	L4	CO1	PO2
	b)	Explain software testing life cycle.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Explain the different testing techniques.	6 Marks	L2	CO2	PO1
	b)	Write about basis path testing.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Compare state table based testing and decision based testing.	6 Marks	L2	CO2	PO1
	b)	Discuss about graph matrices.	6 Marks	L4	CO2	PO2
		UNIT-III				
5.	a)	Write the steps to prepare test policy.	6 Marks	L2	CO3	PO2
	b)	List the standards for building test data.	6 Marks	L1	CO3	PO1
		(OR)				
6.	a)	Write the template for test plan.	6 Marks	L2	CO3	PO2
	b)	How to monitor the test process.	6 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	Justify “Regression Testing Produces Quality Software”.	6 Marks	L4	CO4	PO1
	b)	Write about Progressive testing.	6 Marks	L2	CO4	PO2
		(OR)				
8.	a)	What are the techniques of regression testing?	6 Marks	L3	CO4	PO1
	b)	Discuss the classification of software metrics.	6 Marks	L2	CO4	PO2
		UNIT-V				
9.	a)	Explain the structure of testing group.	6 Marks	L3	CO5	PO2
	b)	Highlight the need for automation.	6 Marks	L2	CO5	PO1
		(OR)				
10.	a)	List out the different test specifications.	6 Marks	L2	CO6	PO1
	b)	Case study on Income Tax Calculator.	6 Marks	L4	CO6	PO2

CODE No.: 19BT60101 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

STEEL STRUCTURES

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

	UNIT-I				
1.	Design a web-angle connection for a beam MB350 @ 52.4 kg/m which transfers a factored end shear of 200 kN to the flange of the column HB300 @ 63 kg/m. Use M20 bolts of product grade C and property class 5.6.	12 Marks	L6	CO1	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10
	(OR)				
2.	A beam HB 300 transfers an end factored shear of 300 kN and a factored end moment of 120 kNm to the flange of a HB 400 column. Design the welded connection.	12 Marks	L6	CO1	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10
	UNIT-II				
3.	A roof of a hall measuring 8m x 12m consists of 100mm thick R.C slab supported on steel I-beam spaced 3m apart. The finishing load may be taken as 1.5 kN/m² and live load as 1.5 kN/m². Design the steel beam.	12 Marks	L6	CO2	PO1 PO2 PO3 PO4 PO5 PO6 PO8
	(OR)				
4.	Design a beam of 5m effective span, carrying a uniform load of 20kN/m, if the compression flange is laterally unsupported. Assume f_y = 250 MPa.	12 Marks	L6	CO2	PO1 PO2 PO3 PO4 PO5 PO6 PO8
	UNIT-III				
5.	Design a single angle section for a tension member of a roof truss to carry a factored tensile force of 225kN. The member is subjected to the possible reversal of stress due to the action of wind. The effective length of the member is 3m. Use 20mm shop bolts of grade 4.6 for the connection.	12 Marks	L6	CO3	PO1 PO2 PO6 PO8 PO10

(OR)

6.	Design a single angle strut connected to the gusset plate to carry 180 kN factored load. The length of the strut between centre to centre connection is 3m.	12 Marks	L6	CO3	PO1 PO2 PO6 PO8 PO10

UNIT-IV

7.	Design a laced column with two channels back to back of length 8m to carry an axial factored load of 1200 kN. The column may be assumed to have restrained in position but not in direction at both ends (hinged ends).	12 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10

(OR)

8.	A steel column ISHB 250 @ 537 N/m supports a total factored load of 1000 kN. Design a slab base for the column. The column is supported on a pedestal made of M20 concrete.	12 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10

UNIT-V

9.	Explain the following terms in accordance to IS: 875 (Part III) i) Basic wind speed ii) Design wind speed iii) Wind pressure iv) Risk coefficient v) Terrain, Height and Structure size factor vi) Wind load.	12 Marks	L2	CO5	PO1 PO8

(OR)

10.	A roof truss shed is to be built in Lucknow for an industry. The size of shed is 24m x 40m. The height of building is 12m at the eves. Determine the basic wind pressure.	12 Marks	L4	CO5	PO1 PO2 PO4 PO6 PO8

CODE No.: 19BT60104 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

AIR AND NOISE POLLUTION AND CONTROL

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Define air pollution. Explain primary and secondary air pollutants.	6 Marks	L2	CO1	PO1 PO10
	b)	Classify the impacts of noise pollution on humans.	6 Marks	L2	CO1	PO1 PO2 PO4 PO5 PO6 PO7 PO10
		(OR)				
2.	a)	With a neat sketch, explain the Plume behavior for the different atmospheric conditions.	6 Marks	L2	CO1	PO1 PO4 PO6 PO7 PO10
	b)	Briefly explain the control aspects of noise pollutants.	6 Marks	L2	CO1	PO1,PO2 PO4,PO5 PO6 PO7 PO10
		UNIT-II				
3.		Discuss in detail about the effects of air pollution on human health and plants.	12 Marks	L2	CO2	PO1 PO2 PO6 PO7 PO10
		(OR)				
4.	a)	Differentiate between green house effect and acid rain. Explain in detail about them with a neat sketch.	6 Marks	L4	CO2	PO1 PO2 PO6 PO7 PO10
	b)	What is power and intensity in noise pollution? Also write the significance of noise pollution.	6 Marks	L4	CO2	PO1 PO2 PO6 PO7 PO10
		UNIT-III				
5.		What is meant by air sampling? Classify the various sampling methods and explain any two briefly.	12 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO6 PO7 PO8 PO10
		(OR)				
6.	a)	List the various stack sampling techniques and explain briefly.	6 Marks	L2	CO3	PO1 PO4 PO5 PO7 PO10
	b)	Explain in detail the outdoor noise propagation and indoor noise propagation in relation with noise pollution and control.	6 Marks	L4	CO3	PO1 PO4 PO5 PO7 PO10
		UNIT-IV				
7.	a)	Explain the working principle of settling chamber to control particulate air pollutants.	6 Marks	L2	CO4	PO1 PO2 PO4 PO5 PO6 PO7 PO10
	b)	Briefly discuss the use of catalytic converters in vehicular pollution control.	6 Marks	L4	CO4	PO1 PO2 PO4 PO5 PO6 PO7 PO10

(OR)

8.	a)	With the neat sketch explain the working principle of Cyclone separator.	6 Marks	L2	CO4	PO1 PO2 PO4 PO5 PO6 PO7 PO10
	b)	Explain the principle, design and working of catalytic converters?	6 Marks	L4	CO4	PO1 PO2 PO4 PO5 PO6 PO7 PO10

UNIT-V

9.	a)	Discuss the impact of mining activities on air quality in nearby environment. How to overcome the impacts?	6 Marks	L4	CO5	PO1 PO2 PO4 PO6
	b)	Explain the sources and different methods to control the noise pollution.	6 Marks	L2	CO5	PO1 PO2 PO4 PO6
		(OR)				
10.	a)	What is the noise standard for different zones during day time and night time?	6 Marks	L2	CO5	PO1 PO2 PO4 PO6
	b)	Write a note on subsidence inversion and double inversion in relation to atmospheric stability.	6 Marks	L2	CO5	PO1 PO2 PO4 PO6

CODE No.: 19BT60106 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

GROUND IMPROVEMENT TECHNIQUES

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the conditions that necessitate ground improvement.	6 Marks	L2	CO1	PO1
	b)	What other design or construction alternatives would be considered besides soil improvement such as compaction in order to overcome a difficult foundation problem? Explain in detail.	6 Marks	L2	CO1	PO1 PO5 PO7
		(OR)				
2.	a)	Explain the need and suitability of the ground improvement technique for different types of soils.	6 Marks	L2	CO1	PO1
	b)	Explain the role of ground improvement in foundation engineering.	6 Marks	L2	CO1	PO1 PO7

UNIT-II

3.	a)	What is dewatering? List out various methods. Explain its importance in Civil engineering works.	6 Marks	L2	CO2	**PO1 PO5 PO6 PO7 PO8 PO10**
	b)	What are the uses of drainage of soils?	6 Marks	L2	CO2	PO1 PO5
		(OR)				
4.	a)	Explain the working of a single-stage well point system with neat sketch. What are its limitations?	6 Marks	L2	CO2	PO1 PO5
	b)	Elaborate the criterion for the selection of filling material.	6 Marks	L4	CO2	**PO1 PO5 PO10**

UNIT-III

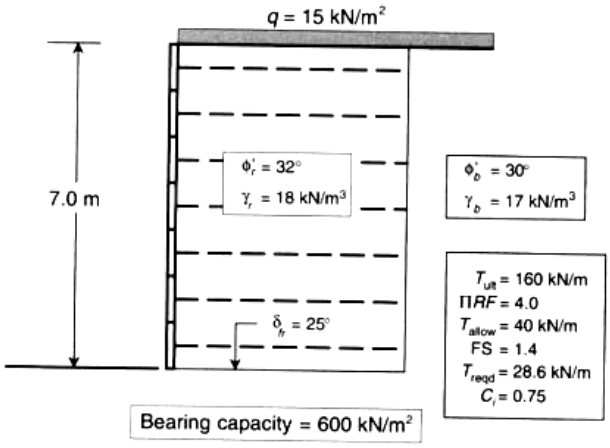
5.	a)	Describe the deep dynamic compaction in granular soil with the factors influencing.	6 Marks	L2	CO3	PO1 PO5 PO10
	b)	Explain the terms Vibro-Compaction and Vibro-Replacement, highlighting the typical characteristics and the relative effectiveness of both the terms.	6 Marks	L4	CO3	PO1 PO5 PO10
		(OR)				
6.	a)	Explain the blasting technique with a neat sketch to densify cohesionless soil beds.	6 Marks	L2	CO3	PO1 PO2 PO5 PO6 PO7 PO8 PO10
	b)	Evaluate the technique of vibro-floatation.	6 Marks	L4	CO3	PO1 PO5 PO10

UNIT-IV

7.	a)	What is soil stabilization? And what are the different methods of soil stabilization? Explain.	6 Marks	L2	CO4	PO1 PO2 PO5 PO7
	b)	List out four physical characteristics of grouting liquid relevant to engineering applications.	6 Marks	L4	CO4	PO1 PO5
		(OR)				
8.	a)	Discuss the effectiveness of lime stabilization with respect to different type of soils.	6 Marks	L2	CO4	PO1 PO2 PO5 PO7
	b)	Differentiate between the compaction grouting and displacement grouting.	6 Marks	L4	CO4	PO1 PO5

UNIT-V

9.	a)	What are Geogrids as compared to Geotextiles? What are the advantages of Geogrids over Geotextiles?	6 Marks	L2	CO5	PO1 PO5
	b)	Design a 7-meter-high geogrid-reinforced wall where the reinforcement must be at 1,0 meter spacing, since the wall facing is of the articulated precast concrete type of this same dimension. The coverage ratio is 0.8. The length to height ratio of on the reinforced wall not less than 0.7. Additional details of the problem, including soil and geogrid data are shown in the diagram below.	6 Marks	L6	CO5	PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO10



(OR)

10.	a)	Explain the with neat sketches the various functions of geotextiles.	6 Marks	L2	CO5	PO1 PO2 PO5 PO7 PO8
	b)	Identify various failure modes of geosynthetic-reinforced soil retaining walls? Explain them briefly.	6 Marks	L6	CO5	PO1 PO5

❀ ❀ ❀

CODE No.: 19BT60109 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

ADVANCED REINFORCED CEMENT CONCRETE STRUCTURES

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	Two columns C_1 and C_2 are the boundary columns of a building of size 6m 16m in city area. Size of the columns is 230mm x 500mm spaced at 6m out to out (i.e., 5.77 m c/c). Column C_1 and C_2 carry 500 kN and 600 kN characteristic loads respectively. Design a strap footing for columns C_1 and C_2. A.B.P. on soil is 200 kN/m². The materials are M 20 grade concrete and HYSD reinforcement of grade Fe 415.	12 Marks	L6	CO1	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10
	(OR)				
2.	An R.C.C. column of a multi-storeyed building transfers following service loads on the pile cap of a pile foundation. Propose the arrangement of piles and determine the loads in the piles. The service loads are: P= 1600 kN M = 400 kNm about major axis Column size = 400mm x 600mm.	12 Marks	L5	CO1	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10

UNIT-II

3.	A flat slab is supported on 600 mm dia circular columns spaced 8 m x 6 m apart in both directions. The column head has a diameter of 120 cm. The live load on the flat slab is 5 kN/m² Determine the moments in the flat slab along its 8m span.	12 Marks	L5	CO2	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10
	(OR)				
4.	Design the exterior panel of a flat slab floor system for a warehouse 18 m x 18 m divided into panels of 6 m x 6 m by columns. Adopt a live load of 5 kN/m² with columns of size 400 mm diameters. Height of floor = 3 m. Adopt M20 grade concrete and Fe415 HYSD bars. The design should confirm to the specifications of IS: 456-2000 code.	12 Marks	L6	CO2	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10

UNIT-III

5.	Design a cantilever retaining wall to support a bank of earth 5 m high above the earth level at the toe of the wall. A building is to be built on the backfill. Assume that a 3m surcharge will approximate the lateral earth pressure effect. Given: earth density = 17 kN/m³, angle of internal friction (repose) = 35° coefficient of friction between concrete and soil 0.45; bearing capacity = 150 kN/m². Use M15 mix and Fe 415 grade steel.	12 Marks	L6	CO3	PO1 PO2 PO3 PO4 PO5 PO6 PO8
	(OR)				
6.	A counterfort retaining wall has a height of retaining earth of 6 m. The top surface is horizontal behind the wall. The soil behind the wall is a well drained medium dense sand with following properties: Unit weight 16.2 kN/m³ Angle of internal friction = 30°. The material under the wall base is the same as above with allowable bearing pressure of 150 kN/m². The coefficient of friction between the base and the soil is 0.6 Design the wall using M 20 grade concrete and HYSD reinforcement of grade Fe 415.	12 Marks	L6	CO3	PO1 PO2 PO3 PO4 PO5 PO6 PO8

UNIT-IV

7.	A rectangular R.C. water tank with an open top is required to store 250,000 litres of water. The inside dimensions of tank may be taken as 16 m x 18 m. The tank rests on walls on all the four sides. Design the side walls of the tank using M20 concrete and Grade-I steel.	12 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10
	(OR)				
8.	Design a circular tank with a flexible base for capacity of 400,000 litres. The depth of water is to be 4 m. Free board = 200 mm. Use M-25 grade concrete and Grade-I mild steel. Permissible direct tensile stress in concrete = 1.4 N/mm². Permissible stress in steel in direct tension = 120 N/mm². Sketch the details of reinforcement in tank walls.	12 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10

UNIT-V

9.	A concrete chimney of height 80 m with the external diameter of the shaft being 3.6 m at top and 5 m at bottom is required in a place where the wind intensity is 1.5 kN/m².thickness of fire brick lining = 12 cm. temperature difference between inside and outside shaft is 85 degree Celsius. Permissible bearing pressure on soil at the site = 165 kN/m². By adopting M15 grade concrete and Fe415 steel, design the base section of chimney.	12 Marks	L6	CO5	PO2 PO3 PO4 PO5 PO6 PO8 PO10
	(OR)				
10.	Explain the design steps for silos as codal guidelines.	12 Marks	L2	CO5	PO1 PO4 PO5 PO6 PO8

❀ ❀ ❀

CODE No.: 19BT60113 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

REHABILITATION AND RETROFITTING OF STRUCTURES

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	List out the facets of maintenance.	6 Marks	L1	CO1	PO1 PO2
	b)	Describe about the inspection to be carried out during and after the construction of structure.	6 Marks	L2	CO1	PO1 PO2 PO5
		(OR)				
2.	a)	Identify the various steps involved in the systematic approach of investigations and the factors to be ascertained.	6 Marks	L3	CO1	PO1 PO6 PO7
	b)	As a site engineer examine what are the factors you would check during the day of concreting to assure quality in construction.	6 Marks	L4	CO1	PO1 PO5
		UNIT-II				
3.	a)	Tabulate the cover to be provided for various exposure conditions to concrete as per IS codes.	6 Marks	L1	CO2	PO1 PO2
	b)	Define durability and name two tests to assess durability of concrete.	6 Marks	L5	CO2	PO1 PO6 PO7
		(OR)				
4.	a)	How does the properties of fine aggregate, coarse aggregate and cement affect the relationship of water demand on slump, and the water-cement ratio and compressive strength?	6 Marks	L1	CO2	PO1 PO6 PO8
	b)	Elaborately explain about the effect of temperature on concrete.	6 Marks	L4	CO2	PO1 PO6 PO8 PO10
		UNIT-III				
5.	a)	What is mean by Geopolymer concrete? List the materials used for making geopolymer concrete.	6 Marks	L2	CO3	PO1 PO4 PO6 PO8
	b)	What are the applications of special concretes?	6 Marks	L4	CO3	PO1 PO5 PO7
		(OR)				
6.	a)	Explain the following: i) High strength concrete. ii) Vacuum concrete.	6 Marks	L2	CO3	PO1 PO2 PO4
	b)	Describe in detail about the reactive powder concrete.	6 Marks	L2	CO3	PO1 PO4 PO6

UNIT-IV

7.	a)	What is the fundamental principle behind rebound hammer test?	6 Marks	L1	CO4	PO1 PO6 PO7 PO8
	b)	Write note on jacketing.	6 Marks	L6	CO4	PO4 PO5 PO6
		(OR)				
8.	a)	Explain in detail the types of corrosion protection methods.	6 Marks	L4	CO4	PO1 PO5 PO7
	b)	Summarize the process of epoxy injection. Also explain routing and sealing with sketches.	6 Marks	L6	CO4	PO6 PO7 PO12

UNIT-V

9.	a)	List out types of demolition techniques.	6 Marks	L1	CO5	PO7 PO8 PO12
	b)	What are the effects of fire on concrete?	6 Marks	L2	CO5	PO1 PO2 PO4
		(OR)				
10.	a)	Demonstrate crack repair by routing and sealing with neat sketch.	6 Marks	L4	CO5	PO1 PO2 PO5
	b)	Differentiate between dormant cracks and active cracks.	6 Marks	L4	CO5	PO1 PO4 PO5

CODE No.: 19BT60114 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

SOLID AND HAZARDOUS WASTE MANAGEMENT

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss the legislation for disposal of municipal solid waste.	6 Marks	L1	CO1	PO1 PO6 PO8 PO12
	b)	Classify the solid waste based on its characteristics and explain them in brief.	6 Marks	L1	CO1	PO1 PO2
		(OR)				
2.	a)	List and brief the properties of municipal solid waste. How are these properties important in the management of municipal solid waste?	6 Marks	L1	CO1	PO1 PO4 PO5 PO12
	b)	What do you understand about the sources of municipal solid waste?	6 Marks	L1	CO1	PO1 PO2

UNIT-II

3.	a)	List and discuss about the various factors influencing equipment selection for on-site processing of solid waste.	6 Marks	L1	CO2	PO1 PO2 PO5 PO6
	b)	Enumerate the guiding principles of municipal solid waste in India.	6 Marks	L3	CO2	PO1 PO6 PO8
		(OR)				
4.	a)	Explain Various storage and processing Options under Indian conditions.	6 Marks	L2	CO2	PO1 PO2 PO6
	b)	Explain various Public health and economic aspects of storage.	6 Marks	L2	CO2	PO1 PO8

UNIT-III

5.	a)	Describe various types of vehicles used for transport of municipal solid waste.	6 Marks	L3	CO3	PO1
	b)	List the important aspects to be considered in selecting the crew size and route for efficient collection of solid waste in your city.	6 Marks	L2	CO3	PO1 PO2 PO4 PO6 PO7 PO11

(OR)

6.	a)	Explain various methods of solid waste collection.	6 Marks	L2	CO3	PO1
	b)	Mention various Guidelines for selection of Transfer stations.	6 Marks	L2	CO3	PO1 PO2 PO11
		UNIT-IV				
7.	a)	Analyze various off-site processing techniques for solid wastes which are well suited under Indian conditions.	6 Marks	L4	CO4	PO1 PO2 PO4 PO5 PO6 PO7
	b)	List and discuss the factors to be considered while selecting a site for sanitary land fill.	6 Marks	L3	CO5	PO1 PO2 PO4 PO6 PO7
		(OR)				
8.	a)	Distinguish between incineration and pyrolysis. As a solid waste management expert, which method do you prefer for organic wastes?	6 Marks	L2	CO4	PO1 PO2 PO7
	b)	Emphasize leachate and its control in a landfill of municipal solid waste.	6 Marks	L4	CO5	PO1 PO7
		UNIT-V				
9.	a)	Relate the improper disposal of e-waste on human health and environment.	6 Marks	L2	CO6	PO1 PO2 PO5 PO7
	b)	Discuss the environmental legislations to be followed in disposal of hazardous waste.	6 Marks	L2	CO6	PO1 PO6 PO7 PO8
		(OR)				
10.	a)	List five Hazardous Waste Treatment Operations and Processes.	6 Marks	L2	CO6	PO1 PO7
	b)	Emphasize types of biomedical waste, hazards associated with biomedical waste and their disposal methods.	6 Marks	L3	CO6	PO1 PO6

CODE No.: 19BT60117 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

HIGHWAY CONSTRUCTION AND MAINTENANCE

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Discuss about WBM road construction as per IRC.	6 Marks	L2	CO1	PO1 PO5 PO8
	b)	Discuss about cement concrete pavement construction.	6 Marks	L2	CO1	PO1 PO5 PO8
		(OR)				
2.		Classify the different types of joints in cc pavements. Discuss briefly with neat sketches.	12 Marks	L4	CO1	PO1 PO2 PO10
		UNIT-II				
3.		Compare and contrast different types of soil stabilization techniques suitable for road construction.	12 Marks	L4	CO2	PO1 PO2 PO5 PO8
		(OR)				
4.	a)	Write a short note on latest developments in stabilization methods.	6 Marks	L3	CO2	PO1 PO12
	b)	Explain how optimum content of lime is chosen in lime soil stabilization.	6 Marks	L3	CO2	PO1 PO2 PO5 PO8
		UNIT-III				
5.	a)	Explain which type of road construction method is suitable for water logged areas and why.	6 Marks	L3	CO3	PO1 PO5
	b)	Explain the Importance of highway drainage	6 Marks	L3	CO3	PO1 PO5
		(OR)				
6.		The maximum quantity of water expected in one of the open longitudinal drains on clayey soil is 1.3 m^3 /sec. Design the cross section and longitudinal slope of trapezoidal drain assuming the bottom width of the trapezoidal section to be 0.75 m and cross slope to be 1.0 vertical to 1.5 horizontal. The allowable velocity of flow in the drain is 0.88 m/sec and Manning's roughness coefficient is 0.02.	12 Marks	L6	CO3	PO1 PO2 PO3 PO4
		UNIT-IV				
7.	a)	Write in detail about compacting equipment for bituminous mixes.	6 Marks	L3	CO4	PO1 PO5
	b)	Discuss about hot mix plants for production of bituminous mixes	6 Marks	L2	CO4	PO1 PO5

(OR)

8.	a)	Discuss about piles and pile driving equipments in detail.	6 Marks	L2	CO4	PO1 PO5
	b)	Discuss about Air compressors and pumps used in construction.	6 Marks	L2	CO4	PO1 PO5

UNIT-V

9.	a)	Enlist the various flexible pavement failures.	6 Marks	L1	CO5	PO1 PO6
	b)	Classify pavements overlays.	6 Marks	L2	CO5	PO1 PO6

(OR)

10.		Define pavement evaluation and explain different pavement evaluation techniques.	12 Marks	L3	CO5	PO1 PO6

CODE No.: 19BT60118 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

INDUSTRIAL WASTEWATER TREATMENT

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain in detail about Industrial sources of wastewater and characteristics.	6 Marks	L1	CO1	PO1 PO2 PO6
	b)	What are the differences between Industrial and municipal waste water?	6 Marks	L3	CO1	PO1 PO7
		(OR)				
2.	a)	What is meant by self-purification of a stream?	6 Marks	L4	CO1	PO1 PO2 PO6 PO7
	b)	Explain the sources of wastewater and characteristics.	6 Marks	L3	CO1	PO1 PO2 PO8 PO10

UNIT-II

3.	a)	Distinguish between preliminary and primary treatments operations. Illustrate with a flow diagram.	6 Marks	L2	CO2	PO7 PO8 PO10
	b)	Sketch and describe the construction and working of grit chambers.	6 Marks	L3	CO2	PO1 PO2 PO3 PO4
		(OR)				
4.	a)	Explain in detail about Microbiological metabolism.	6 Marks	L4	CO2	PO5 PO7 PO10
	b)	Design a complete mixed activated sludge process aeration tank for treatment of 7 MLD sewage having BOD concentration of 380 mg/L. The treated sewage should have BOD less than or equal to 25 mg/L. Consider the following data for design of aeration tank: MLSS in the aeration tank = 4000 mg/l. Return sludge SS concentration = 10000 mg/l. Mean cell residence time adopted in design is 10 days, Yield coefficient = 0.65, and Decay coefficient = 0.23 d^{-1}. Assume that the BOD removed is 35% in the primary treatment.	6 Marks	L6	CO2	PO1 PO2 PO3

UNIT-III

5.	a)	Differentiate the Nitrification and Denitrification.	6 Marks	L4	CO3	PO1 PO2 PO4

	b)	Discuss the problems arising when industrial waste waters are discharged into rivers.	6 Marks	L2	CO3	PO5 PO6 PO7 PO10
		(OR)				
6.	a)	Explain in detail about different types of toxic chemicals.	6 Marks	L1	CO3	PO1 PO2
	b)	Explain in detail about Phosphate removal by activated sludge process.	6 Marks	L4	CO3	PO5 PO6 PO7
		UNIT-IV				
7.	a)	What are the major chemical compositions of waste water obtained from dairy units?	6 Marks	L2	CO3	PO1 PO2 PO10 PO12
	b)	What are the possible hazardous substances that can be present in waste water obtained from tanneries and distilleries?	6 Marks	L2	CO3	PO1 PO2 PO5 PO12
		(OR)				
8.	a)	A combined effluent from tannery industry has the following characteristics. pH = 8.5, Temperature = 25°C, Turbidity = 200 NTU, BOD = 1000 mg/L, COD = 2000 mg/L, Total Dissolved Solids = 3200 mg/L and Chromium (VI) = 4 mg/L. Analyse and suggest a suitable treatment method by interpreting the above data and draw a suggested treatment flow sheet diagram for the same.	6 Marks	L4	CO4	PO1 PO2 PO4 PO10
	b)	Explain the conventional treatment of dairy wastewater with flow sheet of a typical diary effluent treatment plant.	6 Marks	L2	CO4	PO1 PO2 PO5 PO6 PO7
		UNIT-V				
9.	a)	Explain the 4R principle of waste management with latest technologies.	6 Marks	L4	CO5	PO1 PO2 PO5 PO7 PO12
	b)	Explain about flow measurement in waste water minimization.	6 Marks	L2	CO5	PO1 PO2 PO4
		(OR)				
10.	a)	What are the limitations of waste water minimization?	6 Marks	L3	CO5	PO1 PO2 PO6
	b)	Explain in detail about water conservation.	6 Marks	L3	CO5	PO1 PO2 PO7 PO10

❀ ❀ ❀

CODE No.: 19BT60119 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

INFRASTRUCTURE DEVELOPMENT AND MANAGEMENT

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Briefly explain the reasons for rise of public sector and government involvement in infrastructural activities.	6 Marks	L4	CO1	PO1 PO2 PO6
	b)	Discuss about the changed socio-economic scenario and current infrastructure problems in India.	6 Marks	L4	CO1	PO1 PO2 PO6 PO11
		(OR)				
2.	a)	Explain briefly the impact of Standard of living and environment.	6 Marks	L4	CO1	PO1 PO2 PO6
	b)	Explain Impact of Infrastructure development on economic development.	6 Marks	L4	CO1	PO1 PO2 PO6 PO7

UNIT-II

3.	a)	Discuss in detail about public private partnership contracts. Explain its role in infrastructure development.	6 Marks	L4	CO2	PO1 PO2 PO6 PO8 PO11
	b)	Write a short note on turnkey contracts.	6 Marks	L4	CO2	PO1 PO2 PO8 PO11
		(OR)				
4.	a)	Explain different strategies of power generation and factors affecting power generation.	6 Marks	L4	CO2	PO1 PO2 PO6 PO7
	b)	What is the current power scenario in India?	6 Marks	L4	CO2	PO1 PO2 PO6 PO7

UNIT-III

5.	a)	Write a brief note on current public policies on transportation, power and telecom sectors.	6 Marks	L4	CO3	PO1 PO2 PO4 PO7
	b)	Explain the legal framework for regulating private participation in roads and highways.	6 Marks	L4	CO3	PO1 PO2 PO8
		(OR)				
6.	a)	Explain the different 20-year plan for the development of highways in India.	6 Marks	L4	CO3	PO1 PO2 PO6
	b)	Discuss in detail about Roads and highways, Ports and Airports.	6 Marks	L4	CO3	PO1 PO2 PO4 PO7

UNIT-IV

7.		Discuss the technological and methodological demands on construction management in infrastructure development projects.	12 Marks	L4	CO4	PO1 PO2 PO4 PO6
		(OR)				
8.	a)	Explain briefly about the component of Highway, Ports and aviation.	6 Marks	L4	CO4	PO1 PO2 PO4
	b)	Explain the construction component of oil and gas sector.	6 Marks	L4	CO4	PO1 PO2

UNIT-V

9.	a)	Explain the toll collection strategy in India. Differentiate between shadow tolling and direct tolling.	6 Marks	L4	CO5	PO1 PO2 PO5 PO8 PO11
	b)	Write a brief note on MRTS, LRT and Multi model transport system.	6 Marks	L4	CO5	PO1 PO2 PO4 PO5 PO6 PO7
		(OR)				
10.		Write a brief note on scope and role of Terminal management, ATC and Requisites of domestic & International airports and cargo & military airports.	12 Marks	L4	CO5	PO1 PO2 PO5 PO8 PO11

CODE No.: 19BT60123 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

FIRE ENGINEERING

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Briefly explain the Different types of fire speed.	6 Marks	L1	CO1	PO1 PO2
	b)	Compare the complete Combustion and in complete combustion.	6 Marks	L2	CO1	PO1 PO7
		(OR)				
2.		Differentiate Unconfined vapour cloud explosion and Boiling liquid expanding vapour explosion.	12 Marks	L4	CO1	PO1 PO2 PO6 PO7

UNIT-II

3.	a)	Explain in detail about the fire triangle measure in building.	6 Marks	L4	CO2	PO1 PO2
	b)	What are the strategies to be adopted for fire prevention?	6 Marks	L2	CO2	PO1
		(OR)				
4.		List the fire rescue operations and explain in detail.	12 Marks	L6	CO2	PO1 PO2 PO7

UNIT-III

5.		Discuss in detail the design features, installation, maintenance and operation of explosion detection and control systems.	12 Marks	L4	CO3	PO1 PO2 PO5 PO8
		(OR)				
6.	a)	Illustrate the "Deluge and Emulsifier" System.	6 Marks	L2	CO3	PO1 PO2
	b)	Explain the method of Water Sprinkler system.	6 Marks	L4	CO3	PO1 PO5

UNIT-IV

7.	a)	Discuss the Necessity of fire certificates.	6 Marks	L2	CO4	PO1 PO2
	b)	As an Engineer how would you describe safety as an essential parameter in designing residential building?	6 Marks	L4	CO4	PO1 PO2 PO3
		(OR)				
8.		Simplify the concept of egress design for residential building.	12 Marks	L4	CO4	PO1 PO2 PO4

UNIT-V

9.	a)	Compare the detonation and blast waves.	6 Marks	L2	CO5	PO1 PO2
	b)	Give the details of plant for generation of inert gas.	6 Marks	L2	CO5	PO1 PO7
		(OR)				
10.		As an engineer how would you describe explosion protection systems in industry and residential building.	12 Marks	L4	CO5	PO1 PO2 PO6 PO7 PO10 PO11

CODE No.: 19BT60124 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

INTELLIGENT TRANSPORTATION SYSTEMS

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define ITS and list out its objectives.	6 Marks	L2	CO1	PO1 PO5 PO6 PO7
	b)	Explain the historical background of ITS and list the benefits.	6 Marks	L2	CO1	PO1 PO5 PO6 PO7
		(OR)				
2.	a)	Explain the following terms: i) Automated Vehicle Location (AVL) ii) Automated Vehicle Identification (AVI)	6 Marks	L2	CO1	PO1 PO5 PO6 PO12
	b)	Discuss about detectors for data collection.	6 Marks	L4	CO1	PO1 PO2 PO5 PO8 PO10

UNIT-II

3.	a)	What is the importance of telecommunications in ITS system?	6 Marks	L2	CO2	PO1 PO5 PO6 PO8 PO10
	b)	Discuss how information management system helps in traffic management.	6 Marks	L4	CO2	PO1 PO2 PO6 PO7
		(OR)				
4.	a)	ITS approach through telecommunications is effective in solving transportation problems? Justify.	6 Marks	L4	CO2	PO1 PO2 PO4 PO5 PO6 PO8
	b)	Explain about road side communication system in effective traffic management.	6 Marks	L2	CO2	PO1 PO6

		UNIT-III				
5.	a)	Compare and Contrast Advanced Traffic Management Systems (ATMS) and Advanced Traveller Information Systems (ATIS).	6 Marks	L4	CO3	PO1 PO2 PO5 PO6
	b)	Discuss briefly about Commercial Vehicle Operations (CVO).	6 Marks	L2	CO3	PO1 PO5
		(OR)				
6.	a)	Discuss briefly about Advanced Vehicle Control Systems (AVCS).	6 Marks	L2	CO3	PO1 PO5
	b)	List out various advantages of Advanced Public Transportation Systems (APTS) and Advanced Rural Transportation Systems (ARTS).	6 Marks	L4	CO3	PO1 PO2 PO6
		UNIT-IV				
7.	a)	Discuss briefly about travel and traffic management.	6 Marks	L2	CO4	PO1 PO6 PO7
	b)	Discuss how effective ITS can be in Public transportation management.	6 Marks	L2	CO4	PO1 PO6 PO7
		(OR)				
8.	a)	Discuss in detail about commercial vehicle operations and emergency management in ITS.	6 Marks	L4	CO4	PO1 PO2 PO5 PO6
	b)	Explain how Advanced vehicle safety systems can be implemented using ITS.	6 Marks	L4	CO4	PO1 PO2 PO5 PO6
		UNIT-V				
9.		List the various challenges involved in the implementation of automated highway systems. Discuss in detail.	12 Marks	L4	CO5	PO1 PO2 PO6
		(OR)				
10.	a)	Enumerate different ITS system components throughout the world.	6 Marks	L2	CO5	PO1 PO5 PO6
	b)	Explain how ITS is implemented in developing countries.	6 Marks	L2	CO5	PO1 PO5 PO6

CODE No.: 19BT60125 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

SMART MATERIALS AND STRUCTURES

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Define smart materials and smart structures discuss on types of smart structures.	12 Marks	L1	CO1	PO1 PO2 PO4 PO5 PO6 PO7
		(OR)				
2.		Explain the functions of various sensing systems and actuation systems in smart structures.	12 Marks	L4	CO1	PO1 PO2 PO4 PO5 PO6 PO7

UNIT-II

3.	a)	What are the different types of strain gauges in smart structure? Explain any two of them with simple sketches.	6 Marks	L2	CO2	PO1 PO2 PO4 PO5 PO6 PO7
	b)	Brief on the role of: i) Wheatstone bridge. ii) Pressure transducer in smart structure.	6 Marks	L3	CO2	PO1 PO2 PO4 PO5 PO6 PO7
		(OR)				
4.		Explain briefly about strain measuring techniques using electric strain gauges.	12 Marks	L4	CO2	PO1 PO2 PO4 PO5 PO6 PO7

UNIT-III

5.	a)	Explain the phenomenon of piezo electric effect and discuss on its application.	6 Marks	L2	CO3	PO1 PO2 PO4 PO5 PO6 PO7
	b)	Write a brief note on spectroscopes.	6 Marks	L2	CO3	PO1

						PO2 PO4 PO5 PO6 PO7
		(OR)				
6.	a)	Explain how fiber optics used to detect crack in any structures.	6 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO6 PO7
	b)	What are different types of sensors and explain any two of them.	6 Marks	L1	CO3	PO1 PO2 PO4 PO5 PO6 PO7
		UNIT-IV				
7.	a)	Describe the current generation actuator materials and give 2 examples.	6 Marks	L3	CO4	PO1 PO2 PO4 PO5 PO6 PO7
	b)	List and explain the applications of Shape Memory alloys (SMA).	6 Marks	L3	CO4	PO1 PO2 PO4 PO5 PO6 PO7
		(OR)				
8.		What do mean by ER fluid? Explain with examples, the application of ER fluids in different modes. Also state the advantages of ER fluids.	12 Marks	L3	CO4	PO1 PO2 PO4 PO5 PO6 PO7
		UNIT-V				
9.		Write brief technical note on: i) Data acquisition ii) Signal processing	12 Marks	L2	CO5	PO1 PO2 PO4 PO5 PO6 PO7
		(OR)				
10.		Explain: i) Data visualization ii) Data reliability	12 Marks	L2	CO5	PO1 PO2 PO4 PO5 PO6 PO7

CODE No.: 19BT60201 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

POWER ELECTRONICS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

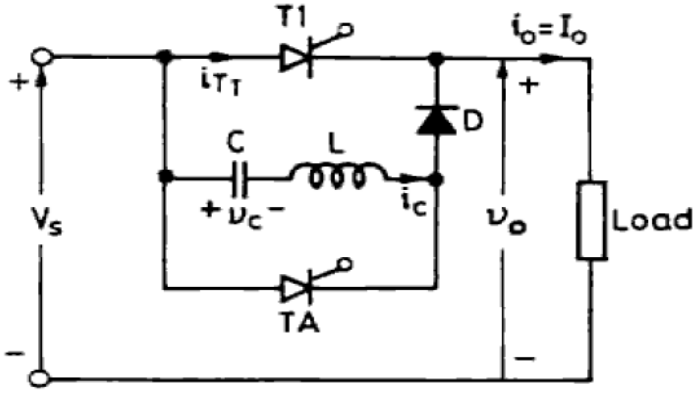
UNIT-I

1.	a)	Briefly explain the two transistor analogy of SCR. Derive the expression for the anode current.	6 Marks	L1	CO1	PO1
	b)	Briefly explain the forward voltage triggering and gate triggering method of an SCR.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Briefly explain the V-I characteristics of MOSFET.	6 Marks	L1	CO1	PO2
	b)	Briefly explain the V-I characteristics of BJT.	6 Marks	L1	CO1	PO7

UNIT-II

3.	a)	Explain the operation of the single phase fully controlled rectifier with RL load for discontinuous mode of operation. Derive the expression for the average, RMS output voltage.	6 Marks	L2	CO1	PO5
	b)	Explain the operation of single phase semi controlled rectifier for RL load. Derive the expression for the average and RMS output voltage.	6 Marks	L2	CO1	PO2
		(OR)				
4.	a)	Explain the operation of three phase fully controlled rectifiers with R load for continuous mode of operation. Derive the expression for the average and RMS output voltage.	6 Marks	L3	CO1	PO3
	b)	A single phase semi converter is operating from a 120V, 50Hz ac supply. The load resistance is 10Ω. If the average output voltage is 25% of the maximum possible output voltage. Calculate the i) firing angle ii) average and RMS output voltage. iii) average and RMS output current.	6 Marks	L3	CO1	PO5

UNIT-III

5.	a)	Define forced commutation. Briefly explain the class-A commutation method.	6 Marks	L3	CO2	PO2
	b)	 The circuit shown in above Fig. is employing resonant-pulse commutation (or class-B commutation) has C = 20μF and	6 Marks	L3	CO2	PO5

		L = 5 μH. Initial voltage across capacitor is Vs= 230 V. For a constant load current of 300 A, calculate i) Conduction time for the auxiliary thyristor. ii) Voltage across the main thyristor when it gets commutated. iii) The circuit turn-off time for the main thyristor.				
		(OR)				
6.	a)	Explain the principle of operation of the step-down chopper. What are the applications of it?	6 Marks	L2	CO2	PO1
	b)	For step up chopper the DC source voltage is 230V, load resistance is 10Ω. Consider a voltage drop of 2V across chopper when it is on. For a duty cycle of 0.4, calculate i) average and rms values of output voltage and ii) chopper efficiency.	6 Marks	L2	CO2	PO2
		UNIT-IV				
7.	a)	Explain the operation of single-phase dual converter in circulating mode of operation for R load.	6 Marks	L3	CO3	PO5
	b)	A single phase AC voltage controller is employed for controlling the power flow from a 230V, 50Hz ac source in to a load consisting of 3Ω and ωL=4Ω. Calculate the control range of the firing angle, maximum value of rms load current, maximum value of load power and power factor.	6 Marks	L3	CO3	PO2
		(OR)				
8.	a)	Explain the principle of operation of single-phase step down cyclo converter for R load. What are the applications of it?	6 Marks	L3	CO3	PO2
	b)	A single-phase step down cyclo converter has input voltage of 230V, 50Hz. The output frequency is 8one third of the input frequency, for a firing angle of 30 degrees. Calculate the rms value of output voltage, rms value of output current, rms current of each converter, rms value of each thyristor current, input power factor.	6 Marks	L3	CO3	PO7
		UNIT-V				
9.	a)	Explain the operation of single-phase full bridge voltage source inverter employing the sinusoidal PWM technique.	6 Marks	L3	CO4	PO2
	b)	Explain the operation of single-phase full bridge voltage source inverter employing the multipulse PWM technique.	6 Marks	L2	CO4	PO7
		(OR)				
10.		Explain the operation of three phase volage source inverter for 180-degree mode of operation.	12 Marks	L3	CO4	PO2

CODE No.: 19BT60202 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

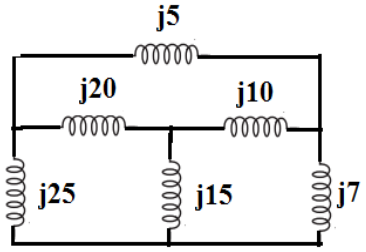
POWER SYSTEM ANALYSIS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define per unit quantity. Mention its advantages.	4 Marks	L1	CO1	PO1
	b)	A 50kW, three phase, Y connected load is fed by a 210kVA transformer with voltage rating 11kV/415V through a feeder. The length of feeder is 1km and the impedance of the feeder is (0.25+j 4) ohm/km. If the load power factor is 0.8. Solve the p.u impedance of the feeder and load.	8 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Develop Y_{bus} by direct inspection method for the following network; assume the values are in p.u. admittances. 	8 Marks	L3	CO1	PO5
	b)	What are the advantages of Y_{bus} over Z_{bus}?	4 Marks	L1	CO1	PO2

UNIT-II

3.	a)	Show the generalized expressions for elements of Jacobian matrix for fast decoupled load flow method.	6 Marks	L2	CO2	PO2
	b)	Model the expression for the limits of reactive power and discuss how it is considered for PV bus to PQ bus conversion.	6 Marks	L3	CO2	PO2
		(OR)				
4.	a)	For the power system network, the generators are connected at all four buses, while loads are at buses 2, 3 and 4. The values of real and reactive powers are listed in table 1. All buses other than slack bus are of P-Q type. Line data are given in table 2. Assuming a flat voltage start, determine the voltage magnitudes and the phase angles at the three buses using G- S(Gauss-Seidel) method for first iteration.	8 Marks	L3	CO2	PO5

Table 1. Input data

Bus	P_i	Q_i	V_t	Type of bus
1	--	--	1.05 0º	Slack
2	-0.45	-0.15	--	PQ
3	-0.51	-0.25	--	PQ
4	-0.6	-0.3	--	PQ

Table 2. Line data

Line No	Bus Code (p-q)	Line Impedance
1	1-2	0.08 + j0.2
2	1-4	0.05 + j0.1
3	2-3	0.04 + j0.12
4	3-4	0.04 + j0.14

	b)	Compare the decoupled method and fast decoupled methods with the Newton Rapson method.	4 Marks	L4	CO2	PO5

UNIT-III

5.		Two 11 kV, 3-phase, 5MVA generators having sub transient reactance of 3% and 2% respectively operate in parallel. Suppose the power load through a 11/220 kV, 10 MVA transformer has 4% equivalent reactance. Calculate fault current and fault MVA for three phase fault occurs on the HT side of the transformer. Also calculate the fault MVA supplied by each generator.	12 Marks	L3	CO3	PO2
		(OR)				
6.		For a three phase symmetrical fault on a balanced power system using matrix notation, Interpret the expression for i) current ii) current at any other bus iii) Voltage at any bus excluding the faulted bus.	12 Marks	L2	CO3	PO1

UNIT-IV

7.	a)	What do you understand by sequence networks? What is their importance in unsymmetrical fault calculations?	6 Marks	L1	CO3	PO4
	b)	Derive the expression for fault current in single line to ground fault and draw the sequence network representing LG fault.	6 Marks	L3	CO3	PO1
		(OR)				
8.	a)	A 25 MVA, 13.2 kV alternator with solidly grounded neutral has a sub transient reactance of 0.25 p.u. The negative and zero sequence reactance's are 0.35 and 0.1 p.u. respectively. A single line to ground fault occurs at the terminals of an unloaded alternator; Examine the fault current and the line-to-line voltages. Neglect resistance.	8 Marks	L4	CO3	PO2
	b)	Explain operator 'a' and what are the properties of operator 'a'.	4 Marks	L2	CO3	PO1

UNIT-V

9.	a)	Define steady state stability and stability limit. What are the techniques available to improve the steady state stability?	6 Marks	L1	CO4	PO2
	b)	A 4-pole, 50 Hz, 26 kV turbo alternator has a rating of 100 MVA, p.f 0.8 lag. The moment of inertia of rotor is 8000 kg-m². Interpret M and H.	6 Marks	L2	CO4	PO4
		(OR)				
10.	a)	Derive an expression for steady state stability limit of a short transmission line having sending end and receiving end voltages V_s and V_r an impedance Z.	6 Marks	L3	CO4	PO1
	b)	A synchronous generator, capable of developing 500MW power per phase, operates at a power angle of 8°. By how much can the input shaft power be increased suddenly without loss of stability? Assume that P_{max} will remain constant.	6 Marks	L4	CO4	PO5

CODE No.: 19BT60204 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

HIGH VOLTAGE ENGINEERING

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define field enhancement factor. Discuss its importance in Designing insulating system.	6 Marks	L1	CO1	PO1
	b)	Distinguish electrical field strength and stress. Mention various factors that affect the breakdown strength of insulating material.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	What are the various reasons for over voltages and enumerate the adverse effects of over voltages in power system?	6 Marks	L1	CO1	PO1
	b)	How do earthling screen and ground wires provide protection against direct lightning strokes?	6 Marks	L1	CO1	PO1

UNIT-II

3.	a)	Explain the Streamer theory of breakdown in air at atmospheric pressure.	6 Marks	L1	CO1	PO1
	b)	In an experiment for determining the breakdown strength of transformer the following observations are made. Determine the power law dependence between the gap spacing and the applied voltage of the oil.	6 Marks	L2	CO1	PO2

Gap Spacing(mm)	4	6	10	12
Voltage at Breakdown(kV)	90	140	210	255

(OR)

4.	a)	What are commercial liquid dielectrics, and how are they different from pure liquid dielectrics?	6 Marks	L1	CO1	PO1
	b)	A coaxial cylindrical capacitor is to be designed with an effective length of 20 cm. The capacitor is expected to have a capacitance of 1000 pF and to operate at 15 kV, 500 kHz. Select a suitable insulating material and give the dimensions of the electrodes.	6 Marks	L2	CO1	PO2

UNIT-III

5.	a)	Why is a Cockcroft-Walton circuit preferred for voltage multiplier circuits? Explain its working with a schematic diagram.	6 Marks	L1	CO2	PO2
	b)	A Cockcroft-Walton type voltage multiplier has eight stages with capacitances, all equal to 0.05 μF. The supply transformer secondary voltage is 125 kV at a frequency of 150 Hz. If the load current to be supplied is 5 mA, find: i) the percentage ripple, ii) the regulation, iii) the optimum number of stages for minimum regulation or voltage drop.	6 Marks	L2	CO2	PO4
		(OR)				

6.	a)	What is a Tesla coil? How is damped high-frequency oscillations obtained from a Tesla coil?	6 Marks	L1	CO2	PO1
	b)	An impulse generator has eight stages with each condenser rated for 0.16 μF and 125 kV. The load capacitor available is 1000pF. Find the series resistance and the damping resistance needed to produce 1.2/50 μs impulse wave. What is the maximum output voltage of the generator, if the charging voltage is 120 kV?	6 Marks	L1	CO2	PO2
		UNIT-IV				
7.	a)	Give the basic circuit for measuring the peak voltage of i) ac voltage, and ii) impulse voltage. What is the difference in measurement technique in the above two cases?	6 Marks	L1	CO3	PO1
	b)	A generating voltmeter has to he designed so that it can have a range from 20 to 200 kV dc If the indicating meter reads a minimum current of 2μα and maximum current of 25μα, what should the capacitance of the generating voltmeter be?	6 Marks	L2	CO3	PO2
		(OR)				
8.	a)	Explain how a sphere gap can be used to measure the peak value of voltages. What are the parameters and factors that influence such voltage measurement?	6 Marks	L1	CO3	PO1
	b)	What are the different types of resistive shunts used for impulse current measurements? Discuss their characteristics and limitations.	6 Marks	L1	CO3	PO2
		UNIT-V				
9.	a)	Explain the terms: i) withstand voltage, ii) flashover voltage, iii) 50% flashover voltage, and iv) wet and dry power frequency tests as referred to high voltage testing.	6 Marks	L1	CO4	PO1
	b)	How is a lossy dielectric represented? Explain how an ideal capacitor in parallel with a resistor can represent a lossy dielectric over a wide frequency range.	6 Marks	L1	CO4	PO2
		(OR)				
10.	a)	Briefly explain the measurement of DC resistivity using loss of charge method.	6 Marks	L1	CO4	PO1
	b)	What is the significance of impulse tests? Briefly explain the impulse testing of insulators.	6 Marks	L1	CO4	PO1

CODE No.: 19BT60205 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

SPECIAL ELECTRICAL MACHINES

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the working of open loop controller of 3-phase Variable Reluctance stepper motor with the help of a neat sketch.	6 Marks	L2	CO1	PO1
	b)	Explain the modes of excitation of Stepper Motor with neat diagram.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Brief the construction and working principle of hybrid stepper motor with neat diagrams.	6 Marks	L2	CO1	PO2
	b)	Explain in detail the multi stack construction of Stepper Motor.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	A 3-Φ switched reluctance motor has 6 stator poles and 4 rotor teeth. Draw the feasible zone for stator and rotor pole arcs. Design the pole arc and rotor tooth arc.	6 Marks	L4	CO2	PO3
	b)	From the fundamentals, derive the expression for torque developed in a switched reluctance motor.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Develop Switched Reluctance Motor using two converter topologies and draw relevant diagrams.	6 Marks	L2	CO2	PO1
	b)	What is the step angle of a three-phase switched reluctance motor having 12 stator poles and 8 rotor poles? What is the commutation frequency in each phase at a speed of 6000 r.p.m.?	6 Marks	L4	CO2	PO3
		UNIT-III				
5.	a)	Discuss in detail about the construction and working of Synchronous Reluctance Motor with neat diagrams.	6 Marks	L2	CO3	PO1
	b)	Describe in detail the speed – Torque characteristics of Synchronous Reluctance Motor.	6 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Explain the construction and operation of axial and radial flux machines. List the advantages and disadvantages of each construction.	8 Marks	L2	CO3	PO1
	b)	Elaborate the various applications of synchronous reluctance motor.	4 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	Explain the principle of operation of permanent magnet brushless DC motor with neat diagram.	6 Marks	L2	CO4	PO2
	b)	What is meant by sensor less control? What are its advantages?	6 Marks	L2	CO4	PO2
		(OR)				
8.	a)	Explain the principle of operation of permanent magnet AC motor with neat diagram.	6 Marks	L2	CO4	PO2
	b)	Derive the expression for torque developed in a three-phase BLDC motor with two rotor poles having an arc length of 180° each.	6 Marks	L2	CO4	PO5

UNIT-V

9.	a)	With a neat diagram, explain the construction and working principle of AC series motor.	6 Marks	L2	CO5	PO1
	b)	Derive the thrust equation of linear synchronous motor.	6 Marks	L2	CO5	PO1
		(OR)				
10.	a)	Develop the equivalent circuit of a linear induction motor at standstill and running conditions.	6 Marks	L2	CO5	PO1
	b)	Draw the block diagram of control scheme for linear synchronous motor. Discuss the function of different blocks in the control circuit.	6 Marks	L2	CO5	PO1

CODE No.: 19BT60207 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

DESIGN AND ESTIMATION OF ELECTRICAL SYSTEMS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain about selection of size of conductor applicable to residential wiring system.	6 Marks	L2	CO1	PO1
	b)	List out the general rules to be followed for internal wiring of a domestic building.	6 Marks	L2	CO1	PO8
		(OR)				
2.	a)	Draw and explain a typical wiring diagram for a house installation showing connections for energy meter, main switch and distribution boards.	6 Marks	L3	CO1	PO1
	b)	Explain about various methods of residential wiring systems	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Enumerate the main components of an Over Head Transmission lines and explain each of them.	6 Marks	L1	CO2	PO1
	b)	List the points to be considered at the time of erection of overhead lines.	6 Marks	L2	CO2	PO2
		(OR)				
4.	a)	Explain about testing and commissioning of over head transmission line.	6 Marks	L1	CO2	PO1
	b)	An Over Head 11 kV, 50 Hz line has to be erected using 27 kg, 10 m long steel poles and copper wire of size no. 3/2.6424 m, with an average span of 150 m. Furnish the list of material required and estimate the cost/km.	6 Marks	L3	CO2	PO11
		UNIT-III				
5.	a)	Describe the selection of switch gears for 33kV/11kV substation and draw substation lay out	6 Marks	L2	CO3	PO3
	b)	Explain in brief design process of industry less than 1 MVA load.	6 Marks	L2	CO3	PO2
		(OR)				
6.	a)	Illustrate the quantity of materials required for the installation of 1 MVA indoor type 11 kV/440 V transformers.	6 Marks	L3	CO3	PO11
	b)	Explain about calculation of full load current and selection of size of the conductor size for DC motor.	6 Marks	L2	CO3	PO2
		UNIT-IV				
7.	a)	Explain the following terms : i) Candle Power. ii) Luminance. iii) Illumination. iv) Luminous Intensity.	6 Marks	L2	CO4	PO2
	b)	A small area of 10 meters in diameter is to be illuminated by a lamp suspended at a height of 4.5 meters over the center of area. A lamp having an efficacy of 30 lumens per watt is fitted with a reflector which directs the light output only over the surface to be illuminated. If the utilization coefficient is 0.66 and illumination 850 lux, Calculate the wattage of the lamp.	6 Marks	L3	CO4	PO2

(OR)

8.		Explain in brief about: i) Sodium vapour lamp. ii) High pressure mercury vapour lamp.	12 Marks	L2	CO4	PO2

UNIT-V

9.		Explain suitable welding technique to fabricate transformer oil tank.	12 Marks	L2	CO5	PO2

(OR)

10.	a)	A 50 kW single phase, 220V resistance oven employees circular nichrome wire for its heating element. If the wire temperature is not to exceed 15000C and the temperature of the charge is to be 4500C, calculate the size and length of wire required. Assume e = 0.95 and radiation efficiency K = 0.65. Calculate the temperature of wire when the charge is cold (250C).	6 Marks	L3	CO5	PO2
	b)	Explain in detail about dielectric heating.	6 Marks	L2	CO5	PO2

CODE No.: 19BT60209 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

POWER SYSTEM AUTOMATION

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	What is Deregulation? List the advantages of Deregulation in power system.	6 Marks	L1	CO1	PO1
	b)	Explain about Congestion Management briefly.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Explain functions of power system control centers.	6 Marks	L2	CO1	PO6
	b)	Discuss briefly about Investment factor in power system.	6 Marks	L2	CO1	PO6
		UNIT-II				
3.	a)	Describe about Intelligent electronic devices in SCADA system.	6 Marks	L2	CO2	PO6
	b)	With block diagram explain Remote terminal unit.	6 Marks	L3	CO2	PO6
		(OR)				
4.	a)	Explain Data concentrators and merging units in power system automation.	6 Marks	L2	CO2	PO6
	b)	Explain the objectives and functions of Human-Machine Interface (HMI).	6 Marks	L2	CO2	PO8
		UNIT-III				
5.	a)	Compare conventional and automated substations. List out merits and demerits of automated substations.	6 Marks	L2	CO3	PO1
	b)	Describe briefly substation automation application functions.	6 Marks	L2	CO3	PO1
		(OR)				
6.		Draw the substation automation architecture and explain the function of each block.	12 Marks	L2	CO3	PO6
		UNIT-IV				
7.	a)	Explain Data acquisition and communication of EMS frame work in control centers.	6 Marks	L2	CO3	PO1
	b)	Explain briefly the concept of Smart transmission through control centers.	6 Marks	L2	CO3	PO1
		(OR)				
8.		Explain control centers functions with respect to Generation operation and management.	12 Marks	L2	CO3	PO1
		UNIT-V				
9.		With neat block diagram, explain in detail about the distribution automation architecture.	12 Marks	L2	CO4	PO1
		(OR)				
10.	a)	Describe overview of Distribution automation system.	6 Marks	L2	CO4	PO6
	b)	List out applications of DMS frame work.	6 Marks	L2	CO4	PO6

CODE No.: 19BT60241 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

RENEWABLE ENERGY SOURCES

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	What are the various forms of energy? And briefly explain about non conventional energy sources.	6 Marks	L2	CO1	PO1
	b)	Write a short notes on the following: i) Green house effect. ii) Ozone layer depletion. iii) Global warming.	6 Marks	L3	CO1	PO6
		(OR)				
2.		What are the 5 major renewable energy sources? How can renewable energy contribute to sustainable development? Explain in detail.	12 Marks	L3	CO1	PO7
		UNIT-II				
3.	a)	What are the main components of a flat plate solar collector? Explain the function of each.	6 Marks	L3	CO2	PO1
	b)	Illustrate the absorption and scattering phenomenon of solar radiation in earth's atmosphere.	6 Marks	L4	CO2	PO6
		(OR)				
4.	a)	Explain the principle of photo-voltaic effect with neat sketches.	6 Marks	L3	CO2	PO1
	b)	Analyze the working of Solar Water heater with component based diagram.	6 Marks	L4	CO2	PO1
		UNIT-III				
5.	a)	Interpret the working of Wind Energy Conversion System (WECS) with main components.	6 Marks	L2	CO3	PO1
	b)	Discuss different types of horizontal-axis wind turbines.	6 Marks	L3	CO3	PO1
		(OR)				
6.	a)	Deduce an expression for the total power of a wind stream taking all factors into consideration.	6 Marks	L4	CO3	PO1
	b)	Distinguish horizontal-axis & vertical axis wind turbines.	6 Marks	L5	CO3	PO1
		UNIT-IV				
7.	a)	What are the advantages and disadvantages of geothermal energy?	6 Marks	L3	CO4	PO1
	b)	Determine current – voltage characteristics of Fuel Cell and give its Significance.	6 Marks	L3	CO4	PO1
		(OR)				
8.	a)	What is meant by anaerobic digestion? What are the factors that affect bio-digestion? Explain briefly.	6 Marks	L3	CO4	PO6
	b)	Explain about vapor dominated and liquid dominated geothermal power plants.	6 Marks	L3	CO4	PO1

UNIT-V

9.	a)	Enumerate the concept of Ocean Thermal Energy Conversion (OTEC).	6 Marks	L2	CO5	PO1
	b)	Derive an expression for Power generated by a Tidal System.	6 Marks	L4	CO5	PO1
		(OR)				
10.	a)	Illustrate the principle and working of tidal power plant with its schematic diagram.	6 Marks	L4	CO5	PO1
	b)	Explain six each merits and demerits of wave energy.	6 Marks	L2	CO5	PO1

CODE No.: 19BT60301 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

INDUSTRIAL ENGINEERING AND MANAGEMENT

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain any two theories applicable to management.	6 Marks	L1	CO1	PO1
	b)	Mention the role of Managers for meeting the goals of the organization.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Explain any two functions of the management.	6 Marks	L1	CO1	PO1
	b)	What is the role of corporate governance?	6 Marks	L2	CO1	PO1 PO6
		UNIT-II				
3.	a)	Describe the Maslow's Hierarchy of human needs.	6 Marks	L1	CO2	PO1 PO2
	b)	Explain why management by wandering around considered as effective communication. What are the barriers to effective communications?	6 Marks	L2	CO2	PO1 PO2
		(OR)				
4.	a)	Describe the importance of "leading the effective teams" in a management of organizational behavior.	6 Marks	L1	CO2	PO1 PO2
	b)	State the Qualities required for a leader for organizational transformation.	6 Marks	L2	CO2	PO1 PO2
		UNIT-III				
5.	a)	Define Work Study. State its objectives. Differentiate between Method Study and Work Measurement.	6 Marks	L1	CO3	PO1 PO2 PO3
	b)	What is the purpose of string diagram and explain it with an example?	6 Marks	L2	CO3	PO1 PO2 PO3
		(OR)				
6.	a)	What is performance rating? Give an elaborate description about various methods of performance rating.	6 Marks	L1	CO3	PO1 PO2 PO3
	b)	The worker in an engineering company is expected to work for 420 min in a shift of 8 hrs. The remaining time is allows for rest and personal needs etc. i) Determine the standard time per piece of a job whose normal time is 4 min ii) Calculate the number of pieces produced per day iii) If the worker produced 100 pieces in his shift what is his efficiency.	6 Marks	L3	CO3	PO1 PO2 PO3

UNIT-IV

7.	a)	Explain the different types of Production.	6 Marks	L1	CO4	PO1 PO2
	b)	What are advantages and disadvantages of urban and suburban locations for a plant? Compare rural and urban sites for the location of the plant.	6 Marks	L2	CO4	PO1 PO2

(OR)

8.	a)	Draw and explain Bath tub Curve.	6 Marks	L1	CO4	PO1 PO2
	b)	A system is composed of three components. Component 1 is in series with the parallel combination of components 2 and 3. Given λ_1=2 failures per year and $\lambda_2=\lambda_3$=3 failures/year. Calculate the reliability and MTTF of the system for a mission time of 1000 hours.	6 Marks	L3	CO4	PO1 PO2 PO3

UNIT-V

9.	a)	What is the purpose of control charts? Explain how this purpose achieved in manufacturing.	6 Marks	L2	CO5	PO1 PO2
	b)	In a factory producing spark plug the number of defectives found in inspection of 20 lots of 100 each, is given below:	6 Marks	L3	CO5	PO1 PO2 PO3

Lot No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
No of defectives	5	10	12	8	6	4	6	3	3	5	4	7	8	3	3	4	5	8	6	10

Construct appropriate control chart and state whether the process is in statistical control.

(OR)

10.	a)	What is O.C Curve? Explain the step by step procedure for construction of an O.C curve.	6 Marks	L1	CO5	PO1 PO2
	b)	What are factories Act? As per the factories act 1948, what are the major provisions for safety and health?	6 Marks	L1	CO5	PO1 PO2

CODE No.: 19BT60302 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

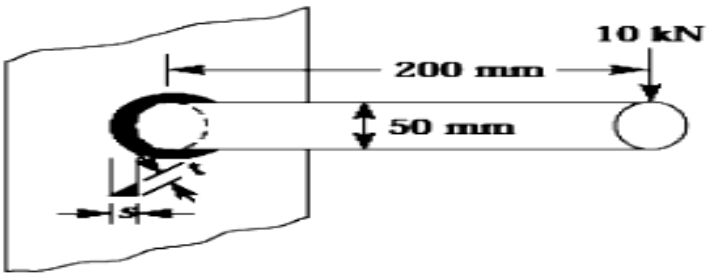
DESIGN OF MACHINE ELEMENTS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the general considerations of design process.	4 Marks	L2	CO1	PO1 PO2
	b)	A steel alloy has an ultimate tensile strength of 600 MPa, yield strength of 400 MPa and an endurance limit of 200 MPa under reversed bending. Sketch a modified Goodman diagram. Indicate on the sketch and give the magnitude of the endurance stress for released load.	8 Marks	L3	CO1	PO1 PO2 PO3
		(OR)				
2.	a)	Explain the basic modes of failure of a mechanical component.	4 Marks	L2	CO1	PO1 PO2
	b)	A machine component is subjected to a flexural stress which fluctuates between +300 MN/m^2 and -150 MN/m^2. Determine the value of minimum ultimate strength according to 1. Modified Goodman relation; and 2. Soderberg relation. Take yield strength = 0.55 Ultimate strength; Endurance strength= 0.5 Ultimate strength and factor of safety = 2.	8 Marks	L3	CO1	PO1 PO2 PO3
		UNIT-II				
3.		Explain the design procedure for Flange coupling with neat sketch in detail.	12 Marks	L2	CO2	PO1 PO2
		(OR)				
4.		Design a cotter joint to support a load varying from 30kN in compression to 30kN in tension. The material used is carbon steel. Assume tensile stress=compressive stress = 50 Mpa, Shear stress = 35 Mpa and crushing stress = 90 Mpa.	12 Marks	L4	CO2	PO1 PO2 PO3
		UNIT-III				
5.	a)	Explain the types of welded joints.	4 Marks	L2	CO3	PO1 PO2
	b)	A plate 100 mm wide and 10 mm thick is to be welded with another plate by means of transverse welds at the ends. If the plates are subjected to a load of 70kN, find the size of weld for static as well as fatigue load. The permissible tensile stress should not exceed 70MPa.	8 Marks	L3	CO3	PO1 PO2 PO3
		(OR)				
6.		A 50mm diameter solid shaft is welded to a flat plate as shown in fig. if the size of the weld is 15 mm; Calculate the maximum normal and shear stress in the weld.	12 Marks	L3	CO3	PO1 PO2 PO3



UNIT-IV

7.	A full journal bearing operates under an axial load of 25 kN. The length and diameter of the journal are 150mm and 100mm respectively. The radial clearance is 0.05mm. The journal rotates at a speed of 300 r.p.m. If the viscosity of the oil used at the operating temperature is 0.01 kg/ms, find the coefficient of friction in the bearing and power loss due to friction. Use McKee's equation.	12 Marks	L3	CO4	PO1 PO2 PO3
	(OR)				
8.	A single row ball bearing carries a radial load of 8 kN and an axial thrust of 3.5 kN. The radial load factor and the axial load factor are given as 0.56 and 1.48 respectively. Desired reliability is 90 percent. The mounting of the bearing is such that the inner ring is stationary. The shaft rotates at 500 r.p.m and the expected life is 2500 operating hours. Find the dynamic load capacity of the bearing required for the application.	12 Marks	L4	CO4	PO1 PO2 PO3

UNIT-V

9.	A helical compression spring made of oil tempered carbon steel, is subjected to a load which varies from 400 N to 1000 N. The spring index is 6 and the design factor of safety is 1.25. If the yield stress in shear is 770MPa and endurance stress in shear is 350MPa, find: i). Size of the spring wire, ii). Diameters of the spring, iii). Number of turns of the spring, and iv). Free length of the spring. The compression of the spring at the maximum load is 30 mm. The modulus of rigidity for the spring material may be taken as 80kN/mm^2.	12 Marks	L4	CO5	PO1 PO2 PO3
	(OR)				
10.	A spur gear pair with a module of 6 mm has transmission ratio of 4. The number of teeth on the pinion is 16 of 200 pressure angle, full depth and involute profile. Face width of the teeth may be taken as 10 times module. Taking the permissible bending stress as 105 MPa, calculate the power that the gear pair can transmit based on the beam strength of the teeth.	12 Marks	L4	CO5	PO1 PO2 PO3

❀ ❀ ❀

CODE No.: 19BT60303 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

HEAT TRANSFER

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What are the mechanisms of heat transfer? How are they distinguished from each other?	6 Marks	L1	CO1	PO1 PO2
	b)	Determine the steady heat transfer per unit area through a 3.8 cm thick homogeneous slab with its two faces maintained at uniform temperature of 35ºC and 25ºC. The thermal conductivity of wall material is 1.9×10^{-4} kW/mºC.	6 Marks	L3	CO1	PO1 PO2 PO3
		(OR)				
2.	a)	Derive a 3-dimensional general conduction equation in Cartesian Co-ordinates for a homogeneous material.	6 Marks	L2	CO1	PO1 PO2
	b)	Consider a steam pipe of length 20 m, inner radius 6 cm, outer radius = 8 cm, and thermal conductivity k = 20 W/m·K. The inner and outer surfaces of the pipe are maintained at average temperatures of 150°C and 60°C, respectively. Determine the rate of heat loss from the steam through the pipe.	6 Marks	L3	CO1	PO1 PO2 PO3 PO4

UNIT-II

3.	a)	List out the various types of fins.	6 Marks	L1	CO2	PO1 PO2
	b)	A fin 30 cm long and 10mm diameters throughout is made of steel alloy of thermal conductivity 43 W/m-deg. the fin attached to a plane heated wall at 200ºC temperature, extends into surroundings at 25ºC and convective heat transfer coefficient of 120W/m²ºC. Workout the heat flow rate from the fin to surroundings. Presume that the tip of the fin is insulated.	6 Marks	L3	CO2	PO1 PO2 PO3 PO4
		(OR)				
4.	a)	For a transient heat conduction with negligible internal resistance, Prove that: $(\theta/\theta_i) = \exp(-B_i F_0)$ where $\theta = (T-T_\infty)$ and $\theta_i = (T_i-T_\infty)$	6 Marks	L2	CO2	PO1 PO2 PO3
	b)	Alloy steel ball of 15 mm diameter heated to 1000ºC is quenched in a bath at 120 ºC. The material properties of the ball are k=56.94 W/m.K, Cp = 0.45kJ/kg.K, ρ = 7860 kg/m³, h=41.66 W/m²·K. Determine (i) Temperature of ball after 20 seconds (ii) Time for the ball to cool to 500 ºC.	6 Marks	L3	CO2	PO1 PO2 PO3 PO4

UNIT-III

5.	a)	What do you understand by the hydrodynamic and thermal boundary layers? Illustrate with reference to flow over a flat heated plate.	6 Marks	L2	CO3	PO1 PO2

	b)	Air at 20°C at atmospheric pressure flows over a flat plate at a velocity of 3 m/s. If the plate is 1 m wide and 80° C, calculate the following at x = 300 mm. i) Hydrodynamic boundary layer thickness, ii) Thermal boundary layer thickness, iii) Local friction coefficient, iv) Average friction coefficient, v) Local heat transfer coefficient, vi) Average heat transfer coefficient, and vii) Heat transfer.	6 Marks	L3	CO3	PO1 PO2 PO3 PO4
		(OR)				
6.	a)	Define Grashof number and explain its significance in free convection heat transfer.	6 Marks	L2	CO3	PO1 PO2
	b)	A vertical pipe of 20 cm outer diameter, at a surface temperature of 100ºC is in a room where the air is at 20ºC. The pipe is 3 m long. What is the rate of heat loss per meter length of the pipe?	6 Marks	L3	CO3	PO1 PO2 PO3
		UNIT-IV				
7.	a)	Derive expression for LMTD for counter flow double pipe heat exchanger.	6 Marks	L3	CO4	PO1 PO2
	b)	Water enters a counter flow, double pipe heat exchanger at 15°C, flowing at the rate of 1300 kg/h. It is heated by oil (C_p =2000 J/kgK) flowing at the rate of 550 kg/h from the inlet temperature of 94°C. For an area of 1 m² and an overall heat transfer coefficient of 1075 W/m²K, determine the total heat transfer and the outlet temperature of water and oil.	6 Marks	L3	CO4	PO1 PO2 PO3 PO4
		(OR)				
8.	a)	Discuss briefly the various regimes in boiling heat transfer	6 Marks	L2	CO4	PO1 PO2
	b)	Distinguish between filmwise and dropwise condensation. Which of two gives a higher heat transfer coefficient? Why?	6 Marks	L3	CO4	PO1 PO2
		UNIT-V				
9.	a)	State Planck, Wien's displacement and Kirchhoff laws.	6 Marks	L1	CO5	PO1 PO2
	b)	A 20 cm diameter spherical ball at 800 K is suspended in the air. Assuming that the ball closely approximates a black body, determine: i) total black body emissive power and ii) the spectral black body emissive power at a wave length of 3μm.	6 Marks	L3	CO5	PO1 PO2 PO3 PO4
		(OR)				
10.	a)	Explain the following: i) Irradiation ii) Radiosity iii) radiation shape factor	6 Marks	L2	CO5	PO1 PO2
	b)	Two very large parallel plates are maintained at uniform temperatures of 600 K and 400K and have emissivities 0.5 and 0.9 respectively. Determine the net rate of radiation heat transfer between the two surfaces per unit area of the plates.	6 Marks	L3	CO5	PO1 PO2 PO3 PO4

CODE No.: 19BT60307 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

INTERNAL COMBUSTION ENGINES

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Classify IC engines based on cylinder arrangement.	6 Marks	L1	CO1	PO1 PO2
	b)	Compare Four-stroke and Two-stroke engines and give examples for each case.	6 Marks	L1	CO1	PO1 PO2
		(OR)				
2.	a)	Explain briefly about Cooling and lubricating systems employed for IC engines.	6 Marks	L2	CO1	PO1
	b)	List out the requirements of fuel supply systems for CI engines and give the names of different fuel supply systems used for diesel engines.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Discuss briefly the different parameters considered in the Fuel-air cycle analysis.	6 Marks	L2	CO2	PO1
	b)	Explain how the variable-specific heat and dissociation will affect the performance of actual cycles.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Compare air standard cycles and actual cycles.	6 Marks	L2	CO2	PO1
	b)	Define volumetric efficiency and discuss the factors affecting volumetric efficiency.	6 Marks	L2	CO2	PO1
		UNIT-III				
5.	a)	Explain the normal combustion in SI engine with the help of the Pressure ***Vs*** Crank angle diagram and show various stages in it.	6 Marks	L2	CO3	PO1
	b)	Explain the phenomena of Detonation in SI engines and discuss its effects.	6 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Explain the fuel-air requirements for starting, idling, normal cruising speeds, and acceleration periods of SI engine with the help of a neat sketch.	6 Marks	L2	CO3	PO1 PO7
	b)	Write a short note on: i) Octane rating of SI engine fuels. ii) Requirements of the combustion chamber for SI engines.	6 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	Discuss briefly different stages of combustion in CI engines with the help of P-θ diagram.	6 Marks	L2	CO4	PO1 PO2
	b)	Discuss briefly the factors affecting the Ignition delay period in CI engines.	6 Marks	L2	CO4	PO1 PO2
		(OR)				

8.	a)	Discuss briefly the different methods adopted to reduce CI engine emissions.	6 Marks	L2	CO4	PO1
	b)	Explain the fuel-air requirements of CI engines at different operating conditions and list out the different combustion chambers used for CI engines.	6 Marks	L2	CO4	PO1 PO7

UNIT-V

9.	a)	What are the advantages and disadvantages of an electronic fuel injection system and list out different sensors used in this system?	6 Marks	L2	CO5	PO1 PO2
	b)	Why Gasoline injection is necessary for SI engines and explain the working of the Gasoline direction injection system?	6 Marks	L2	CO5	PO1 PO2
		(OR)				
10.	a)	Explain the working of the Lean burn engine with the help of a neat sketch and give its merits.	6 Marks	L2	CO5	PO1 PO2
	b)	What is a variable compression ratio ignition engine and discuss the methods to vary the compression ratio in CI engines?	6 Marks	L2	CO5	PO1 PO2

CODE No.: 19BT60309 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

QUALITY MANAGEMENT AND RELIABILITY ENGINEERING

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Write a short note on ISO 9000 Quality Management System.	4 Marks	L2	CO1	PO1
	b)	"ISO certification quality system speaks about the company's commitment for Customer service". Do you agree? Substantiate your answer with suitable examples.	8 Marks	L2	CO1	PO1 PO6
		(OR)				
2.		Classify the "Costs of Quality (CoQ)" and briefly explain each one of them.	12 Marks	L3	CO1	PO1 PO6

UNIT-II

3.		Briefly explain the seven tools of Quality Control.	12 Marks	L2	CO2	PO1 PO2
		(OR)				
4.		A quality control inspector at the Cocoa Fizz soft drink company has taken ten samples with four observations each of the volume of bottles filled. The data and the computed means are shown in the table. Use this information to determine process mean and whether the process is in control for the operation. (for sample size n=4, A_2=0.73, D_3 = 0, D_4 = 2.28).	12 Marks	L3	CO2	PO1 PO2 PO3 PO6

Sample Number	Observations (Volume in Oz.)			
	S1	S2	S3	S4
1	15.85	16.02	15.83	15.93
2	16.12	16.00	15.85	16.01
3	16.00	15.91	15.94	15.83
4	16.20	15.85	15.74	15.93
5	15.74	15.86	16.21	16.10
6	15.94	16.01	16.14	16.03
7	15.75	16.21	16.01	15.86
8	15.82	15.94	16.02	15.94
9	16.04	15.98	15.83	15.98
10	15.64	15.86	15.94	15.89

UNIT-III

5.		A production shop decides to use single sampling plan to inspect its products which are offered in lots of 1000 items for inspection. The management wants to know the effect of sample on operating characteristics. However, it is decided that number of defective items should not be more than 2 in a sample. If three sets of experiments are conducted with three samples of sizes 50, 60 and 100, discuss the effect of the sample size on the probability of acceptance by constructing the OC curve.	12 Marks	L3	CO3	PO1 PO2 PO3 PO6

(OR)

6.		Explain the procedures of single and double sampling plans with the help of flow charts. Mention their merits and demerits.	12 Marks	L2	CO3	PO1 PO2

UNIT-IV

7.		A, B and C are three components in series with reliabilities R_A, R_B, R_C respectively. Components D and E which are in series with reliabilities R_D, R_E respectively are parallel to component B. Deduce the expression for the overall reliability of the system.	12 Marks	L3	CO4	PO3 PO6 PO7

(OR)

8.	a)	Distinguish between MTBF and MTTF. For which types of equipment are they used?	6 Marks	L2	CO4	PO1 PO2
	b)	Explain the significance of the term "Reliability Improvement Factor (RIF)".	6 Marks	L2	CO4	PO2

UNIT-V

9.		Describe in detail following terms with suitable examples. i) Operating Availability. ii) Intrinsic Availability. iii) Achieved Availability.	12 Marks	L2	CO4	PO2 PO3 PO7

(OR)

10.		A medical equipment manufacturing company subjected 1000 heart pacemakers to 5,000 hours of testing. Halfway through the testing, 5 pacemakers failed. What was the failure rate in terms of the following? i) Percentage of failures. ii) Number of failures per unit-hour. iii) Number of failures per unit-year. iv) If 1,100 people receive pacemaker implants, how many units can we expect to fail during the following year?	12 Marks	L3	CO4	PO2 PO3 PO6

CODE No.: 19BT60310 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

AUTOMOTIVE FUELS AND COMBUSTION

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Write a note on fossil fuels.	6 Marks	L2	CO1	PO1
	b)	Briefly explain the chemical structure of petroleum.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Briefly describe the following types of solid fuels: Wood, coke, Charcoal and briquetted coal.	6 Marks	L1	CO1	PO1
	b)	Briefly describe the different petroleum based liquid fuels of importance in IC engines.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Explain the physical properties of fuel.	6 Marks	L2	CO2	PO1
	b)	Define Calorific value of a fuel. Differentiate between higher and lower calorific values.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Describe the properties of coal obtained by ultimate analysis.	4 Marks	L2	CO2	PO1
	b)	Distinguish clearly between Octane number and Cetane Number. What is their significance in rating of fuels for S.I and C.I engines?	8 Marks	L2	CO2	PO1 PO2
		UNIT-III				
5.	a)	Enumerate the desirable properties of alcohol as engine fuel.	6 Marks	L2	CO3	PO1
	b)	Discuss about the usage of alcohols in IC engines specific to their performance and emission parameters.	6 Marks	L2	C03	PO1 PO2
		(OR)				
6.	a)	Explain the production of vegetable oils from various vegetables.	6 Marks	L2	CO3	PO1
	b)	Describe the following: i) Biodiesel feedstock selection. ii) Raw material for biodiesel production.	6 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	Explain with a neat sketch the working of hydrogen operated diesel engine.	6 Marks	L2	CO3	PO1
	b)	Discuss the aspects of hydrogen storage and handling. Also list out the safety aspects in hydrogen usage as a fuel in an engine.	6 Marks	L2	CO3	PO1 PO7
		(OR)				
8.	a)	List the advantages and disadvantages of using the following alternative fuels: i) Hydrogen. ii) Biogas.	6 Marks	L2	CO3	PO1
	b)	Discuss the performance and emission characteristics of biogas in CI engines.	6 Marks	L2	CO4	PO1 PO2

UNIT-V

9.	a)	How particulate traps works in diesel engine emission reduction? Explain.	6 Marks	L2	CO4	PO1 PO2
	b)	Mention the importance of total emission control packages. Describe two types of total emission control packages with neat sketches.	6 Marks	L2	CO4	PO1 PO7
		(OR)				
10.	a)	What are various sources of automobile pollution and what are different pollutants emitted by an automobile?	6 Marks	L2	CO4	PO1 PO7
	b)	Illustrate the working of Positive Crankcase Ventilation (PCV) system with a neat sketch.	6 Marks	L2	CO4	PO1

CODE No.: 19BT60313 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

NON TRADITIONAL MACHINING PROCESSES

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Mention the characteristics of unconventional machining process.	4 Marks	L1	CO1	PO2
	b)	Explain the working principle of chemical machining with neat sketch.	8 Marks	L3	CO1	PO1
		(OR)				
2.	a)	List the various factors to be considered in the selection of Etchants for a particular application.	6 Marks	L1	CO1	PO6
	b)	What do you understand by the term unconventional or non-traditional machining methods? What is their importance?	6 Marks	L1	CO1	PO7
		UNIT-II				
3.	a)	Write the functions of an electrolyte.	4 Marks	L1	CO2	PO2
	b)	Explain the working principle, constructional details and advantages of electro chemical machining process with neat sketch.	8 Marks	L3	CO2	PO1
		(OR)				
4.	a)	List the advantages and disadvantages of ECM process.	4 Marks	L1	CO2	PO6
	b)	Describe the working principle, constructional details of electro chemical honing process.	8 Marks	L3	CO2	PO7
		UNIT-III				
5.	a)	What is the function of a transducer in USM?	4 Marks	L1	CO3	PO2
	b)	With the aid of simple sketch, explain the working principle of WJM process. List the practical applications.	8 Marks	L3	CO3	PO1
		(OR)				
6.	a)	Draw the graph showing the effect of slurry viscosity and MRR, in Ultra Sonic Machining (USM).	4 Marks	L1	CO3	PO6
	b)	How is metal removed in abrasive jet machining process? Explain the mechanism with neat diagram.	8 Marks	L3	CO3	PO7
		UNIT-IV				
7.	a)	Explain the term "Sinking" in Electro Discharge Machining Method.	4 Marks	L1	CO4	PO2
	b)	Explain the importance of flushing in EDM. Enumerate any one method of flushing used in EDM process.	8 Marks	L3	CO4	PO1
		(OR)				
8.	a)	Write short notes on grinding by EDM process. Draw a figure.	5 Marks	L1	CO4	PO6
	b)	Explain Electro discharge Machining process with a neat sketch.	7 Marks	L2	CO4	PO7
		UNIT-V				
9.	a)	List out various types of lasers used in LBM process.	4 Marks	L1	CO5	PO2
	b)	Explain in detail various industrial applications of plasma machining.	8 Marks	L3	CO5	PO1
		(OR)				

10.	a)	List various types of plasma arc torches used in PAM process.	4 Marks	L1	CO5	PO6
	b)	State the merits, limitations applications of electron beam and laser beam machining processes.	8Marks	L3	CO5	PO7

CODE No.: 19BT60315 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

REFRIGERATION AND AIR CONDITIONING

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the working of a Bell Coleman cycle and give its applications. What factors will influence its efficiency?	6 Marks	L2	CO1	PO1
	b)	A refrigerating plant working on Bell – Coleman cycle draws air from cold chamber at 1 bar and 12^{0}C and compressed to 6 bar. The air is cooled to 25^{0}C before passing into the expansion cylinder and expands to 1 bar. Determine the refrigerating capacity of the system and COP if the air circulation is 10 kg/min	6 Marks	L3	CO1	PO1 PO2 PO3
		(OR)				
2.	a)	Explain Vapor compression refrigeration system and show the processes on T-S and P-h property charts.	6 Marks	L2	CO1	PO1
	b)	What is the need of a cascade refrigeration system? Explain the system with a sketch and property charts.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Discuss about the different types of condensers used in VCR systems and list their applications.	6 Marks	L2	CO2	PO1
	b)	Explain the impact of refrigerants on the environment and suggest alternatives.	6 Marks	L4	CO2	PO1 PO2 PO6 PO7
		(OR)				
4.	a)	What is ASHRAE coding of refrigerants? Give examples for each class.	6 Marks	L2	CO2	PO1
	b)	Sketch and explain how a Thermostatic expansion valve operates. What are the merits of this device over other expansion devices used in refrigeration?	6 Marks	L2	CO2	PO1
		UNIT-III				
5.	a)	Explain working of Vortex tube refrigeration with a neat sketch	6 Marks	L2	CO3	PO1
	b)	Describe the working of a vapor absorption refrigeration system and obtain an expression for maximum COP of a VAR system	6 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Explain working of Thermo-electric refrigeration and obtain expression for COP	6 Marks	L2	CO3	PO1
	b)	Give a comparative study between Ammonia-water and Water-LiBr vapor absorption systems with respect to process and applications.	6 Marks	L4	CO3	PO1

UNIT-IV

7.	a)	Draw the layouts for a summer and Winter Air condition systems and discuss the processes with the help of a Psychometric chart.	6 Marks	L2	CO4	PO1
	b)	Atmospheric air is at 32^{0}C and contains 13.4 grams of water vapor per kg of dry air. Determine i) partial pressure of vapor, ii) Relative Humidity and iii) Dew point temperature. Use property relations and check results from psychrometric chart.	6 Marks	L3	CO4	PO1 PO2 PO3
		(OR)				
8.	a)	Atmospheric air at 15^{0}C DBT and 30% RH passes through a furnace and through a humidifier, in such a way that the final DBT is 32^{0}C and 40% RH. Determine i) Heat and moisture added to air and ii) Sensible heat factor of the process.	6 Marks	L3	CO4	PO1 PO2 PO3
	b)	What are the different heat sources to an AC room and explain how RSHF and GSHF are calculated?	6 Marks	L3	CO4	PO1

UNIT-V

9.	a)	List and explain the commonly used duct systems in air conditioning systems.	6 Marks	L2	CO5	PO1
	b)	What is Comfort chart? Analyze its use in designing air conditioning applications focused to human comfort.	6 Marks	L4	CO5	PO1
		(OR)				
10.	a)	Define EPR used in heat pump systems. Develop an Air to Air heat pump circuit for space heating application.	6 Marks	L3	CO5	PO1
	b)	Explain the humidification process by evaporating the water and air washing methods.	6 Marks	L2	CO5	PO1

CODE No.: 19BT60317 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

HYDRAULICS AND PNEUMATICS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Define pump and state the purpose of the pump in hydraulic system and classify pumps.	6 Marks	L2	CO1	PO1
	b)	Explain the working of Lobe pump with suitable sketch.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Sketch and explain the constructional feature of poppet relief valve.	6 Marks	L2	CO1	PO1
	b)	Explain the construction and working of following with neat sketch Double acting cylinder.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Sketch & explain Check valve.	6 Marks	L2	CO2	PO1
	b)	Explain Bleed-off circuit in detail.	6 Marks	L2	CO2	PO1
		(OR)				
4.		List and explain the components used in the hydraulic system, mention any six.	12 Marks	L2	CO2	PO1
		UNIT-III				
5.		Sketch and explain the Safety relief valve in detail.	12 Marks	L2	CO3	PO1
		(OR)				
6.		State the difference between pressure relief valve and sequence valve in detail.	12 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	What in 4/3 DCV? Explain with neat sketch.	6 Marks	L2	CO4	PO1
	b)	Explain with neat sketch Non-Return Valve.	6 Marks	L2	CO4	PO1
		(OR)				
8.	a)	Explain construction & working of the single acting cylinder.	6 Marks	L2	CO4	PO1
	b)	Explain with a neat sketch of an air pilot control circuit for a double acting actuator.	6 Marks	L2	CO4	PO1
		UNIT-V				
9.		Explain in detail about Pneumatic valve functions with neat sketches.	12 Marks	L2	CO4	PO1
		(OR)				
10.		Describe an example of Pneumatic Cylinder sequencing circuit using logic gates.	12 Marks	L2	CO4	PO1 PO2 PO3

CODE No.: 19BT60318 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

INDUSTRIAL INTERNET OF THINGS

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Describe IIOT architecture.	6 Marks	L2	CO1	PO1 PO5
	b)	Demonstrate Functional and Informational views.	6 Marks	L2	CO1	PO1 PO5
		(OR)				
2.	a)	Illustrate Deployment and Operational Views.	6 Marks	L2	CO1	PO1 PO2 PO5
	b)	Enumerate IOT domestic applications.	6 Marks	L2	CO1	PO1 PO2 PO5
		UNIT-II				
3.	a)	What is the main objective of IIoT in manufacturing and other industrial process?	6 Marks	L2	CO2	PO1 PO5
	b)	Illustrate Wireless Communication Technologies.	6 Marks	L2	CO2	PO1 PO5
		(OR)				
4.	a)	Discuss Proximity Network and WSN Edge Node.	6 Marks	L2	CO2	PO1 PO5
	b)	Describe Legacy Industrial and Modern Communication Protocols.	6 Marks	L2	CO2	PO1 PO5
		UNIT-III				
5.	a)	Enlist the benefits of adopting an Industry 4.0 model.	6 Marks	L2	CO3	PO1 PO2
	b)	Explain Four Main Characteristics of Industry 4.0.	6 Marks	L2	CO3	PO1 PO2
		(OR)				
6.		Explain Real-World Smart Factories and through some light on strategies and technical know-how it is involved in it.	12 Marks	L2	CO3	PO1 PO6
		UNIT-IV				
7.	a)	Compare in detail the OneM2M IoT Architecture and IoTWF standardized reference model.	6 Marks	L2	CO4	PO1 PO8
	b)	Differentiate IoT and M2M.	6 Marks	L2	CO4	PO1 PO8
		(OR)				
8.	a)	Explain the constructional features of Identity Access Management.	6 Marks	L2	CO4	PO1 PO2
	b)	Differentiate between PLCs and DCS.	6 Marks	L2	CO4	PO1 PO2
		UNIT-V				

9.	Discuss the following in detail: i) SOCRADES ii) IMC-AESOP.	12Marks	L2	CO5	PO1 PO5
	(OR)				
10.	Illustrate Service-oriented architecture and explain device integration.	12Marks	L2	CO5	PO1 PO5

CODE No.: 19BT60320 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

MECHATRONICS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

	UNIT-I				
1.	Differentiate between traditional system and mechatronics system with an example.	12 Marks	L2	CO1	PO1 PO2
	(OR)				
2.	Explain automatic camera with a neat sketch.	12 Marks	L2	CO1	PO1 PO2
	UNIT-II				
3.	Explain the basic elements of hydraulic system with a neat sketch and write the advantages and disadvantages of hydraulic system.	12 Marks	L2	CO2	PO1 PO2
	(OR)				
4.	Illustrate the construction and working of single acting and double acting cylinder with a neat sketch.	12 Marks	L2	CO2	PO1 PO2
	UNIT-III				
5.	Explain simple and compound gear train and illustrate their gear ratios.	12 Marks	L2	CO3	PO1 PO2
	(OR)				
6.	What is stepper motor? Explain the types of stepper motor with a neat sketch.	12 Marks	L2	CO3	PO1 PO2
	UNIT-IV				
7.	Explain the dynamic characteristics of sensors.	12 Marks	L2	CO4	PO1 PO2
	(OR)				
8.	Explain Hall effect sensor with integration of analog and digital controllers.	12 Marks	L2	CO4	PO1 PO2
	UNIT-V				
9.	Describe the procedure of Digital to Analog (D/A) conversion with a sketch. Explain any one type of D/A converter in detail.	12 Marks	L2	CO5	PO1 PO2
	(OR)				
10.	Compare the characteristics of i) proportional control, ii) proportional plus integral control, iii) proportional plus integral plus derivative control.	12 Marks	L2	CO5	PO1 PO2

CODE No.: 19BT60401 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

ANTENNAS AND PROPAGATION

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Define the terms directivity and gain. State the relation between gain of the antenna and the antenna aperture.	6 Marks	L3	CO1	PO1
	b)	Find the radiation resistance of a Hertzian dipole of length λ/40, λ/60, λ/80.	6 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Explain the current distribution in thin linear wire antenna.	6 Marks	L2	CO1	PO3
	b)	Define radiation resistance and determine the radiation resistance of antenna which is drawing 15 Ampere and radiating power 5 kW.	6 Marks	L3	CO1	PO1
		UNIT-II				
3.	a)	Consider a two point sources element array separated a distance "d". Determine the total far field E for the given array.	6 Marks	L3	CO2	PO3
	b)	An end fire array composed of λ/2 radiators with axes at right angles to the line of the array is required to have a power gain of 20. Determine the array length and the width of a major lobe between the nulls.	6 Marks	L2	CO2	PO2
		(OR)				
4.	a)	A uniform linear array consists of 16 isotropic sources with a spacing of λ/2. If the phase difference (φ) is -45^0. Determine HPBW, directivity and effective aperture.	6 Marks	L2	CO2	PO3
	b)	Discuss the conditions under which an array of antenna will behave either as a broadside array or an end fire array.	6 Marks	L3	CO2	PO2
		UNIT-III				
5.	a)	Narrate in detail about Cassegrain feed of a parabolic reflector.	6 Marks	L2	CO1	PO1
	b)	Give the equations for the effective length and effective width of the microstrip patch antenna and list the limitations of microstrip antennas.	6 Marks	L2	CO1	PO2
		(OR)				
6.	a)	With neat diagram, explain the helical antenna and briefly describe its operation in normal mode.	6 Marks	L3	CO1	PO1
	b)	Explain the Horn antenna. How this antenna fed and what is its application?	6 Marks	L2	CO1	PO2
		UNIT-IV				
7.	a)	Describe the methods for measuring the gain and half power beam width of an antenna.	6 Marks	L2	CO3	PO2
	b)	How the far field pattern of a receiving antenna experimentally determined? Explain with a neat block diagram.	6 Marks	L3	CO3	PO5
		(OR)				

8.	a)	With neat setup, explain the absolute method of measuring the gain of the antenna.	6 Marks	L3	CO3	PO2
	b)	Explain the first transmission formula and its applicability for antenna gain measurement.	6 Marks	L2	CO3	PO2

UNIT-V

9.	a)	Explain in detail the mechanism of space wave propagation with a neat sketch.	6 Marks	L2	CO4	PO2
	b)	Assume the reflection takes place at height of 400km and that the maximum density in the ionosphere corresponds to a 0.9 refractive index at 10MHz. What will be the range for flat earth condition for which the MUF is 10 MHz.	6 Marks	L3	CO4	PO2

(OR)

10.	a)	Write a short note on Collison frequency in the ionosphere.	6 Marks	L2	CO4	PO1
	b)	Explain briefly the terms Ray Path, Critical frequency and virtual height as used in ionospheric propagation.	6 Marks	L2	CO4	PO1

CODE No.: 19BT60402 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

MICROCONTROLLERS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain bit manipulation instructions of 8051 with sufficient examples.	6 Marks	L1	CO1	PO1
	b)	Develop an assembly language program to convert a packed BCD to ASCII code.	6 Marks	L4	CO1	PO2
		(OR)				
2.	a)	Demonstrate counter operation in 8051.	6 Marks	L2	CO1	PO1
	b)	Differentiate 8051 and PIC microcontroller.	6 Marks	L4	CO1	PO2
		UNIT-II				
3.	a)	Draw neat block diagram of PIC18 controller and explain architecture.	6 Marks	L1	CO2	PO1
	b)	Identify the role of W register and illustrate the instructions that use W register.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Predict how status register helps the programmer to model conditions while composing software for PIC18 based products.	6 Marks	L1	CO2	PO1
	b)	Demonstrate the assembler directives used in PIC microcontroller programming.	6 Marks	L3	CO2	PO2
		UNIT-III				
5.	a)	With neat internal circuit diagram port pin of PIC18, describe data writing operation.	6 Marks	L2	CO3	PO2
	b)	Write an assembly language program for the PIC18 microcontroller to toggle all the bits of PORTB, PORTC and PORTD every ¼ of a second. Assume crystal frequency is 4MHz.	6 Marks	L4	CO3	PO3
		(OR)				
6.	a)	Summarize timer related SFRs and present steps to program timer 0 in 16 bit mode of PIC18.	6 Marks	L4	CO3	PO3
	b)	Write an assembly language program to generate a square wave of 40KHz on PORTB.5. Assume crystal frequency is 10MHz.	6 Marks	L4	CO3	PO3
		UNIT-IV				
7.	a)	Describe the interrupt handling mechanism of PIC18 microcontroller.	6 Marks	L2	CO4	PO1
	b)	Write a C code for PIC18 microcontroller to transfer serially the message “SVEC skilling the young minds to achieve unparallel brilliance”	6 Marks	L4	CO4	PO3
		(OR)				
8.	a)	Compare interrupt and polling methods of microcontroller programming to servicing the peripherals.	6 Marks	L3	CO4	PO6
	b)	Write a C code for PIC18 to illustrate external hardware interrupt programming.	6 Marks	L4	CO4	PO3

UNIT-V

9.	a)	Write a C code for PIC18 microcontroller to display the following data on LCD. First line: "Sree Vidhyanikethan" Second line: "Engineering College"	6 Marks	L4	CO4	PO3
	b)	Assess the role of Key de-bouncing routine while interfacing keyboard. Roll out the implementation routine for PIC18.	6 Marks	L4	CO4	PO6
		(OR)				
10.	a)	Plan connections to interface ADC0848 to PIC18 and code it to acquire all 8 channels with time delay 250 msec between each acquisition.	6 Marks	L3	CO4	PO8
	b)	Write a C code for PIC18 to monitor switch, which is connected to RD7, and perform the following: i) If SW=0, the DC motor moves with 50% duty cycle pulse ii) If SW=1, the DC motor moves with 25% duty cycle pulse.	6 Marks	L4	CO4	PO3

CODE No.: 19BT60405 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

DIGITAL IC DESIGN

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Draw and describe the transfer characteristics of CMOS inverter.	6 Marks	L3	CO1	PO1
	b)	Distinguish between static and dynamic power dissipations in CMOS circuits.	6 Marks	L4	CO1	PO3
		(OR)				
2.	a)	What is domino logic?	6 Marks	L3	C02	PO2
	b)	How to minimize power consumption in CMOS gates?	6 Marks	L4	C02	PO4
		UNIT-II				
3.	a)	How to implement pipelined structures?	6 Marks	L3	CO2	PO1
	b)	Distinguish static and dynamic sequential circuits.	6 Marks	L4	C03	PO2
		(OR)				
4.	a)	What is clock skew and how to minimize it?	6 Marks	L2	CO2	PO1
	b)	How to synchronize clock in digital circuits?	6 Marks	L1	CO2	PO2
		UNIT-III				
5.	a)	Define logical effort.	6 Marks	L3	CO2	PO3
	b)	Determine the effect of transistor sizing on logical effort.	6 Marks	L4	CO2	PO3
		(OR)				
6.	a)	How to design low power CMOS circuits?	6 Marks	L4	CO1	PO2
	b)	Draw and explain DRAM cell.	6 Marks	L4	CO3	PO1
		UNIT-IV				
7.	a)	What is meant by subsystem design?	6 Marks	L2	CO1	PO1
	b)	Describe the operation of 4 bit shifter.	6 Marks	L1	CO1	PO2
		(OR)				
8.	a)	Explain modified Booth's algorithm.	6 Marks	L3	CO2	PO3
	b)	Implement ALU functions with adder.	6 Marks	L4	CO2	PO3
		UNIT-V				
9.	a)	What is structured design?	6 Marks	L3	CO4	PO4
	b)	Write short note on design methods.	6 Marks	L2	CO4	PO4
		(OR)				
10.	a)	Describe design flow.	6 Marks	L2	CO4	PO4
	b)	Write short note on design economics.	6 Marks	L2	CO4	PO4

CODE No.: 19BT60406 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

SATELLITE COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Derive an expression for the velocity of a satellite at its perigee and apogee in terms of semi major axis and eccentricity of earth.	6 Marks	L1	CO1	PO1
	b)	An earth station is located at latitude of 35º N and longitude of 65º E. calculate the antenna look angle for the satellite at 156º E.	6 Marks	L1	CO1	PO4
		(OR)				
2.	a)	What are look angles? With the help of suitable mathematical expressions, explain how elevation and azimuth angles are calculated.	6 Marks	L3	CO1	PO2
	b)	The earth rotates once per sidereal day of 23h 56 min 4.09s. Show that the radius of GEO is 42,164.17 km.	6 Marks	L4	CO1	PO2
		UNIT-II				
3.	a)	Derive the expressions for system noise temperature and G/T ratio for earth stations.	6 Marks	L2	CO2	PO1
	b)	Explain in detail about tracking subsystem with neat block diagram.	6 Marks	L1	CO2	PO3
		(OR)				
4.	a)	Explain the working of telemetry tracking and control with a suitable diagram.	6 Marks	L2	CO2	PO8
	b)	For a satellite circuit the individual link carrier-to-noise spectral density ratios are:uplink 100 dB Hz; Downlink: 87 dB Hz. Calculate the combined U/No ratio.	6 Marks	L3	CO2	PO2
		UNIT-III				
5.	a)	What are the advantages of CDMA over TDMA?	6 Marks	L2	CO3	PO1
	b)	With the help of block diagram, explain how CDMA is used for satellite communication.	6 Marks	L1	CO3	PO5
		(OR)				
6.	a)	Explain the spread spectrum transmission and reception.	6 Marks	L2	CO3	PO5
	b)	What are different antennas used on satellites? Explain with the help of typical satellite antenna patterns and coverage zones.	6 Marks	L1	CO3	PO2
		UNIT-IV				
7.	a)	Which factors influences the design of any satellite communication systems? Explain.	6 Marks	L3	CO4	PO1
	b)	Explain Delay and Throughput considerations for typical LEO, MEO and GEO systems.	6 Marks	L1	CO4	PO2
		(OR)				
8.	a)	Explain the terminal characteristics and common requirements of NGSO.	6 Marks	L2	CO4	PO1
	b)	Discuss the following NGSO (Non Geo Stationary Orbit) Constellation designs: i) Global star. ii) Teledesic.	6 Marks	L4	CO4	PO6

UNIT-V

9.	a)	Define Geodesy and Time Systems of NAVIC.	6 Marks	L1	CO5	PO1
	b)	Find the maximum Doppler shift of the L1 signal frequency for a GPS satellite has an elevation angle of 10^{o}.	6 Marks	L3	CO5	PO7
		(OR)				
10.	a)	Explain NAVIC space segment in detail.	6 Marks	L1	CO5	PO2
	b)	Explain the following satellite applications. i) GPS. ii) Satellite Navigational system.	6 Marks	L2	CO5	PO6

CODE No.: 19BT60407 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

IMAGE PROCESSING

[Electrical and Electronics Engineering, Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Summarize various distance functions applied to digital images.	6 Marks	L1	CO1	PO1
	b)	Discuss the properties of Discrete cosine Transform	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Demonstrate the process of converting analog images to digital images.	6 Marks	L3	CO1	PO4
	b)	Discuss Walsh Transform with suitable equations.	6 Marks	L2	CO1	PO5
		UNIT-II				
3.	a)	Contrast between mean and median filters for restoring images in the presence of Gaussian noise.	6 Marks	L1	CO2	PO2
	b)	What is Homomorphic filtering? Explain in detail	6 Marks	L1	CO2	PO2
		(OR)				
4.	a)	What are image sharpening filters? Explain the various types of it.	6 Marks	L2	CO2	PO1
	b)	Discuss the image smoothing filter with its model in the spatial domain.	6 Marks	L2	CO2	PO5
		UNIT-III				
5.	a)	Compare the two morphological operations Erosion and Dilation.	6 Marks	L2	CO3	PO2
	b)	What is meant by Inverse filtering? Explain.	6 Marks	L1	CO3	PO4
		(OR)				
6.	a)	Discuss about Constrained Least square restoration for a digital image in detail.	6 Marks	L2	CO3	PO1
	b)	What are the two approaches for blind image restoration? Explain in detail.	6 Marks	L1	CO3	PO3
		UNIT-IV				
7.	a)	What is data redundancy? Explain three basic data redundancy.	6 Marks	L2	CO4	PO1
	b)	Explain run length coding with an example.	6 Marks	L2	CO4	PO2
		(OR)				
8.	a)	Demonstrate the Error free Compression with relevant equations.	6 Marks	L2	CO4	PO5
	b)	What are the operations performed by error free compression?	6 Marks	L1	CO4	PO3
		UNIT-V				
9.	a)	Explain Boundary descriptors in detail with a neat diagram.	6 Marks	L1	CO5	PO2
	b)	How is line detected? Explain through the operators.	6 Marks	L2	CO6	PO5
		(OR)				
10.	a)	Describe the HSI color image model.	6 Marks	L2	CO5	PO2
	b)	Explain different edge detection operators and compare them.	6 Marks	L1	CO6	PO2

❀ ❀ ❀

CODE No.: 19BT60408 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

NANOSTRUCTURES AND NANOTECHNOLOGY

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Compare the various dimension of nanomaterials.	4 Marks	L1	CO1	PO1
	b)	Classify the NSM and discuss their chemical composition and the dimensionality with neat diagram.	8 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Write about the significance of specific surface area of nanomaterials.	4 Marks	L1	CO1	PO2
	b)	Discuss the Grain boundaries effects on NSM.	8 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	Compare and contrast SEM and TEM.	6 Marks	L1	CO2	PO1
	b)	Describe the working functions of Laser induced electronic spectroscopy.	6 Marks	L2	CO2	PO2
		(OR)				
4.		Illustrate and discuss the X-ray Diffraction Intensity from a Polycrystalline Sample and derive the Bragga's Law.	12 Marks	L2	CO2	PO1
		UNIT-III				
5.		Elaborate the working principle, application and advantages of soft lithography.	12 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Explain the self-assemble method for preparation of nano wire/nanoparticles.	4 Marks	L1	CO3	PO1
	b)	Illustrate the schematic of the detailed lithographic process with necessary diagram.	8 Marks	L2	CO3	PO2
		UNIT-IV				
7.	a)	Describe the optical and electrical properties of nanotubes.	6 Marks	L1	CO4	PO1
	b)	Discuss the Gold Catalyst Preparation Methods with suitable examples.	6 Marks	L2	CO4	PO2
		(OR)				
8.		With help of neat diagram, explain the working of chemical vapor deposition.	12 Marks	L2	CO4	PO2
		UNIT-V				
9.	a)	Write short notes on nanobots.	6 Marks	L1	CO5	PO1
	b)	Discuss the Surface plasmon polaritons.	6 Marks	L2	CO5	PO2
		(OR)				
10.	a)	Discuss the anti-bacterial properties of various types of nanoparticle and its role in bio-nanotechnology.	6 Marks	L1	CO5	PO1
	b)	Summarize the various types of photochemical cell and its principle of operation.	6 Marks	L2	CO5	PO2

CODE No.: 19BT60409 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

TESTING AND TESTABILITY

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Draw and explain about equivalent fault collapsing for Boolean gates, wires, and fanouts.	6 Marks	L1	CO1	PO1
	b)	List and explain various levels of modelling.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Define Fault dominance and explain in detail with an example.	6 Marks	L2	CO1	PO1
	b)	Explain the modeling digital circuit at logical level.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Illustrate the functionality of series fault simulation.	6 Marks	L2	CO1	PO1
	b)	Give brief summary of different modeling levels and simulators.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Give the steps involved in Concurrent Fault Simulation with an example.	6 Marks	L1	CO1	PO1
	b)	What is fault sampling? And analyze its performance.	6 Marks	L2	CO2	PO2
		UNIT-III				
5.	a)	Mention the basic steps involved in implementing D-Algorithm with an example.	6 Marks	L1	CO2	PO1
	b)	Explain FAN Algorithm using combinational circuit.	6 Marks	L2	CO2	PO2
		(OR)				
6.	a)	Describe the process of PODEM algorithm with the help of high-level flow chart.	6 Marks	L2	CO2	PO2
	b)	Explain 9V algorithm with an example used for ATG.	6 Marks	L2	CO2	PO2
		UNIT-IV				
7.	a)	Explain IDDQ testing and motivation behind it.	6 Marks	L2	CO3	PO2
	b)	How responses are observed at rated clock speed using At-speed testing?	6 Marks	L3	CO3	PO2
		(OR)				
8.	a)	What is Delta IDDQ testing and what are the differences between IDQQ and Delta IDDQ testing procedures?	6 Marks	L1	CO3	PO1
	b)	What is the need for BIC testing? And draw the diagram of BIC sensor.	6 Marks	L2	CO3	PO1
		UNIT-V				
9.	a)	What are the design practices of ad-hoc DFT method?	6 Marks	L1	CO4	PO1
	b)	Discuss the concept of BSIT.	6 Marks	L1	CO4	PO1
		(OR)				
10.	a)	What are the steps involved in partial scan design?	6 Marks	L1	CO4	PO1
	b)	Explain the process of Test-per-Clock Scan BIST Systems.	6 Marks	L1	CO4	PO1

CODE No.: 19BT60501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

COMPILER DESIGN

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	With a neat sketch, explain the phases of compiler.	6 Marks	L2	CO1	PO1
	b)	Give the parse tree for the following while statement. while **A>B&A<=2*B-5** do **A:=A+B**.	6 Marks	L3	CO1	PO1
		(OR)				
2.	a)	Write the specification of YACC parser generator and explain with example.	6 Marks	L2	CO2	PO1
	b)	Explain Input buffering with example.	6 Marks	L2	CO2	PO1 PO2 PO3
		UNIT-II				
3.	a)	Define ambiguity. How to eliminate ambiguity explain with an example.	6 Marks	L3	CO3	PO1 PO2 PO3 PO4
	b)	Consider the grammar given below **E → E+E | E-E | E*E | E/E | a | b** Obtain leftmost and rightmost derivation trees and syntax trees for the string **a+b * a+b**.	6 Marks	L3	CO3	PO1 PO2 PO3 PO4
		(OR)				
4.	a)	Find the First and Follow sets for the following grammar. **E → TA** **A →+TA / ∈** **T → FB** **B → *FB / ∈** **F → (E) / id**	6 Marks	L3	CO3	PO1 PO2 PO3 PO4
	b)	Give the limitations of Recursive descent parser.	6 Marks	L2	CO3	PO1 PO2 PO3 PO4
		UNIT-III				
5.	a)	Give an example each for implicit and explicit type conversion.	6 Marks	L3	CO4	PO1 PO2
	b)	Define static checking. Give some examples of static checks.	6 Marks	L2	CO4	PO1 PO2
		(OR)				

6.	a)	Explain any two syntax directed translation. Explain applications of SDT's.	6 Marks	L2	CO4	PO1 PO2
	b)	Consider the CFG for a desk calculator. **S →E$ E → E+E|E-E|E*E|E/E|(E)|id** i) Write the semantic actions and Program fragment for the above grammar. ii) Construct the parse tree for the evaluation of the expression **23*5 + 4**.	6 Marks	L3	CO4	PO1 PO2
		UNIT-IV				
7.	a)	Compare various forms of three address code.	6 Marks	L2	CO4	PO1 PO2
	b)	Convert the following arithmetic expression into syntax tree and three address code $b* - (a + b)$.	6 Marks	L3	CO4	PO1 PO2
		(OR)				
8.	a)	Write a syntax directed definition to convert the given binary number with its decimal equivalent.	6 Marks	L3	CO4	PO1 PO2
	b)	Explain the usage of search tree in implementing symbol table.	6 Marks	L2	CO4	PO1 PO2
		UNIT-V				
9.	a)	What are the issues in code generation process? Explain in detail.	6 Marks	L2	CO5	PO1 PO2
	b)	Design an algorithm for code generation from three address code.	6 Marks	L3	CO5	PO1 PO2
		(OR)				
10.	a)	Elaborate on various function preserving techniques of loop optimization in code optimization phase.	6 Marks	L3	CO5	PO1 PO2
	b)	Identify different object code forms in code generation phase and explain them.	6 Marks	L3	CO5	PO1 PO2

CODE No.: 19BT60502 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

MACHINE LEARNING

[Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Discuss Concept learning as search with respect to General to specific ordering of hypothesis. — 6 Marks L2 CO1 PO1

   b) Illustrate Find S Algorithm over the Training instances given below. — 6 Marks L4 CO4 PO4

EXAMPLE	COLOR	TOUGHNESS	FUNGUS	APPEARANCE	POISONOUS
1.	GREEN	HARD	NO	WRINKELD	YES
2.	GREEN	HARD	YES	SMOOTH	NO
3.	BROWN	SOFT	NO	WRINKLED	NO
4.	ORANGE	HARD	NO	WRINKLED	YES
5.	GREEN	SOFT	YES	SMOOTH	YES
6.	GREEN	HARD	YES	WRINKLED	YES
7.	ORANGE	HARD	NO	WRINKLED	YES

(OR)

2. a) Apply candidate elimination algorithm to obtain the final version space. — 6 Marks L4 CO3 PO4

Sky	Temperature	Humid	Wind	Water	Forest	Output
sunny	warm	normal	strong	warm	same	yes
sunny	warm	high	strong	warm	same	yes
rainy	cold	high	strong	warm	change	no
sunny	warm	high	strong	cool	change	yes

   b) Explain perspectives and issues in machine learning. — 6 Marks L2 CO1 PO1

UNIT-II

3. a) Describe the following with examples: — 6 Marks L2 CO2 PO1
      i) Hypothesis space search.
      ii) Decision tree learning.
      iii) Version Space.

   b) Discuss the issues involved in decision tree learning. — 6 Marks L2 CO2 PO1

(OR)

4. a) Differentiate between supervised and unsupervised training with suitable examples. — 6 Marks L2 CO2 PO2

   b) Construct Decision trees to represent the Boolean Functions for the example. — 6 Marks L4 CO3 PO4
   (Day=Weekday ^ Discount=Given) V (Day=Weekend) V (Day= Holiday ^ Purchase=Yes)

UNIT-III

5.	a)	Discuss various types of problems in which Artificial Neural Network can be applied.	6 Marks	L2	CO4	PO1
	b)	Illustrate Bayesian belief network and conditional independence with example.	6 Marks	L2	CO4	PO1
		(OR)				
6.	a)	Derive the Back propagation rule considering the training rule for Output Unit weights and Training Rule for Hidden Unit weights.	6 Marks	L3	CO4	PO2
	b)	Describe Maximum Likelihood Hypothesis for predicting probabilities.	6 Marks	L2	CO4	PO1

UNIT-IV

7.	a)	Explain the concept of Bayes theorem with an example.	6 Marks	L2	CO2	PO1
	b)	Describe the concept of MDL.	6 Marks	L2	CO2	PO1
		(OR)				
8.	a)	Discuss the following: i) Prior Probability. ii) Conditional Probability. iii) Posterior Probability.	6 Marks	L2	CO2	PO1
	b)	Prove that how maximum likelihood (Bayesian learning) can be used in any learning algorithms that are used to minimize the squared error between actual output hypotheses and predicted output hypothesis.	6 Marks	L3	CO2	PO2

UNIT-V

9.	a)	Describe k-Nearest Neighbor learning in detail.	6 Marks	L2	CO2	PO1
	b)	Explain CADET System using Case based reasoning.	6 Marks	L2	CO2	PO1
		(OR)				
10.	a)	Explain Q learning algorithm assuming deterministic rewards and actions.	6 Marks	L2	CO2	PO1
	b)	How reinforcement learning problems differs from other function approximation tasks?	6 Marks	L2	CO2	PO2

CODE No.: 19BT60503 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

CRYPTOGRAPHY AND NETWORK SECURITY

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	List out and explain Essential Network and Computer Security Requirements.	6 Marks	L1	CO1	PO2
	b)	Differentiate between secret-key encryption and public-key encryption.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Explain briefly passive and active security attacks.	6 Marks	L1	CO1	PO3
	b)	Differences between a monoalphabetic cipher and a polyalphabetic cipher and justify why polyalphabetic is more secure than monoalphabetic.	6 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	Explain in detail Data Encryption Standard with example.	6 Marks	L1	CO1	PO1
	b)	List and explain Block cipher design principles.	6 Marks	L1	CO1	PO2
		(OR)				
4.	a)	Compare stream ciphers and block ciphers.	6 Marks	L2	CO1	PO4
	b)	Explain Decryption process in AES.	6 Marks	L1	CO1	PO1
		UNIT-III				
5.	a)	Differentiate Conventional and Public-Key Encryption.	6 Marks	L2	CO2	PO1
	b)	List and explain message authentication requirements.	6 Marks	L2	CO2	PO2
		(OR)				
6.	a)	Explain in detail about encryption and decryption of process RSA.	6 Marks	L2	CO2	PO2
	b)	Outline and explain in detail the two approaches of Digital signature.	6 Marks	L2	CO2	PO2
		UNIT-IV				
7.	a)	List four general categories of schemes for the distribution of public keys.	6 Marks	L2	CO3	PO1
	b)	Explain in detail about : i) Public announcement in public keys. ii) Publicly available directory.	6 Marks	L2	CO3	PO2
		(OR)				
8.	a)	Describe X.509 Certificate formats and fields.	6 Marks	L2	CO3	PO3
	b)	How does remote user authentication principles helps to adapt Authentication and security polices? Justify.	6 Marks	L4	CO3	PO3
		UNIT-V				
9.	a)	List out various types of MIME.	6 Marks	L2	CO4	PO1
	b)	Discuss authentication, header and ESP in detail with their packet format.	6 Marks	L2	CO4	PO2
		(OR)				
10.	a)	Explain in detail about the security services (PGP, S/MIME) for E-mail.	6 Marks	L2	CO4	PO2
	b)	List and briefly explain four principal services provided by S/MIME.	6 Marks	L2	CO4	PO2

CODE No.: 19BT60503 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

CRYPTOGRAPHY AND NETWORK SECURITY

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the various active attacks. What security mechanisms are suggested to counter attack active attacks?	6 Marks	L2	CO1	PO2
	b)	Discuss any four Substitution Technique and list their merits and demerits.	6 Marks	L2	CO1	PO1 PO2
		(OR)				
2.	a)	Explain the operations, requirements, components of Network security model.	6 Marks	L2	CO1	PO1 PO4
	b)	Generate Cipher text for the plain text "Welcome to the Lab" using the Mono-alphabetic ciphering technique with key "craft".	6 Marks	L2	CO1	PO1 PO2
		UNIT-II				
3.	a)	Draw the general structure of DES. Explain the encryption and decryption process.	6 Marks	L2	CO1	PO1 PO2
	b)	Briefly discuss about Stream cipher principles.	6 Marks	L2	CO1	PO1 PO2
		(OR)				
4.	a)	Describe Triple DES and its applications.	6 Marks	L2	CO2	PO1 PO4
	b)	Write a note on Block Cipher Design Principles.	6 Marks	L2	CO2	PO1 PO4
		UNIT-III				
5.	a)	Given p=19, q=23, and e=3 Use RSA algorithm to find n, $\phi(n)$ and d.	6 Marks	L3	CO3	PO2 PO4
	b)	What characteristics are needed in secure hash function? Write about the security of hash functions and MACs.	6 Marks	L2	CO3	PO1 PO2
		(OR)				
6.	a)	Briefly explain the Diffie Hellman Key Exchange algorithm.	6 Marks	L2	CO2	PO1 PO2
	b)	Illustrate in detail about the message authentication code and its requirements.	6 Marks	L3	CO2	PO1 PO2
		UNIT-IV				
7.	a)	What are the environmental shortcomings of Kerberos4? How does Kerberos 5 address them?	6 Marks	L2	CO3	PO1 PO2
	b)	How does a remote user authentication principle helps to adapt Authentication and security polices? justify?	6 Marks	L4	CO3	PO1 PO2
		(OR)				
8.	a)	Give a brief notes on X.509 authentication services.	6 Marks	L2	CO3	PO1 PO2
	b)	Compare symmetric key distribution using symmetric and asymmetric encryption techniques.	6 Marks	L2	CO3	PO1 PO2

UNIT-V

9.	a)	Give the structure of PGP message generation. Explain with a diagram.	6 Marks	L2	CO4	PO1 PO2
	b)	Explain IP Security protocols in detail.	6 Marks	L2	CO4	PO1 PO2
		(OR)				
10.	a)	Give the summary of cryptographic algorithms used by S/MIME.	6 Marks	L2	CO4	PO1 PO2
	b)	Explain the web security considerations for transport level security.	6 Marks	L2	CO4	PO1 PO2

CODE No.: 19BT60504 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

FULL STACK DEVELOPMENT

[Information Technology]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Demonstrate the selectors in jQuery, and mention the types of Selectors.	6 Marks	L3	CO1	PO1
	b)	Identify the effects methods used in jQuery and describe any 3 of them.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Construct a jQuery program using change() and submit() functions.	6 Marks	L3	CO1	PO2
	b)	Develop a jQuery program to set the background color to <p> tag using $().	6 Marks	L3	CO1	PO2
		UNIT-II				
3.	a)	Show the steps to Create the collection, print the documents in reverse order / descending order. student = ([{ S.No: 10, Name: "BHARAT" }, { S.No: 7, Name: "SITA" }, { S.No: 9, Name: "RAMA" }].	6 Marks	L2	CO2	PO2
	b)	Explain Projection and how to use projection in Mongo DB.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Illustrate the following methods with syntax. Limit( ) Skip( ) Pretty( )	6 Marks	L3	CO2	PO1
	b)	Prepare the commands for the following: Inserting multiple documents at a time into Collection Dropping a Collection and Database	6 Marks	L3	CO2	PO3
		UNIT-III				
5.	a)	Develop a Nodejs program to generate 8-digit OTP number.	8 Marks	L3	CO3	PO3
	b)	Explain about asynchronous programming with call back functions in NodeJs.	4 Marks	L2	CO3	PO4
		(OR)				
6.	a)	Implement a NodeJs program to create the document in Mongo database.	6 Marks	L4	CO3	PO4
	b)	Implement a NodeJs program to read 10 numbers from command line and display the numbers.	6 Marks	L3	CO3	PO2
		UNIT-IV				
7.	a)	Demonstrate mongo database connectivity using express to insert the following details into student collection? Student name, studentID, student Dept.	8 Marks	L2	CO4	PO5
	b)	Explain any three core functions of express it's features.	4 Marks	L2	CO4	PO1

(OR)

8.	a)	Establish the router configuration using GET request to display "welcome to endsem exam" message on browser in express.	6 Marks	L3	CO4	PO1
	b)	Demonstrate Mongo DB connectivity using express by fetching the data from the collection 'Student'.	6 Marks	L2	CO4	PO2

UNIT-V

9.	a)	Illustrate the process of data transfer from parent to child component and child to parent component.	6 Marks	L3	CO5	PO1
	b)	Describe the following with examples (i) Transpiller (ii) Single page application and how they work in angular.	6 Marks	L1	CO5	PO3

(OR)

10.	a)	Create three components student, faculty, admin. When the user gives the url '/student' it should display "hello iam student"? When the user gives the url '/faculty' it should display "hello students" and repeat same for admin as well write ts files and routing file?	6 Marks	L3	CO5	PO2
	b)	Demonstrate the usage of 'ngFor' for displaying all 10 items (create a array of 10 items) from on array "items" in a list.	6 Marks	L3	CO5	PO1

CODE No.: 19BT60505 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

SOFT COMPUTING

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Describe the application and scope of neural networks.	6 Marks	L2	CO1	PO1
	b)	Compare biological neuron and artificial neuron.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Explain the concept of Back Propagation Learning.	6 Marks	L2	CO1	PO1
	b)	Write a note on Augmented Back Propagation Networks.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	State the activation function used in perceptron network.	6 Marks	L3	CO2	PO1 PO2 PO3 PO4
	b)	Explain the testing algorithm for back propagation network.	6 Marks	L2	CO2	PO1 PO2 PO3 PO4
		(OR)				
4.	a)	Compare feed forward and feedback network.	6 Marks	L2	CO2	PO1 PO2 PO3 PO4
	b)	Describe the factors that improve the convergence of learning in back propagation network.	6 Marks	L3	CO2	PO1 PO2 PO3 PO4
		UNIT-III				
5.	a)	Implement AND function using perceptron networks for bipolar inputs and targets.	6 Marks	L3	CO3	PO1 PO2
	b)	With architecture, describe how LVQ nets are trained.	6 Marks	L3	CO3	PO1 PO2
		(OR)				
6.	a)	With neat architecture, explain the training algorithm of Kohonen's Self-Organizing feature maps.	6 Marks	L3	CO3	PO1 PO2
	b)	State the merits and demerits of Kohonen self-organizing feature map.	6 Marks	L3	CO3	PO1 PO2
		UNIT-IV				
7.	a)	What is the cardinality of a fuzzy set? Whether a power set can be formed for a fuzzy set?	6 Marks	L2	CO4	PO1 PO2
	b)	List the properties of classical sets.	6 Marks	L2	CO4	PO1 PO2
		(OR)				

8.	a)	Explain the fuzzy sets operations using Venn diagram.	6 Marks	L2	CO4	PO1 PO2
	b)	Identify the importance of fuzzy sets and its application in engineering sector.	6 Marks	L2	CO4	PO1 PO2

UNIT-V

9.	a)	How are necessity and possibility measures obtained from belief and plausibility?	6 Marks	L2	CO5	PO1 PO2 PO3
	b)	How is an interval analysis obtained in fuzzy arithmetic? Explain.	6 Marks	L2	CO5	PO1 PO2 PO3

(OR)

10.	a)	Given the two intervals $\underline{E}$ = [2, 4], $\underline{F}$ = [4, -5], find the max and min operations over these intervals.	6 Marks	L3	CO5	PO1 PO2 PO3
	b)	Compare and contrast traditional algorithm and genetic algorithm.	6 Marks	L2	CO5	PO1 PO2 PO3

CODE No.: 19BT60541 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

AD HOC AND WIRELESS SENSOR NETWORKS

[Information Technology]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain about the electromagnetic spectrum.	6 Marks	L2	CO1	PO2
	b)	Differentiate cellular Networks and Ad hoc Wireless Networks.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	List the major advantages of Ad hoc Wireless Internet.	6 Marks	L2	CO4	PO6
	b)	Describe the various characteristics of the wireless channel.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Compare and Contrast Various Contention Protocols.	6 Marks	L3	CO2	PO2
	b)	Write the major issues that are taken into consideration for designing a MAC protocol.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	How Power consumption effects routing? Analyze the problem with an example.	6 Marks	L2	CO2	PO2
	b)	Illustrate hidden and exposed terminals with clear diagrams.	6 Marks	L4	CO2	PO1
		UNIT-III				
5.	a)	Apply On Demand Routing Protocols to find out Minimal path in Ad hoc Networks.	6 Marks	L3	CO2	PO3
	b)	Discuss in detail hybrid routing protocols.	6 Marks	L2	CO2	PO1
		(OR)				
6.	a)	Comment on Table driven routing protocols could be advantageous or disadvantageous as far as routing of networks in considered.	6 Marks	L1	CO2	PO3
	b)	Write the issues in designing a transport layer protocol for adhoc wireless networks.	6 Marks	L2	CO2	PO2
		UNIT-IV				
7.		With a neat sketch, discuss in detail about sensor network architecture.	12 Marks	L2	CO1	PO1
		(OR)				
8.	a)	Write the applications of Sensor Networks.	6 Marks	L2	CO1	PO1
	b)	Discuss energy consumption of sensor nodes.	6 Marks	L2	CO1	PO1
		UNIT-V				
9.	a)	Write a short on IEEE 802.15.4 MAC protocol.	6 Marks	L2	CO4	PO6
	b)	Discuss the concept of Bluetooth.	6 Marks	L2	CO4	PO6
		(OR)				
10.	a)	Explain Reliable MASN communication protocols.	6 Marks	L2	CO3	PO2
	b)	Write short notes on Schedule based protocols.	6 Marks	L1	CO3	PO2

CODE No.: 19BT61001 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

PROCESS CONTROL INSTRUMENTATION

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

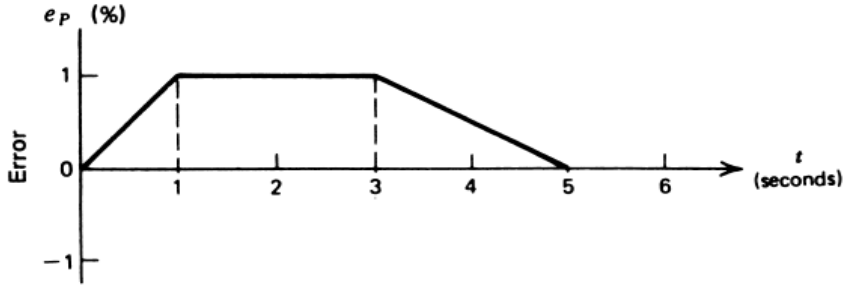
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	List the applications of process control.	6 Marks	L1	CO1	PO1
	b)	Determine the transfer function of a first order thermal system with necessary assumptions.	6 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Give the characteristics of liquid and gas system.	8 Marks	L2	CO1	PO1
	b)	What is self-regulation? List the advantages of self-regulation.	4 Marks	L1	CO1	PO1

UNIT-II

3.	a)	Explain the floating control mode in detail.	6 Marks	L2	CO2	PO3
	b)	Summarize the characteristics of the derivate mode.	6 Marks	L2	CO2	PO3
		(OR)				
4.	a)	Draw the output of a PD controller as a function of time for given error signal shown in figure. Assume that the Proportional gain $K_p = 5$, Derivative gain $K_D = 0.5$ sec and $p_o = 20\%$.	6 Marks	L3	CO2	PO4



	b)	Explain the working of pneumatic proportional controller with neat diagram.	6 Marks	L2	CO2	PO3

UNIT-III

5.	a)	Describe the ¼ decay ratio, IAE, ISE and ITAE performance criteria of controller settings.	6 Marks	L1	CO2	PO3
	b)	Discuss the procedure for setting controller parameters using frequency response method.	6 Marks	L2	CO2	PO4
		(OR)				
6.		Describe the controller tuning procedure in Cohen-Coon method.	12 Marks	L1	CO2	PO2

UNIT-IV

7.	a)	Sketch a pneumatic spring type actuator, label its parts and explain its working principle.	6 Marks	L3	CO3	PO1
	b)	The stroke length of a spring motor is 7.5 cm and the diameter of the diaphragm is 25 cm, what should be the spring constant? For a specified hysteresis of 1 per cent, what would be the thrust and frictional forces?	6 Marks	L3	CO3	PO5
		(OR)				

8.	a)	Write a shot note on Sliding-stem control valves.	6 Marks	L2	CO3	PO1
	b)	What is control valve sizing? Explain in detail.	6 Marks	L1	CO3	PO1

UNIT-V

9.		Explain the feed forward control with an example. Compare this with feedback control.	12 Marks	L2	CO4	PO6

(OR)

10	a)	Explain over-ride control scheme.	8 Marks	L2	CO4	PO5
.	b)	What is constant reflex rate and steam rate?	4 Marks	L1	CO4	PO2

CODE No.: 19BT61002 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

ANALYTICAL INSTRUMENTATION

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Describe the working of paramagnetic gas analyzer with suitable diagrams.	6 Marks	L1	CO1	PO1
	b)	Explain different conductivity meters with neat sketches.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Outline the working principle of any two pH meters with necessary diagrams.	6 Marks	L3	CO2	PO2
	b)	Illustrate the working of hydrogen gas analyzer.	6 Marks	L3	CO1	PO1
		UNIT-II				
3.	a)	Interpret the application of detection system in gas chromatography.	6 Marks	L2	CO1	PO1
	b)	Select suitable liquid chromatography detector system for analysis of a liquid sample.	6 Marks	L3	CO2	PO5
		(OR)				
4.	a)	Outline the construction and working principle of fluorescence detector with neat diagram.	6 Marks	L4	CO1	PO2
	b)	Illustrate the significance of refractive index detector in liquid chromatography.	6 Marks	L3	CO2	PO1
		UNIT-III				
5.	a)	Explain the various components of absorption instrument with a neat sketch.	6 Marks	L2	CO1	PO1
	b)	Outline the working principle of double beam spectrophotometer.	6 Marks	L4	CO2	PO2
		(OR)				
6.	a)	Illustrate the working of FTIR spectrophotometer with neat diagrams.	6 Marks	L3	CO1	PO1
	b)	Select a suitable spectrophotometer for qualitative analysis in the field of biomedical with a detailed explanation.	6 Marks	L3	CO2	PO6
		UNIT-IV				
7.	a)	Illustrate the working of atomic absorption spectrometer with neat diagram.	6 Marks	L3	CO2	PO1
	b)	Outline the use of clinical flame photometer in biomedical applications.	6 Marks	L4	CO1	PO2
		(OR)				
8.	a)	Describe the working of Magnetic deflection type mass analyzer.	6 Marks	L2	CO2	PO1
	b)	Discuss the construction and working of ESR spectrometer with a neat sketch.	6 Marks	L2	CO2	PO1
		UNIT-V				
9.	a)	Outline the significance of nuclear radiation detection in nuclear power plants.	6 Marks	L4	CO3	PO7
	b)	Compare different nuclear radiation detectors.	6 Marks	L4	CO3	PO2

(OR)

10.	a)	Analyze the working of any one pollution monitoring instrument with suitable application.	6 Marks	L4	CO4	PO7
	b)	Explain turbidity and nephelometery with neat diagrams.	6 Marks	L2	CO4	PO1

CODE No.: 19BT61003 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

INDUSTRIAL DATA COMMUNICATIONS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Sketch a typical SCADA system.	6 Marks	L3	CO1	PO1
	b)	Explain impedance coupling of electrical noise and the solution to minimize its effect in the data communications system.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	With a neat diagram, explain various layers of OSI model.	6 Marks	L2	CO1	PO1
	b)	Discuss some rules that are useful in troubleshooting a communications system effectively.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Describe half-duplex operation of the EIA-232 interface.	8 Marks	L2	CO1	PO1
	b)	Compare EIA-232 and EIA-485 interfaces.	4 Marks	L4	CO1	PO2
		(OR)				
4.	a)	Discuss the ways by which noise can be induced into an EIA-232 circuit.	6 Marks	L2	CO1	PO1
	b)	Analyze the test equipment used for troubleshooting an EIA-485 system.	6 Marks	L4	CO1	PO2
		UNIT-III				
5.	a)	Interpret the frequency shift keying technique used in HART protocol with a neat sketch.	6 Marks	L3	CO2	PO1
	b)	Describe the main features of AS-interface.	6 Marks	L2	CO2	PO1
		(OR)				
6.	a)	How to use HART protocol in point-to-point or multi-drop network configurations?	6 Marks	L3	CO2	PO1
	b)	Explain in detail about data link layer in AS-interface.	6 Marks	L2	CO2	PO1
		UNIT-IV				
7.	a)	Summarize the architecture of the ProfiBus protocol stack	6 Marks	L3	CO3	PO1
	b)	Illustrate the operation of ProfiBus DP mono-master and multi-master systems.	6 Marks	L4	CO3	PO2
		(OR)				
8.	a)	Analyze the relationship between the real field device and the Virtual Field Device (VFD).	6 Marks	L4	CO3	PO2
	b)	Discuss the role of bus monitor in a ProfiBus network.	6 Marks	L2	CO3	PO1
		UNIT-V				
9.	a)	Describe Manchester Bi-phase L encoding scheme used in physical layer of Foundation Field Bus, with a neat diagram.	6 Marks	L2	CO4	PO1
	b)	Discuss about wiring configuration of FieldBus with a neat diagram.	6 Marks	L2	CO4	PO1
		(OR)				
10.	a)	Summarize the features and benefits of Foundation Field Bus.	6 Marks	L2	CO4	PO1
	b)	Explain data link layer and application layer of Foundation Field Bus.	6 Marks	L2	CO4	PO1

CODE No.: 19BT61004 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

POWER PLANT INSTRUMENTATION

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	With neat sketch, describe the process of thermal power plant.	6 Marks	L2	CO1	PO1
	b)	Emphasize the objectives of instrumentation and control in power generation.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	With neat sketch, describe the process of hydropower plant.	6 Marks	L2	CO1	PO1
	b)	Categorize the various conventional power plants.	6 Marks	L4	CO1	PO1
		UNIT-II				
3.	a)	Describe the operation of Gas holder level measuring technique for the measurement of gas in air fuel circuit.	6 Marks	L2	CO4	PO2
	b)	Explain the measurement of fuel flow/quantity in air fuel circuit.	6 Marks	L2	CO4	PO2
		(OR)				
4.	a)	Illustrate the operation of steam temperature measurement with a neat sketch.	6 Marks	L2	CO2	PO2
	b)	Justify how the differential pressure method is used for drum level measurement.	6 Marks	L5	CO2	PO2
		UNIT-III				
5.	a)	Describe the operation of Cascade steam temperature control with neat sketch.	6 Marks	L2	CO3	PO1
	b)	Explain the operation of Furnace draft control in air fuel circuit.	6 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Explain the operation of two element drum level control in boilers.	6 Marks	L2	CO3	PO2
	b)	Illustrate the operation of super heater by pass damper control in fire side steam temperature control with a neat sketch.	6 Marks	L2	CO3	PO2
		UNIT-IV				
7.	a)	Explain the operation of turbine safety monitoring system with a neat sketch.	6 Marks	L2	CO5	PO1
	b)	Design a system to measure mechanical parameters in the measurement of turbine in power plants.	6 Marks	L6	CO4	PO2
		(OR)				
8.	a)	Illustrate the schematic diagram of turbo alternator cooling system and describe briefly.	6 Marks	L1	CO1	PO1
	b)	Describe the operation of various controls in lubrication system.	6 Marks	L2	CO4	PO1
		UNIT-V				
9.		Discuss in detail about start up and shutdown interlocks in boilers.	12 Marks	L6	CO5	PO1
		(OR)				
10.	a)	Discuss in detail about explosion hazards and intrinsic safety.	6 Marks	L2	CO5	PO6
	b)	Discuss in detail about maintenance and life cycle costs in power plants.	6 Marks	L6	CO5	PO1

CODE No.: 19BT61201 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

CLOUD COMPUTING

[Information Technology]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Describe challenges involved in adopting cloud computing.	6 Marks	L1	CO1	PO1
	b)	Differentiate types of virtualizations.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Define Virtualization. List and explain the characteristics of Virtualization.	6 Marks	L2	CO1	PO1
	b)	What is Xen? Discuss its elements for virtualization.	6 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Describe different types of deployment models in Cloud computing.	6 Marks	L2	CO2	PO1
	b)	Describe the features of the Jolicloud Netbook OS.	6 Marks	L1	CO2	PO1
		(OR)				
4.	a)	Illustrate and explain the portion of the cloud computing stack that is designated as the server.	6 Marks	L2	CO2	PO1
	b)	Compare and Contrast between NIST and Cloud Cube model.	6 Marks	L2	CO2	PO2
		UNIT-III				
5.	a)	Recall IaaS workload. Show how three virtual private server instances are partitioned in an IaaS stack.	8 Marks	L1	CO3	PO1
	b)	Describe system Metrics for capacity planning.	4 Marks	L1	CO3	PO2
		(OR)				
6.	a)	Describe the baseline measurements for Capacity planning.	6 Marks	L1	CO3	PO1
	b)	What is capacity planning? Explain the steps involved in the iterative process of capacity planning.	6 Marks	L2	CO3	PO4
		UNIT-IV				
7.	a)	Distinguish between Indexed search and the dark web in Google service portfolio.	7 Marks	L4	CO4	PO3
	b)	Describe the features of Windows Azure platform.	5 marks	L2	CO4	PO3
		(OR)				
8.		Azure is a virtualized infrastructure to which a set of additional enterprise services has been layered on top. Justify.	12 Marks	L4	CO4	PO3
		UNIT-V				
9.	a)	Describe different types of Amazon Database Services.	8 Marks	L2	CO5	PO2
	b)	Describe Elastic Compute Cloud (EC2).	4 Marks	L2	CO5	PO3
		(OR)				
10.		Create a virtual machine instance with 2GB RAM and 200 GB hard disk configuration on Amazon Web Services (AWS) cloud through Elastic Compute Cloud (EC2) service and develop a home web page for online book store information.	12 Marks	L4	CO5	PO5

CODE No.: 19BT61502 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

INFORMATION SECURITY

[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Enumerate the impact of active and passive attacks on a system with necessary examples.	6 Marks	L1	CO1	PO1
	b)	List and explain the different security mechanisms.	6 Marks	L1	CO1	PO2
		(OR)				
2.	a)	Explain about Distributed SYN flood attack.	6 Marks	L1	CO1	PO2
	b)	List and explain the four phases in the lifetime of a virus.	6 Marks	L1	CO2	PO3
		UNIT-II				
3.	a)	Draw SSH protocol stack explaining SSH connection protocol.	6 Marks	L2	CO3	PO2
	b)	List the nine services provided by wireless LANs defined by IEEE 802.11.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Interpret the working of SSL record protocol operation.	6 Marks	L2	CO3	PO1
	b)	Draw the WAP architecture explaining the different components.	6 Marks	L2	CO3	PO2
		UNIT-III				
5.	a)	List the MIME content types with suitable description.	6 Marks	L1	CO4	PO1
	b)	Illustrate the key components of the internet mail architecture.	6 Marks	L3	CO4	PO4
		(OR)				
6.	a)	Summarize the function of keyrings in PGP.	6 Marks	L2	CO4	PO1
	b)	Compare the transport and tunnel modes of IPSec.	6 Marks	L3	CO4	PO3
		UNIT-IV				
7.	a)	Discuss briefly about Statistical Anamoly detection approach for intrusion detection.	6 Marks	L2	CO5	PO2
	b)	List and briefly define four techniques to avoid guessable passwords.	6 Marks	L1	CO6	PO3
		(OR)				
8.	a)	Illustrate the functioning of a packet filtering firewall.	6 Marks	L3	CO5	PO1
	b)	Define the terms: i) Masquerader. ii) Misfeasor. iii) Clandestine user.	6 Marks	L2	CO2	PO1
		UNIT-V				
9.	a)	Identify the steps involved in installing Tor.	6 Marks	L2	CO6	PO5
	b)	Discuss various tools that can be used for safeguarding against phishing.	6 Marks	L2	CO6	PO1
		(OR)				
10.	a)	Illustrate the steps to setup GPG with Apple's Mail.app.	6 Marks	L3	CO6	PO5
	b)	Describe how PwdHash and Remote PwdHash would help users for password management.	6 Marks	L2	CO6	PO1

❀ ❀ ❀

CODE No.: 19BT70401 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

EMBEDDED SYSTEMS

[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Compare Harvard and Von-Neumann architecture.	6 Marks	L3	CO1	PO1
	b)	Summarize the registers of MSP 430.	6 Marks	L4	CO1	PO2
		(OR)				
2.	a)	Describe anatomy of a small microcontroller.	6 Marks	L2	CO1	PO2
	b)	Discuss different types of exceptions.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Illustrate the addressing modes of MSP 430.	6 Marks	L3	CO2	PO1
	b)	Write a C code for MSP 430 to flash LED with a frequency of 1Hz using a software delay.	6 Marks	L4	CO2	PO3
		(OR)				
4.		Discuss various aspects of C for Embedded Systems.	12 Marks	L2	CO2	PO2
		UNIT-III				
5.	a)	Demonstrate each bit of watchdog timer control register.	6 Marks	L3	CO3	PO6
	b)	List the steps involved s a program to carry out measurements of the charging time followed by the discharging time of Comparator_A.	6 Marks	L1	CO3	PO6
		(OR)				
6.	a)	Write a short note on capacitative touch sensing with Comparator_A.	6 Marks	L4	CO3	PO1
	b)	Compare ADC10 and ADC12.	6 Marks	L3	CO3	PO8
		UNIT-IV				
7.	a)	Demonstrate interfacing of master with multiple slaves using SPI.	6 Marks	L3	CO3	PO8
	b)	Describe the bit banging in I2C Protocol.	6 Marks	L2	CO3	PO8
		(OR)				
8.	a)	Write short notes on CAN bus.	6 Marks	L1	CO3	PO1
	b)	Draw the simplified block diagram of the USCI_B0 module in SPI master mode.	6 Marks	L1	CO3	PO2
		UNIT-V				
9.	a)	Justify the need for concurrent process model.	6 Marks	L3	CO4	PO8
	b)	Compare different IC technologies.	6 Marks	L3	CO4	PO6
		(OR)				
10.	a)	Illustrate the elevator problem using PSM.	6 Marks	L4	CO4	PO8
	b)	Discuss various design technologies used for embedded system development.	6 Marks	L2	CO4	PO6

CODE No.: 19BT71203 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Regular Examinations June – 2022

BIG DATA TECHNOLOGIES

[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the concept of Hadoop EcoSystem.	6 Marks	L3	CO1	PO1
	b)	Explain the advantages and applications of BigData.	6 Marks	L3	CO1	PO1
		(OR)				
2.	a)	Describe the structure of Big Data.	6 Marks	L1	CO1	PO1
	b)	Illustrate various Hadoop releases.	6 Marks	L3	CO1	PO5
		UNIT-II				
3.		Explain the below concepts. i) Data flow. ii) Hadoop Archives. iii) Java Interface.	12 Marks	L3	CO2	PO1
		(OR)				
4.	a)	Explain the concept of Hadoop Distributed file system.	6 Marks	L3	CO2	PO2
	b)	Define Integrity. Explain Hadoop data Integrity.	6 Marks	L3	CO2	PO1
		UNIT-III				
5.	a)	List and explain MapReduce types.	6 Marks	L1	CO3	PO2
	b)	Outline the concept of sorting feature in Hadoop.	6 Marks	L2	CO3	PO3
		(OR)				
6.		Discuss the process of data analysis with Hadoop.	12 Marks	L2	CO3	PO3
		UNIT-IV				
7.	a)	State Hive command to create a table with four columns: First name, last name, age, and Gender.	6 Marks	L1	CO4	PO2
	b)	Explain the difference between MapReduce and PIG.	6 Marks	L3	CO4	PO3
		(OR)				
8.	a)	Explain the concept of Zookeeper.	6 Marks	L3	CO4	PO3
	b)	Explain the concept of joins in MapReduce.	6 Marks	L3	CO3	PO2
		UNIT-V				
9.	a)	Explain the concept of Data Processing operators.	6 Marks	L3	CO3	PO3
	b)	Explain how to import large objects by using Sqoop.	6 Marks	L3	CO4	PO5
		(OR)				
10.	a)	Describe the concept of SQOOP in detail.	6 Marks	L1	CO4	PO3
	b)	Write the hive commands to create Twitter Database.	6 Marks	L4	CO4	PO8

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC10) Supplementary Examinations February – 2021

FINITE ELEMENT METHODS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer any FIVE questions
All questions carry equal marks

1. a) Enumerate the advantage of FEM. List out some of the computer software packages available for FEM. Mention their general capabilities.
b) In a plane stress problem, we have σ_x=1000MPa, σ_y= -150MPa, E=200GPa, G =100GPa and v = 0.3. Deter the value of the stress ϵ_x, ϵ_y and σ_{xy}.

2. Derive the element stiffness matrix for a quadratic one dimensional bar element.

3. A cantilever beam of length 3.4m has an elastic spring support of stiffness 230kN/m at its free end, where a point load of 13kN acts. Take Young's modulus as 200GPa and area moment of inertia of the cross-section as 1×10^{-4} m^4. Determine the displacement and slope at the node and reactions.

4. For a triangular plate shown in the figure 1, determine the deflection at the point of load using one triangular element. Thickness is 10mm, E = 70×10^3MPa, μ = 0.3

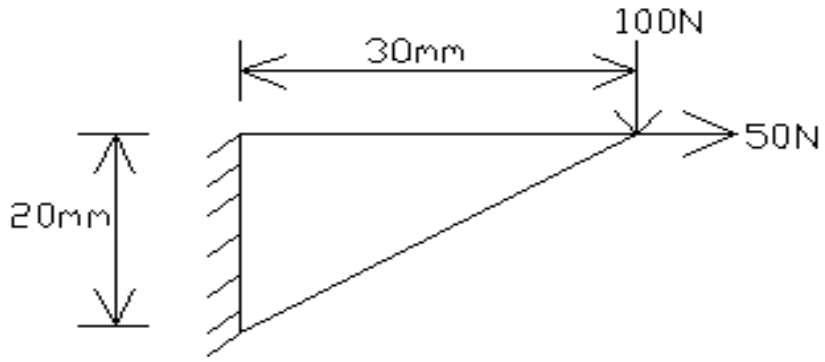


Fig. 1

5. Derive the element stiffness matrix for a quadrilateral element.

6. Heat is generated in a large plate with k = 0.7 w/m°c at the rate of 3000 w/m^3, the plate is 20cm thickness, outside surface of plate is exposed to atmospheric air at 35°c with convective heat transfer coefficient, h=25w/m^2 ^{0}c. Determine the temperature distribution in plate by taking 2 elements.

7. Explain the basic differential equations for fluid flow problems, its one dimensional formulation and corresponding finite element equations and also method of solving by taking a suitable example.

8. Determine the lowest Eigen value and corresponding mode for the beam shown in the Fig.2. Take E = 200GPa, ρ = 7840kg/m^3, I = 2000mm^4, A = 240mm^2.

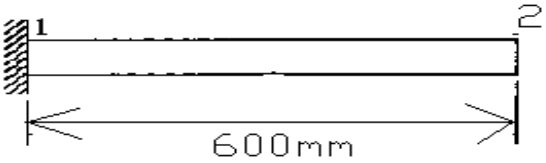


Fig. 2

CODE No.:14BT60401 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC-14) Supplementary Examinations August – 2021

DIGITAL SIGNAL PROCESSING

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Determine the z-transform the signal $x(n) = (-1)^n \cos\left(\frac{n\pi}{3}\right)u(n)$ 7 Marks

b) Find the DTFT of the sequence $x(n) = \cos(n\pi/3)u(n)$. 7 Marks

(OR)

2 a) Explain the significance of frequency domain representation of discrete time signals and system. 7 Marks

b) Determine the response of discrete time system given by difference $Y(n) = -0.8y(n-1) + x(n)$. When the input is step and y(-1)=0. 7 Marks

UNIT-II

3 a) Contrast the transforms DTFT, DFS and DFT. 7 Marks

b) Develop the inverse FFT algorithm with neat sketch for N=8. 7 Marks

(OR)

4 a) What is DFT? Interpret role of DFT over the DTFT. 7 Marks

b) Develop the DIT FFT algorithm with neat sketch for N=8. 7 Marks

UNIT-III

5 a) Derive the relation between analog and digital frequency in bilinear transformation. 7 Marks

b) Compare Bi-linear and Impulse Invariant Transformations. 7 Marks

(OR)

6 a) For the given specifications α_p = 3 dB; α_s = 15 dB Ω_p = 1000 Rad/sec. Design a high pass filter using Butterworth approximation. 7 Marks

b) Derive the frequency mapping expression for bilinear transformation. 7 Marks

UNIT-IV

7 a) Design a linear phase FIR low pass filter using rectangular window with a cut off frequency ω_c=0.2πrad/sample by taking 7samples of window sequence. 7 Marks

b) What is the drawback in FIR filter design using windows and frequency sampling method? How is it overcome? 7 Marks

(OR)

8 a) Explain the design of linear phase FIR filter by the Frequency sampling method. 5 Marks

b) Obtain the Cascade and parallel form of realizations for the following transfer function $H(z) = \frac{16(1+z)z^2}{(4z^2 - 27z + 1)(4z + 3)}$. 9 Marks

UNIT-V

9 a) Describe the function of on-chip peripherals used in P-DSP. 7 Marks

b) Explain the addressing modes supported by C6X. 7 Marks

(OR)

10 a) Discuss about multiple access memory and multiported memory. 7 Marks

b) Explain the features of 'C6X processes. 7 Marks

❀ ❀ ❀

CODE No.:14BT60431 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations August – 2021

PRINCIPLES OF COMMUNICATION

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) What are the types of communications? Explain. 6 Marks

b) Deduct the Fourier transform for a Gate function 8 Marks

$G_\tau(t)=1 \quad |t| < \tau/2$

$0 \quad |t| > \tau/2$

(OR)

2 a) Explain in detail about each block of basic electrical communication system with neat block diagram. 8 Marks

b) Define autocorrelation function and prove all its properties. 6 Marks

UNIT-II

3 a) With necessary expressions, waveforms and spectrums, explain AM for an arbitrary baseband signal m(t). 8 Marks

b) Explain the indirect method of generation of FM wave. 6 Marks

(OR)

4 a) What is the need for modulation? 4 Marks

b) Deduce the equation for narrow band FM. 6 Marks

c) An AM transmitter radiates 9KW of power when the carrier is Unmodulated and 10.125KW when the carrier is sinusoidally modulated. Find the modulation index. 4 Marks

UNIT-III

5 a) What are FDM And TDM? Compare both of them. 8 Marks

b) Explain cross talk in PAM due to HF and LF limitations of the channel. Which of these two affects more than one channel and mention the reasons? 6 Marks

(OR)

6 a) Explain natural sampling and flat top sampling and compare these two. 8 Marks

b) Two signals are band limited to 3 and 5 kHz, and are to be time division multiplexed. Find the maximum possible interval between two successive samples. 6 Marks

UNIT-IV

7 a) Discuss about the block diagram of PCM and explain each block in detail. 8 Marks

b) Explain the Generation and Detection of Coherent Binary PSK Signals. 6 Marks

(OR)

8 a) Determine the bandwidth required for M-ary FSK. Draw the geometrical representation of M-ary FSK signal. 9 Marks

b) Discuss the principle of DPSK. 5 Marks

UNIT-V

9 a) If a transmitter transmits the message with their probabilities are 0.4, 0.2, 0.1, 0.21, 0.05, 0.03, 0.01. Find the coding efficiency using Shanon-Fano algorithm. 8 Marks

b) Define minimum distance of a code word and weight of the code word. 6 Marks

(OR)

10 a) Write short notes on the following: 6 Marks

i) Mutual Information. ii) Average information.

b) Discuss and examine the Convolution Codes with examples. 8 Marks

CODE No.:14BT61201 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC-14) Supplementary Examinations August – 2021

DATAWAREHOUSING AND DATA MINING

[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Draw and explain the components of Data Warehouse Architecture.	8 Marks
	b)	Differentiate OLAP ***Vs*** OLTP systems.	6 Marks
		(OR)	
2	a)	Discuss in detail about data mining functionalities.	8 Marks
	b)	Explain the concept of data generalization and summarization based characterization.	6 Marks

UNIT-II

3	a)	What is preprocessing and why is it required to preprocess the data.	7 Marks
	b)	Define data cleaning. Explain basic methods for data cleaning.	7 Marks
		(OR)	
4	a)	Write about data integration and transformation with examples.	7 Marks
	b)	Explain about data cube aggregation in data reduction.	7 Marks

UNIT-III

5		What is Association Rule? Write and explain Apriori algorithm with a suitable example.	14 Marks
		(OR)	
6		Explain in detail about Multilevel and Multidimensional association rule mining.	14 Marks

UNIT-IV

7	a)	What is tree pruning? Explain various pruning techniques.	4 Marks
	b)	Explain feed forward neural network with suitable example.	10 Marks
		(OR)	
8	a)	Differentiate classification and Prediction.	6 Marks
	b)	Describe various Prediction techniques with suitable examples.	8 Marks

UNIT-V

9	a)	Explain Density based method with example.	7 Marks
	b)	Differentiate between partitioning and Hierarchical clustering methods.	7 Marks
		(OR)	
10	a)	Describe about Detection methods.	7 Marks
	b)	Describe AGNES vs DIANA.	7 Marks

CODE No.:14BT70101 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations August – 2021

STEEL STRUCTURES
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Mention the standard specifications and codes of steel structures. Mention mechanical properties of steel. 14 Marks

(OR)

2 Define rolled steel sections and mention the types of rolled steel sections with a neat sketch representing the shapes and dimensions. 14 Marks

UNIT-II

3 Two ISF sections 200mm x 10mm each and 1.5m long are to be jointed to make a member length of 3.0m. Design a butt joint with the bolts arranged in the diamond pattern. The flats are supposed to carry a factored tensile force of 450KN. Steel of grade Fe410 .20mm diameter bolts of a grade 4.6 are used to make the connection also determine the net tensile strength or the main plate and corner plate. 14 Marks

(OR)

4 Design a fillet weld to join a tension member consisting of 2 ISA 100mm x 75mm x 8mm to a 12mm thick gusset plate. The factored tensile load is 410 KN. 14 Marks

UNIT-III

5 Design a single angle to carry a tension of 150kN. The end connection is to be done using M20 bolts of product Grade C and property class 4.6. The yield and ultimate strengths of the steel are 250MPa and 410MPa, respectively. 14 Marks

(OR)

6 Design a single angle discontinuous strut to carry a factored axial compressive load of 65 kN. The length of strut is 3.0m between intersections. It is connected to 12mm thick gusset plate by 20mm diameter 4.6 grade bolts. Use steel of grade Fe 410. 14 Marks

UNIT-IV

7 Design a laterally unsupported beam for the following data: 14 Marks
Effective span = 4 m; Maximum bending moment = 550 kN-m;
Maximum shear force=200 kN; Steel of grade Fe = 410.

(OR)

8 Design a column of effective length 5.90 m. It is subjected to a factored axial compressive load of 2000 kN. Provide two channels back to back connected with battens by site welded connections. Use steel of grade Fe 410. 14 Marks

UNIT-V

9	A column of ISMB 400 is subjected to an axial force of 750kN. Use appropriate techniques to analyse and design suitable base plate. Assume necessary data required.	14 Marks

(OR)

10	A built up column consists ISHB 400@ 77.40 kg/m with one 300mm x 12mm flange plate on each side. The column carries an axial load of 2600kN. Determine the suitable dimension for a gusseted base, if the column is supported on concrete pedestal with a bearing pressure of $5N/mm^2$.	14 Marks

CODE No.:14BT70104 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC-14) Supplementary Examinations August – 2021

TRANSPORTATION ENGINEERING–II

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) A vehicle of weight 2.0 tonneshidsthreough a distance equal to 40 m before colliding with another parked vehicle of weight 1.0 tonne. After collision both the vehicles skid through a distance equal to 12 m before stopping. Compute the initial speed of the moving vehicle. Assume coefficient of friction as 0.5. 7 Marks

b) Discuss about accident studies and records. Analyse accident rate with respect to time 7 Marks

(OR)

2 a) Explain Road user and Vehicle characteristics. 7 Marks

b) Analyse graphically and through formulae, the relationship between Speed, Travel time, Volume, Density and Capacity. 7 Marks

UNIT-II

3 a) Indicate the how the traffic volume data are presented and results used in traffic volume studies? 7 Marks

b) A vehicle skids through a distance equal to 40 m before colliding with another parked vehicle, the weight of which is 75 per cent of the former. After collision if both the vehicles skid through 14 m before stopping compute the initial speed of moving vehicle. Assume friction coefficient of 0.62. 7 Marks

(OR)

4 a) Explain traffic capacity, basic capacity, possible capacity, practical capacity and PCU. 7 Marks

b) Calculate the basic capacity of traffic lane at a speed of 50 kmph. Assume that all the vehicles are of average length 5 m. 7 Marks

UNIT-III

5 What are various traffic signs and explain with neat sketches. 14 Marks

(OR)

6 At a right-angled intersection of two roads, Road 1 has four lanes with a total width of 12.00 m and Road 2 has two lanes with a total width of 6.6m. The volume of traffic approaching the intersection during design hour are 900 and 743 PCU/hour on the two approaches of Road 2. Design the signal timings as per IRC guidelines. 14 Marks

UNIT-IV

7 The spot speeds at a particular location are normally distributed with a mean of 51.7 KPH and a standard deviation of 8.3 KPH. What is the probability that 14 Marks

i) The sppeds exceed 65 KPH.
ii) And the speeds lie between 40 KPH and 70 KPH.
iii) What is the 85^{th} percentile speed?

(OR)

8 At a highway location with poor geometrics, the mean spot speed observed with a sample of 200 vehicles was 58.3 KPH with a standard deviation of 12.2 KPH. After effecting improvements to the geometrics, the mean speed observed with a sample of 250 vehicles was 61.2 KPH with a standard deviation of 9.8 KPH. Has there been a significant increase in the speed after the improvements? 14 Marks

UNIT-V

9	a)	Explain briefly the methodology of Road safety Audit.	7 Marks
	b)	Write a short note on the following. i) Transport system magement. ii) Travel demand Management.	7 Marks

(OR)

10	a)	Briefly explain various methods to reduce air and noise pollution due to traffic.	7 Marks
	b)	Briely explain Various traffic forecasting techniques.	7 Marks

CODE No.:14BT70202 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations August – 2021

POWER SYSTEM OPERATION AND CONTROL
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Derive the condition for economical load dispatch among various generating plants. Also explain with flow chart for the solution of economical load dispatch problem by λ-iteration method — 7 Marks

b) Determine the operating schedule of 2-generator case of 100MW each whose incremental characteristics are given by — 7 Marks

$$\frac{dF_1}{dF_2} = 2 + 0.012P_1 \qquad \frac{dF_2}{dP_2} = 1.5 + 0.015P_2$$

The minimum load on each unit is 10MW .The total load to be supplied is 150MW

(OR)

2 a) Derive transmission line loss equation in terms of B-Coefficients. — 7 Marks

b) Three plants of total capacity 500Mw are scheduled for operation to supply a total system load Of 310Mw. Evaluate the optimum load scheduling .If the plants have the following incremental cost characteristics and the limitations — 7 Marks

$$\frac{dc_1}{dp_{g_1}} = 0.12P_{G1} + 30Rs/MWh$$

$$\frac{dc_2}{dp_{g2}} = 0.2P_{G2} + 40.0Rs/MWh$$

$$\frac{dc_3}{dp_{g3}} = 0.15P_{G3} + 10Rs/MWh$$

$30 \le P_{G1} \le 150 \qquad 20 \le P_{G2} \le 100 \qquad 50 \le P_{G3} \le 250.$

UNIT-II

3 Obtain the Optimal Operation of a fundamental hydro thermal system with necessary equations. — 14 Marks

(OR)

4 a) Obtain the short-term scheduling of hydrothermal power system using penalty factor. — 7 Marks

b) Derive and explain about Hydro Power Equation. — 7 Marks

UNIT-III

5 Draw the flowchart and explain the unit commitment problem using priority list method. — 14 Marks

(OR)

6 a) Explain the dynamic programming method used for unit commitment of power flow. — 7 Marks

b) Explain the various constraints in unit commitment problem. — 7 Marks

UNIT-IV

7	a)	Derive the Model of a Speed governing systems and represent it by a block diagram.	7 Marks
	b)	Explain the effect of varying excitation of a Synchronous generator	7 Marks

(OR)

8	a)	Draw the block diagram representation of steam turbine and obtain the approximate linear model.	7 Marks
	b)	Derive the Model of a Generator Load model and represent it by a block diagram.	7 Marks

UNIT-V

9	a)	Explain about LFC of isolated power system; derive the steady state frequency error.	8 Marks
	b)	Define the terms: Tie Line, Coherent group, Control Area.	6 Marks

(OR)

10	a)	Explain the concept of 'control area' with respect to power system and develop the appropriate block diagram representation of two area LFC and explain.	7 Marks
	b)	What are tie-line oscillations? What determines the frequency of these oscillations?	7 Marks

CODE No.:14BT70203 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations August – 2021

POWER SYSTEM ANALYSIS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Develop all incidence matrices A, A^, B, B^, C and C^ for the network shown in fig 1.consider bus 1 as reference. 14 Marks

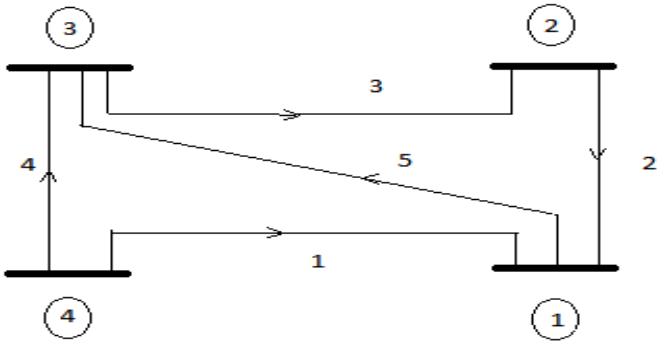


fig (1)

(OR)

2 a) Deduce the equation to form Y_{bus} using singular transformation method. 8 Marks

b) State and explain primitive network. 6 Marks

UNIT-II

3 Develop the design procedure of modification of existing Z_{Bus} by adding branch from new bus (p) to reference node, from new bus (p) to existing bus (k), from existing bus (k) to reference node and between existing buses (j) and (k).

(OR)

4 a) With the help of expressions, explain the procedure of representing tap changing transformers. 7 Marks

b) Write down the expressions and explain the terms in Park's and Clarke's transformations. 7 Marks

UNIT-III

5 a) Explain the algorithm for Gauss seidel load flow method. 10 Marks

b) Explain the significance of slack bus in load flow studies. What is the data needed for load flow studies? 4 Marks

(OR)

6 Determine bus voltages at the end of 2nd iteration by Gauss-Seidal method. Take acceleration factor as 1.6. 14 Marks

Table 1

Bus Code	Admittances (p.u)
1 – 2	2 – j8
1 – 3	1 – j4
2 – 3	0.6 – j2.6

Table 2

Bus Code	P_D in p.u	Q_D in p.u	V in p.u	Remarks
1	–	–	1.06∟0°	Slack
2	0.5	0.2	–	PQ
3	0.4	0.3	–	PQ

UNIT-IV

7	a)	Derive the necessary expressions for Jacobian matrix elements for N-R method in Polar form.	10 Marks
	b)	Compare the features of Gauss - Seidel and Newton - Raphson load flow methods.	4 Marks

(OR)

8		Explain with a flow chart the computational procedure for load flow solution using Newton Raphson method.	14 Marks

UNIT-V

9	a)	Write a note on methods of improving steady state and transient stabilities of a power system network.	7 Marks
	b)	Explain point by point method of solving Swing equation by deriving necessary equations.	7 Marks

(OR)

10	a)	Define the following terms: i) Steady state stability. ii) Dynamic stability. iii) Transient stability. iv) Steady state stability limit. v) Synchronizing power co-efficient.	7 Marks
	b)	List the assumptions made in stability solution. Also discuss the various methods of improving stability.	7 Marks

CODE No.:14BT70301 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations August – 2021

FINITE ELEMENT METHODS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) List the advantages, disadvantages and limitations of FEM. 7 Marks

b) Describe the general steps of the finite element method. 7 Marks

(OR)

2 For the three stepped bar shown in below Fig.1. 14 Marks

Consider E_1=70 GPa, E_2=105 GPa, E_3=200 GPa, A_1=900 mm², A_2= 400 mm² and A_3 = 200 mm².

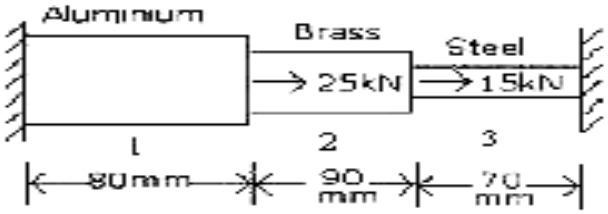


Fig .1

Determine

(a) i) The displacement at Nodes 2 and 3.
ii) Stresses in three sections.
iii) Reactions at the ends.

UNIT-II

3 For the beam shown in Fig.2 calculate the deflection under the load and construct the shear force and bending moment diagrams for the beam. 14 Marks

Take E = 20 x 10^6 N/cm² and I = 2500 cm⁴.

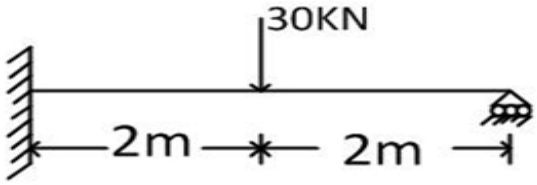


Fig.2

(OR)

4 Derive the element stiffness matrix and the nodal load matrices for a B-nodal triangular element. 14 Marks

UNIT-III

5 Derive the element stiffness matrix and load vector and traction for a CST element. 14 Marks

(OR)

6 For a long cylinder of inside diameter 8cm and outside diameter 12cm snugly fits in a hole over its full length as shown in Fig.3. The cylinder is subjected to an internal pressure of 5 MPa. Using two element model over a length of 1cm, Evaluate nodal displacements and element stresses. Take $E = 20 \times 10^6$ N/cm^2 and $k = 0.3$ 14 Marks

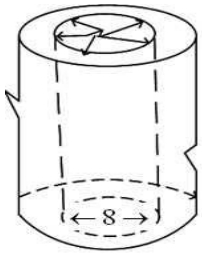


Fig.3

UNIT-IV

7 Consider a brick wall thickness 0.3m with the thermal conductivity of 0.7 W/mK. The inner surface is at 28ºC and the outer surface is exposed to cold air with the heat transfer coefficient of 40 W/m² K at -15ºC. Determine the steady state temperature distribution and also the heat flux through the wall. Use two elements and obtain the solution. 14 Marks

(OR)

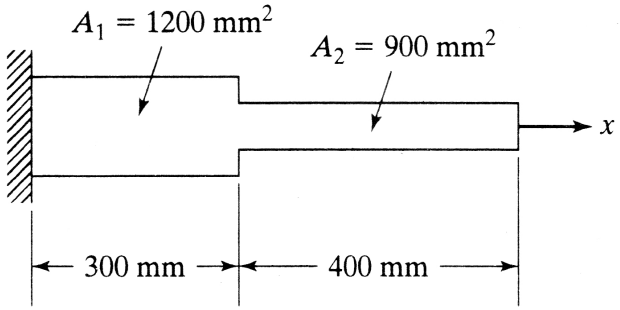
8 Discuss the formulation of 4-noded iso parametric element and derive the stiffness matrix for it. 14 Marks

UNIT-V

9 Derive the element consistent mass matrix for a CST element. 14 Marks

(OR)

10 Determine the natural frequencies of the stepped bar shown in Fig. 4. Take E=200GPa and density=7850 kg/m³. 14 Marks



Steel bar

Fig. 4.

CODE No.:14BT71504 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations August – 2021

SIMULATION AND MODELING
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Briefly explain simulation of inventory system.	7 Marks
	b)	Describe how arrays are used for List Processing.	7 Marks
		(OR)	
2		Discuss in detail various features when selecting simulation software.	14 Marks

UNIT-II

3	a)	Explain the following continuous distribution: i) Uniform distribution. ii) Exponential distribution.	6 Marks
	b)	Explain the properties of a Poisson process.	8 Marks
		(OR)	
4	a)	Discuss about non stationary Poisson process.	7 Marks
	b)	Describe empirical distributions.	7 Marks

UNIT-III

5		List out the measures of performance of queuing systems.	14 Marks
		(OR)	
6	a)	Describe the steady state behavior of finite population model.	7 Marks
	b)	The malfunctions occur in a widget making machines follows Poisson process with rate of malfunctions at 1.5 per hour. The repair times by the single mechanic takes with mean time of 30 minutes and standard deviation of 20 minutes. What is the steady time average number of broken machines?	7 Marks

UNIT-IV

7	a)	What is a random number and what are its properties?	7 Marks
	b)	Describe the process to test the uniformity using Kolmogorov -Smirnov test.	7 Marks
		(OR)	
8	a)	Describe the method of generating random numbers using combined linear congruential method.	7 Marks
	b)	Describe the method of generating random variates for the exponential distribution.	7 Marks

UNIT-V

9	a)	List out the precautions to be taken while collecting the data.	7 Marks
	b)	What are the parameter estimators for Poisson, Exponential and Normal Distributions?	7 Marks
		(OR)	
10		Describe the general strategy to obtain Batch means for interval estimation in steady state simulation.	14 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

DIGITAL SIGNAL PROCESSING
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Find out the Z-transform for the discrete time sequence $x(n) = kn,\ n \geq 0$.	7 Marks
	b)	Define causality and stability of an LTI system and state the conditions for stability.	7 Marks

(OR)

2	a)	Explain frequency analysis of periodic discrete time signal using Fourier series method.	7 Marks
	b)	Determine the impulse response of a discrete time system given by difference equation $y(n) - 3y(n-1) - 4y(n-2) = x(n) + 2x(n-1)$.	7 Marks

UNIT-II

3	a)	Contrast the transforms DTFT, DFS and DFT.	7 Marks
	b)	Develop the inverse FFT algorithm with neat sketch for N=8.	7 Marks

(OR)

4	a)	What is DFT? Interpret role of DFT over the DTFT.	7 Marks
	b)	Develop the DIT FFT algorithm with neat sketch for N=8.	7 Marks

UNIT-III

5	a)	Derive the relation between analog and digital frequency in bilinear transformation.	7 Marks
	b)	Compare Bi-linear and Impulse Invariant Transformations.	7 Marks

(OR)

6	a)	For the given specifications $\boldsymbol{\alpha_p}$ = 3dB; $\boldsymbol{\alpha_s}$ = 15dB $\boldsymbol{\Omega_p}$ = 1000 Rad/sec. Design a high pass filter using Butterworth approximation.	7 Marks
	b)	Derive the frequency mapping expression for bilinear transformation.	7 Marks

UNIT-IV

7	a)	Analyze the characteristics of Rectangular, Bartlet and Blackman windows with neat sketch.	7 Marks
	b)	Explain the realization of cascade and Linear phase structure of an FIR system.	7 Marks

(OR)

8	a)	Discuss the FIR filter design by using window method.	8 Marks
	b)	Design a linear phase FIR band pass filter to pass frequencies in the range 0.4π to 0.6π rad/sample by taking 7 samples of hanning window.	6 Marks

UNIT-V

9	a)	Explain the various addressing modes used in P-DSPs.	7 Marks
	b)	Explain the internal and external memory organization in C6X.	7 Marks

(OR)

10	a)	Discuss about multiple access memory and multiported memory.	7 Marks
	b)	Describe the peripheral used in C6X processor with a block diagram.	7 Marks

CODE No.:14BT61201 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

DATAWAREHOUSING AND DATA MINING

[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define data ware housing. Explain the characteristics of data ware house.	7 Marks
	b)	Briefly discuss the working principle of data mining.	7 Marks
		(OR)	
2	a)	List and explain different types of data mining functionalities.	7 Marks
	b)	What are the major issues in data mining?	7 Marks

UNIT-II

3	a)	Differentiate data preprocessing and data cleaning methods.	7 Marks
	b)	Write about dimensionality reduction.	7 Marks
		(OR)	
4	a)	Describe about discretization and concept hierarchy generation.	7 Marks
	b)	Write about data integration and transformation with examples.	7 Marks

UNIT-III

5	a)	Explain about multilevel and multidimensional association rule mining.	7 Marks
	b)	Illustrate about mining frequent and closed patterns with examples.	7 Marks
		(OR)	
6	a)	Explain Apriori algorithm, finding frequent itemset using candidate generation.	7 Marks
	b)	Explain the approaches to mine multilevel association rules.	7 Marks

UNIT-IV

7	a)	Explain issues regarding Bayesian classification with an example.	7 Marks
	b)	Describe the techniques to improve classification accuracy.	7 Marks
		(OR)	
8	a)	Describe about decision tree induction with an example.	7 Marks
	b)	Demonstrate about rule based classification with an example.	7 Marks

UNIT-V

9	a)	Define cluster analysis. Write types with examples.	7 Marks
	b)	Explain outlier analysis.	7 Marks
		(OR)	
10	a)	Explain partitioning methods with examples.	7 Marks
	b)	Explain Hierarchical methods with example.	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

POWER SEMICONDUCTOR DRIVES
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	State the advantages of electric drives over other drives.	7 Marks
	b)	List and explain various components of load torques.	7 Marks
		(OR)	
2	a)	Describe the closed loop configurations in electric drives.	7 Marks
	b)	Discuss the nature and classification of load torque.	7 Marks

UNIT-II

3	a)	Explain rectifier control of **dc** series motor.	7 Marks
	b)	Speed of a **dc** series motor coupled to a fan load is controlled by variation of armature voltage. When armature voltage is 400 V, motor takes 20A and the fan speed is 250 r.p.m. The combined resistance of armature and field is 1.0Ω. Calculate: i) Motor armature voltage for the fan speed of 350 r.p.m. ii) Motor speed for the armature voltage of 250 V.	7 Marks
		(OR)	
4	a)	Explain continuous and discontinuous operation of three phase semi controlled converter connected to separately excited **dc** motor.	7 Marks
	b)	A 220V, 1200 r.p.m 15A separately excited motor has the armature resistance and Inductance of 1.8 Ω and 32mH respectively. This motor is controlled by a single phase fully controlled rectifier with an AC source voltage of 230V, 50Hz. Identify modes and calculate developed speeds for: i) $\alpha = 45^0$ and Torque = 40 N-m. ii) $\alpha = 45^0$ and Torque = 10 N-m.	7 Marks

UNIT-III

5		Explain closed loop control scheme for speed control of dc separately excited motor.	14 Marks
		(OR)	
6	a)	Explain the speed control of dc series motor fed from two quadrant choppers. Draw the motoring and regenerative braking characteristics.	7 Marks
	b)	A 220 V, 24 A, 1000 r.p.m **dc** separately excited motor has an armature resistance of 2Ω. Motor is controlled by a basic chopper with frequency of 500Hz and source voltage of 230V. Calculate the duty ratio for 1.2 times rated torque and 500 r.p.m.	7 Marks

UNIT-IV

7	a)	Explain speed control of Induction motors using AC voltage controller.	6 Marks
	b)	Explain with circuit and waveforms for speed control of induction motor by Static rotor resistance.	8 Marks

(OR)

8	a)	Why stator voltage control is suitable for speed control of induction motors in fan and pump drives.	7 Marks
	b)	With necessary block diagram, explain operation of variable frequency control of 3-phase Induction motor.	7 Marks

UNIT-V

9	a)	Discuss modes of operation of switched reluctance motor.	8 Marks
	b)	State the advantages and disadvantages of stepper motors.	6 Marks

(OR)

10	a)	Discuss torque-stepping rate characteristics of stepper motor.	6 Marks
	b)	Explain converter circuits and modes of operation of switched reluctance motor.	8 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

POWER SYSTEM OPERATION AND CONTROL

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Derive the condition for economical load dispatch among various generating plants. Also explain with flow chart for the solution of economical load dispatch problem by λ-iteration method — 7 Marks

b) Determine the operating schedule of 2-generator case of 100MW each whose incremental characteristics are given by — 7 Marks

$$\frac{dF_1}{dF_2} = 2 + 0.012P_1 \qquad \frac{dF_2}{dP_2} = 1.5 + 0.015P_2$$

The minimum load on each unit is 10MW. The total load to be supplied is 150MW

(OR)

2 a) Incremental fuel costs for a power plant consisting of 3 generating units are — 7 Marks

$IC_1=20+0.3P_1$ $IC_2=30+0.4P_2$ $IC_3=30$.

Where p_1 is the power in MW generated by unit i for i=1, 2 and 3. Assume that all the generators are operating all the time. Minimum and maximum loads on each unit are 50MW and 300MW respectively. If the plant is operating on economic load dispatch to supply the total power demand of 700MW, the power generated by each unit is?

b) Derive the Exact coordination equation (economic operation of power system considering losses). — 7 Marks

UNIT-II

3 a) Derive the co-ordination equation for the optimal scheduling of hydrothermal interconnected power plants**.** — 7 Marks

b) Explain different constraints to be considered for mathematical modeling of hydrothermal scheduling. — 7 Marks

(OR)

4 a) Obtain the short-term scheduling of hydrothermal power system using penalty factor. — 7 Marks

b) Derive and explain about Hydro Power Equation. — 7 Marks

UNIT-III

5 a) Discuss the dynamic programming method to solve unit commitment problem in a power system. — 7 Marks

b) What is the cost function for unit commitment? Explain its significance in unit commitment. — 7 Marks

(OR)

6 What are the various methods of unit commitment? Explain each of them with relevant equations. — 14 Marks

UNIT-IV

7	a)	Draw the block representation of a complete AC excitation system and explain its features.	7 Marks
	b)	Explain the various performance requirements of excitation system.	7 Marks

(OR)

8		Draw a neat sketch of a typical turbine speed governing system and derive its block representation and transfer function.	14 Marks

UNIT-V

9	a)	Define the terms: i) Control Area. ii) Coherent Group. iii) Area Control Error.	5 Marks
	b)	Deduce with necessary equations, Dynamic response of LFC of an isolated power system with integral controller.	9 Marks

(OR)

10	a)	Explain about LFC of isolated power system; derive the steady state frequency error.	8 Marks
	b)	Define the following terms: i) Tie Line ii) Coherent group iii) Control Area.	6 Marks

CODE No.:14BT70203 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

POWER SYSTEM ANALYSIS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) For the network of the Fig.1, draw the graph and write a tie-set schedule. Using the tie-set schedule obtain the loop equations and find the currents in all branches. 7 Marks

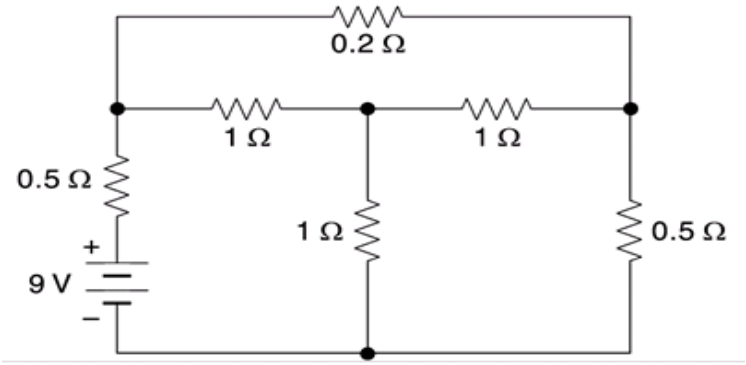


Fig. 1

b) For the network of Fig.1, write a cut-set schedule, obtain modal equations and find branch currents. 7 Marks

(OR)

2 a) What is primitive network matrix and represent its forms? Prove $Y_{bus} = A_t[y]A$ using singular transformation. 10 Marks

b) What is the difference between element-node incidence matrix and bus-incidence matrix? 2 Marks

c) What is primitive network matrix? 2 Marks

UNIT-II

3 a) Starting from Z_{bus} for a partial network describe step - by - step how you willobtain the Z_{bus} for a modified network when a new line is to be added to a bus in theexisting network. 7 Marks

b) Obtain the Park's Transformation matrix. 7 Marks

(OR)

4 a) Describe the procedure for the modification of Z_{bus} when a line with mutual impedance is added or removed. 8 Marks

b) Explain the purpose of Parks's transformation with neat diagram and relevant equations. 6 Marks

UNIT-III

5 a) What are the initial conditions assumed for the power flow studies by GS method? What is acceleration factor? What is its role in GS method for power flow studies? 7 Marks

b) Draw and explain the flow chart for Gauss Seidel load flow method. 7 Marks

(OR)

6 Determine bus voltages at the end of 2nd iteration by Gauss-Seidal method. Take acceleration factor as 1.6. 14 Marks

Table 1

Bus Code	Admittances (p.u)
1 – 2	2 – j8
1 – 3	1 – j4
2 – 3	0.6 – j2.6

Table 2

Bus Code	P_D in p.u	Q_D in p.u	V in p.u	Remarks
1	–	–	$1.06\angle 0^\circ$	Slack
2	0.5	0.2	–	PQ
3	0.4	0.3	–	PQ

UNIT-IV

7 a) Develop static load flow equations in rectangular form. 7 Marks

b) Compare different methods of load flow studies. 7 Marks

(OR)

8 a) Explain fast decoupled load flow studies with relevant equations. 7 Marks

b) Deduce the equations of elements of Jacobin matrix in rectangular coordinates. 7 Marks

UNIT-V

9 a) Derive the expression for Swing equation of a SMIB system. What is the significance of swing curve? 7 Marks

b) With the help of Equal area criterion for one machine connected to Infinite bus, derive the expressions for critical clearing angle and critical clearing time. 7 Marks

(OR)

10 a) With the help of relevant expressions, explain the procedure of solving transient stability problem by Step by Step method. 7 Marks

b) A 50HZ generator is delivering 50% of the power that is capable of delivering through a transmission line to an infinite bus. A fault occurs that increases the reactance between generator and infinite bus 500% of the value before fault. When the fault is isolated the maximum power that can be delivered is 75% of the original maximum value. Determine the critical clearing angle for the condition delivered. 7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

FINITE ELEMENT METHODS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Write short notes on plane stress problem with suitable examples.	7 Marks
	b)	Derive the material constitutive matrix for a plane strain problem .	7 Marks
		(OR)	
2	a)	Derive the stress-strain relation matrix for a two-dimensional plane stress case.	7 Marks
	b)	Discuss the philosophy of finite element method.	7 Marks

UNIT-II

3	a)	Plot Hermite shape functions of a beam element and discuss the end conditions.	7 Marks
	b)	Explain the procedure used to determine support reactions of beam in FEM.	7 Marks
		(OR)	
4		A cantilever beam of 1m length carries a single point load at the end of the beam of 10kN. Calculate the deflection at the end of the beam using FEM, if E = 70Gpa, A=500mm^2 and I = 2500mm^4.	14 Marks

UNIT-III

5	a)	Derive the stiffness matrix of a constant strain triangle from fundamentals using Potential Energy approach.	8 Marks
	b)	Define plane stress and plane strain conditions with examples.	6 Marks
		(OR)	
6	a)	Give four different examples of axisymmetric problems with sketches.	7 Marks
	b)	Derive traction force vector for a uniformly distributed load acting on one of the sides of a linear Axisymmetric triangular element.	7 Marks

UNIT-IV

7		Discuss the formulation of 4-noded iso-parametric element and derive the stiffness matrix for it.	14 Marks
		(OR)	
8	a)	Discuss in detail about the concept of iso parametric element.	7 Marks
	b)	Differentiate sub parametric and super parametric elements.	7 Marks

UNIT-V

9	a)	Discuss about Lumped mass matrix and Consistent mass matrix.	6 Marks
	b)	Derive the elemental mass matrix for CST element**.**	8 Marks
		(OR)	
10	a)	Derive the element mass matrix for 1-D bar element.	7 Marks
	b)	Explain the features of Hamilton's interpolation function with an example.	7 Marks

❀ ❀ ❀

CODE No.:14BT70303 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations February - 2021

METROLOGY AND MEASUREMENTS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define "Interchangeability" and discuss its importance.	5 Marks
	b)	Describe in brief the construction and working of an optical comparator with a neat sketch.	9 Marks
		(OR)	
2	a)	What is meant by the term "fit". Explain the various types of fits.	7 Marks
	b)	State and explain Taylor's Principe of limit gauging.	7 Marks

UNIT-II

3	a)	Outline the importance of providing standards of length while measuring.	7 Marks
	b)	What is sine bar? How is it used for angle measurements?	7 Marks
		(OR)	
4	a)	Explain the principle of working of a sine bar for angular measurement with the help of a diagram. List the advantages and limitations of sine bar.	9 Marks
	b)	With the help of sketches, explain the working of an external micrometer.	5 Marks

UNIT-III

5	a)	Discuss the following terms in connection with surface finish measurement. i) Waviness. ii) Lay. iii) Sampling Length. iv) R_z value.	6 Marks
	b)	Explain the principle of Talysurf surface recorder with neat sketch.	8 Marks
		(OR)	
6	a)	List out various BIS symbols for indication of surface finish.	7 Marks
	b)	What are the elements of screw thread? Also explain errors in screw threads.	7 Marks

UNIT-IV

7		Mention various types of electrical transducers and explain in detail the working of inductance type of transducers with its advantages and disadvantages.	14 Marks
		(OR)	
8		List out different types of speed measuring devices and explain about Mechanical Tachometer and Electrical Tachometer.	14 Marks

UNIT-V

9	a)	Explain the calibration procedure in temperature measurement.	7 Marks
	b)	What is the principle of Radiation methods of measuring temperature?	7 Marks
		(OR)	
10	a)	Explain the principle of dead weight gauge.	7 Marks
	b)	Explain the principle of Prony brake Dynamometer.	7 Marks

CODE No.:14BT70305 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

REFRIGERATION AND AIR CONDITIONING

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Compare air refrigeration systems with vapor compression systems.	6 Marks
	b)	A Bell Coleman refrigeration cycle works between 1 bar and 5 bar. The adiabatic efficiency of compressor is 85% and expander is 90%. Find out COP of the system and its tonnage when air flow rate is 2 kg/s. The ambient temperature is 27^0C and the air coming out of refrigerator is 0^0C.	8 Marks
		(OR)	
2	a)	Sketch and explain the working of Boot strap cooling system used in Aircrafts.	10 Marks
	b)	Discuss the concepts of Heat engines, Refrigerators and Heat pumps.	4 Marks

UNIT-II

3	a)	Explain Vapor compression refrigeration system and sketch the processes on T-S and P-h property charts.	8 Marks
	b)	What is ASHRAE coding of refrigerants? Give examples for each class.	6 Marks
		(OR)	
4	a)	Discuss the effects of superheating and sub cooling on the performance of simple vapor compression refrigeration cycle.	6 Marks
	b)	What are the types of refrigerants and discuss the need of new refrigerants.	8 Marks

UNIT-III

5	a)	What are the desirable properties of a refrigerant - absorbent pair?	6 Marks
	b)	Sketch the layout of a Steam jet refrigeration system and explain its working.	8 Marks
		(OR)	
6	a)	Explain the working principle of steam jet refrigeration system.	8 Marks
	b)	Explain the working principle of thermoelectric refrigerator.	6 Marks

UNIT-IV

7	a)	Define the following. i) Specific humidity. ii) Relative humidity. iii) Sensible heating. iv) Sensible cooling. v) Humidification and dehumidification.	10 Marks
	b)	List the differences between summer and winter air conditioning systems.	4 Marks
		(OR)	
8	a)	Explain the following and represent it on psychometric chart. i) Cooling and dehumidification. ii) Heating and humidification. iii) Adiabatic saturation temperature. iv) Bypass factor.	10 Marks
	b)	Define psychometry and show all psychometric properties on psychometric chart.	4 Marks

UNIT-V

9	a)	Explain the factors on which comfort feeling of people in A/C depends.	6 Marks
	b)	Discuss Air to Air heat pump circuit and list its applications.	8 Marks
		(OR)	
10	a)	What is the importance of 'Thermodynamics of human body' in A/C system design?	8 Marks
	b)	Discuss the ways adopted to dehumidify the air in A/C systems.	6 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

LIGHT WAVE COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	State and derive Snell's Law.	6 Marks
	b)	Explain about various types of fiber materials.	8 Marks
		(OR)	
2	a)	Discuss briefly about fiber fabrication.	7 Marks
	b)	What is the basic principle of light propagation in optical fiber? Explain in detail.	7 Marks

UNIT-II

3	a)	Explain linear scattering losses in fibers.	7 Marks
	b)	Discuss dispersion mechanisms with regard to single mode fibers indicating the dominating effects. Hence describe how intermodal dispersion may be minimized within a single mode region?	7 Marks
		(OR)	
4		Write a short note on fiber connectors and explain types of connectors.	14 Marks

UNIT-III

5		Discuss PIN and Avalanche photo diode.	14 Marks
		(OR)	
6	a)	Discuss the principle working of distributed feedback laser.	7 Marks
	b)	What is the resonant frequency of laser? Derive the expression of wavelength spacing between two modes.	7 Marks

UNIT-IV

7	a)	Discuss in detail about fiber splicing and connectors.	7 Marks
	b)	Derive an expression for coupling of a total power from LED to graded index fiber.	7 Marks
		(OR)	
8	a)	Draw and explain various fiber alignment and joint losses.	7 Marks
	b)	Discuss briefly about fiber-fiber joints.	7 Marks

UNIT-V

9	a)	Explain the design and operation of a polarization independent isolator.	7 Marks
	b)	Discuss the concept of SONET.	7 Marks
		(OR)	
10		What is rise time budget analysis? Derive an expression for the total system rise time budget in terms of transmitter fiber and receiver rise time.	14 Marks

CODE No.:14BT71202 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

MULTIMEDIA AND APPLICATION DEVELOPMENT

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain in detail multimedia software tools.	7 Marks
	b)	Write short notes on various image data types.	7 Marks
		(OR)	
2	a)	Explain various color model s in images.	7 Marks
	b)	Write short notes on Digital Video.	7 Marks

UNIT-II

3	a)	Describe about Bound methods in Action Script.	7 Marks
	b)	Write about associative arrays and objects.	7 Marks
		(OR)	
4	a)	Write about overloading of methods in ACTION SCRIPT.	7 Marks
	b)	Write a program that shows the usage of data types.	7 Marks

UNIT-III

5	a)	Explain Subclasses of Movieclip.	7 Marks
	b)	Discuss MPEG4.	7 Marks
		(OR)	
6		Write about.	
		i) Analog Video.	7 Marks
		ii) Digital Video.	7 Marks

UNIT-IV

7		Describe the steps in the JPEG Encoder with a block diagram.	14 Marks
		(OR)	
8	a)	Explain Dictionary-Based Coding with an example.	7 Marks
	b)	Explain the following.	7 Marks
		i) Differential Coding of Images. ii) Lossless JPEG	

UNIT-V

9	a)	Discuss various parameters to improve the quality of multimedia data transmission.	6 Marks
	b)	Explain RTP and RTCP in detail.	8 Marks
		(OR)	
10	a)	Write short notes on video bitrates over ATM.	6 Marks
	b)	Explain Staggered Broadcasting and Pyramid Broadcasting.	8 Marks

CODE No.:14BT71501 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

EMBEDDED SYSTEM PROGRAMMING

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Draw and explain System On Chip (SOC).	7 Marks
	b)	Explain skills required foe an embedded system designer.	7 Marks
		(OR)	
2		Describe design process in embedded system with an example.	14 Marks

UNIT-II

3	a)	Explain different arithmetic and logic instructions in 8051 with examples.	10 Marks
	b)	Discuss about flags and register banks in 8051.	4 Marks
		(OR)	
4	a)	Write an assembly language program in 8051 for to place 00h to all memory locations from 20h to 2Ah.	7 Marks
	b)	Write an assembly language program in 8051 to find factorial of a given number.	7 Marks

UNIT-III

5	a)	Describe memory management in RTOS.	7 Marks
	b)	Discuss about interrupt mechanism in RTOS.	7 Marks
		(OR)	
6	a)	Discuss on State Machine Programming Models with an example.	7 Marks
	b)	Illustrate the suitability of object oriented programming in embedded systems.	7 Marks

UNIT-IV

7	a)	Discuss about the preprocessor global variable and preprocessor directives in embedded programming.	6 Marks
	b)	Discuss about program elements in embedded programming.	8 Marks
		(OR)	
8	a)	Discuss about the advantages and disadvantages of C++ in embedded programming.	6 Marks
	b)	Discuss about sequential program model of AVCM.	8 Marks

UNIT-V

9	a)	Discuss about simulators and laboratory tools.	10 Marks
	b)	Describe about linking and locating software's.	4 Marks
		(OR)	
10	a)	Distinguish between linkers and locators.	7 Marks
	b)	What is hardware software co-design? Explain in detail.	7 Marks

CODE No.:14BT71504 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations February – 2021

SIMULATION AND MODELING

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Briefly explain simulation of inventory system.	7 Marks
	b)	Describe how arrays are used for List Processing.	7 Marks
		(OR)	
2	a)	Describe the issues in the evaluation and selection of simulation software.	7 Marks
	b)	Describe the time advance algorithm.	7 Marks

UNIT-II

3	a)	Discuss about properties of a Poisson process.	7 Marks
	b)	Discuss about empirical distributions.	7 Marks
		(OR)	
4	a)	Explain any two discrete distributions and give equation for probability mass function. Also calculate mean and variance of same.	8 Marks
	b)	Illustrate the use of empirical distribution.	6 Marks

UNIT-III

5		List out the measures of performance of queuing systems.	14 Marks
		(OR)	
6	a)	Describe the steady state behavior of finite population model.	7 Marks
	b)	The malfunctions occur in a widget making machines follows Poisson process with rate of malfunctions at 1.5 per hour. The repair times by the single mechanic takes with mean time of 30 minutes and standard deviation of 20 minutes. What is the steady time average number of broken machines?	7 Marks

UNIT-IV

7	a)	Define random number. Explain statistical properties of random numbers with example.	7 Marks
	b)	Explain the various testes used for testing random numbers for their desirable properties.	7 Marks
		(OR)	
8		Categorize the distributions where the inverse transform technique can be used for sampling.	14 Marks

UNIT-V

9	a)	Discuss about Chi-Square test applied to Poisson assumption for goodness of it.	7 Marks
	b)	Discuss about AR[1] model.	7 Marks
		(OR)	
10	a)	Explain data collection and analysis for input modeling.	7 Marks
	b)	What is time series - input model? Explain AR (1) and EAR (1) model.	7 Marks

CODE No.:14BT51501 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations January – 2022

OPERATING SYSTEMS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	State and explain different operating system services.	7 Marks
	b)	Differentiate between sequential and batch processing.	7 Marks
		(OR)	
2	a)	What is meant by CPU Scheduling? Explain different scheduling algorithms with examples.	7 Marks
	b)	Write about Bootstrap program.	7 Marks

UNIT-II

3	a)	Illustrate reader's writer's problem and give a solution to it using semaphores.	7 Marks
	b)	Discuss monitor solution for dining philosopher's problem.	7 Marks
		(OR)	
4	a)	Outline the procedure for deadlock recovery.	7 Marks
	b)	Describe any one method for handling deadlock.	7 Marks

UNIT-III

5	a)	Illustrate how paging supports virtual memory.	7 Marks
	b)	Explain contiguous and non-contiguous memory allocation with example.	7 Marks
		(OR)	
6	a)	What is demand paging? Explain its concept.	5 Marks
	b)	Describe Page Replacement algorithms with an example.	9 Marks

UNIT-IV

7	a)	Explain the concept of Swap-Space Management.	6 Marks
	b)	Explain in detail about the following disk scheduling algorithms with examples. i) FCFS. ii) SSTF. iii) SCAN. iv) LOOK.	8 Marks
		(OR)	
8	a)	Explain the concept of file directory structures.	6 Marks
	b)	Discuss in detail about various file access methods.	8 Marks

UNIT-V

9	a)	Explain the goals and principles of protection.	7 Marks
	b)	What are access matrices? Explain its implementation.	7 Marks
		(OR)	
10		Write a short note on: i) Domain of protection. ii) Access Matrix.	14 Marks

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations January – 2022

DIGITAL SIGNAL PROCESSING
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Synthesize the response of LTI system for an input of unit impulse sequence. 7 Marks

b) Apply the knowledge of Z transform to find the response of discrete time system given by difference $y(n) = -0.8y(n-1) + x(n)$. 7 Marks

(OR)

2 a) Find the inverse z-transform of $x(z) = \dfrac{z^5 - 3}{1 - z^{-5}}$ $|z| > 1$. 7 Marks

b) Find the DTFT of the sequence $x(n) = \alpha^n \sin(nw_0)u(n)$.. 7 Marks

UNIT-II

3 a) Why DFT is preferred over DTFT? 2 Marks

b) Explain the need of zero padding in DFT Sequence. Compute the 8-point of DFT of the following sequence $x(n) = \{1, 1, 1, 1, 0, 0, 0, 0\}$. 5 Marks

c) By using DFT properties solve the following. 7 Marks

i) The even samples of the 11-pint DFT of a length-11 real sequence are given by $x(0) = 4$; $x(2) = -1 + 3j$; $x(4) = 2 + j5$; $x(6) = 9 - j6$; $x(8) = -5 - j8$; $x(10) = \sqrt{3} - j2$.

Determine the missing odd samples of the DFT.

(OR)

4 a) Compute the 8-point DFT of the sequence $x(n)=\cos(n\pi/2)$ using the DIT-FFT algorithm. Show all intermediate results. 7 Marks

b) Explain the need to go for FFT rather than DFT. 2 Marks

c) Find the inverse FFT of the given $x(k)=\{1, 2, 3, 4\}$ using DIF algorithm. 5 Marks

UNIT-III

5 a) Derive the frequency mapping expression for impulse invariant transformation. 7 Marks

b) Determine the order of a butterworth low pass filter satisfying the following specifications. fp = 0.10Hz, fs = 0.15Hz, αp = 0.5dB, αs = 15dB, f sample=1Hz. 7 Marks

(OR)

6 a) For the given specifications $\alpha_p = 3$ dB; $\alpha_s = 15$ dB $\Omega_p = 1000$ Rad/sec. Design a high pass filter using Butterworth approximation. 7 Marks

b) Derive the frequency mapping expression for bilinear transformation. 7 Marks

UNIT-IV

7 a) Explain the need for the use of window sequence in the design of FIR Filter. Describe the window sequence generally used and compare the properties. 5 Marks

b) Design an ideal high pass filter with a frequency response 9 Marks

$H_d(e^{j\omega}) = 1 \; for \; \dfrac{-\pi}{2} \le \omega \le \dfrac{\pi}{2}$; and $H_d(e^{j\omega}) = 0 \; for \; \dfrac{\pi}{2} \le |\omega| \le \pi$

Use Hamming window with N=11. Sketch the magnitude response.

(OR)

8 a) Explain the design of linear phase FIR filter by the Frequency sampling method. 5 Marks

b) Obtain the Cascade and parallel form of realizations for the following transfer function $H(z) = \frac{16(1+z)z^2}{(4z^2 - 27z + 1)(4z + 3)}$. 9 Marks

UNIT-V

9 a) Explain the various addressing modes used in P-DSPs. 7 Marks

b) Explain the internal and external memory organization in C6X. 7 Marks

(OR)

10 a) Discuss about multiple access memory and multiported memory. 7 Marks

b) Explain the features of 'C6X processes. 7 Marks

CODE No.:14BT70301 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations January – 2022

FINITE ELEMENT METHODS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	List the advantages, disadvantages and limitations of FEM.	7 Marks
	b)	Describe the general steps of the finite element method.	7 Marks

(OR)

2	a)	Derive the stress-strain relation matrix for a two-dimensional plane stress case.	7 Marks
	b)	Discuss the philosophy of finite element method.	7 Marks

UNIT-II

3		Starting from the first principles derives the stiffness matrix for a 1-D bar element and extends it for the plane truss element.	14 Marks

(OR)

4		A cantilever beam of 1 m length carries a single point load at the end of the beam of 10 kN. Calculate the deflection at the end of the beam using FEM, if E = 70 Gpa, A=500 mm^2 and I = 2500 mm^4.	14 Marks

UNIT-III

5		Derive the element stiffness matrix and load vector and traction for a CST element.	14 Marks

(OR)

6		With suitable examples, explain the meaning and formulations of properties of axi-symmetric elements. State their properties.	14 Marks

UNIT-IV

7	a)	Explain the capabilities of: i) Sub parametric. ii) Iso parametric. iii) Super parametric elements.	7 Marks
	b)	Discuss the concept of numerical integration.	7 Marks

(OR)

8		Analyze the following integral using one and two point Gaussian Quadrature formula and compare with exact solution.	14 Marks

$$I = \int_{-1}^{+1} \left[3e^{\xi} + \xi^2 + \frac{1}{(\xi+2)}\right] d\xi$$

UNIT-V

9	a)	Derive the element mass matrix for 1-D bar element.	7 Marks
	b)	Explain the features of Hamilton's interpolation function with an example.	7 Marks

(OR)

10	a)	Discuss about Lumped mass matrix and Consistent mass matrix.	6 Marks
	b)	Derive the elemental mass matrix for CST element.	8 Marks

CODE No.:14BT70303 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations January - 2022

METROLOGY AND MEASUREMENTS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define the following terms with an example: i) Allowance. ii) Clearance. iii) Interference.	9 Marks
	b)	List out various advantages and limitations of limit gauges.	5 Marks
		(OR)	
2	a)	Explain unilateral system and bilateral system of tolerances.	5 Marks
	b)	Describe in brief the construction and working of a pneumatic comparator with a neat sketch.	9 Marks

UNIT-II

3	a)	Name the various factors affecting the accuracy of a sine bar.	7 Marks
	b)	Explain why it is not performed to use a sine bar for generating angles larger than 45^0, if high accuracy in angle generation is required.	7 Marks
		(OR)	
4	a)	Explain the utility of straight edge and surface plate in laboratories.	7 Marks
	b)	Describe working principle of NPL flatness interferometer with a neat sketch.	7 Marks

UNIT-III

5	a)	What is the 'best size' wire? Derive an expression for the same in terms of the pitch and angle of the thread.	7 Marks
	b)	Explain with the help of sketch, the working principle of the instrument which is used in checking of profile of the gear.	7 Marks
		(OR)	
6	a)	What is meant by alignment tests on machine tools and why they are necessary?	6 Marks
	b)	Name and describe with neat sketches, the various alignment tests performed on a drilling machine.	8 Marks

UNIT-IV

7	a)	With neat sketch, explain the working principle of Strain gauge load cell.	7 Marks
	b)	With the help of neat sketches, explain the working of any two non contact type Tachometers.	7 Marks
		(OR)	
8	a)	With a neat sketch of LVDT, explain the measurement of displacement.	7 Marks
	b)	What are the different arrangements of strain gauge rosettes? Explain them.	7 Marks

UNIT-V

9	a)	Explain the principle of Thermocouple.	7 Marks
	b)	Briefly explain any one method of pressure measurement.	7 Marks
		(OR)	
10	a)	Explain the force measuring technique with neat sketch.	7 Marks
	b)	Explain the principle of vibrating wire transducer.	7 Marks

CODE No.:14BT70401 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations January – 2022

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Classify the errors in measurement.	7 Marks
	b)	Differentiate between accuracy and precision.	7 Marks
		(OR)	
2	a)	How a calibration is done using potentiometer method for a **dc** Voltmeter?	7 Marks
	b)	Explain in detail about the Ramp type DVM.	7 Marks

UNIT-II

3	a)	List out different applications of spectrum analyzer.	7 Marks
	b)	Describe the working of Function generator with the block diagram.	7 Marks
		(OR)	
4	a)	Describe the working of a sweep frequency generator with the block diagram.	7 Marks
	b)	Explain in detail about the Heterodyne Harmonic Distortion analyzer.	7 Marks

UNIT-III

5	a)	Explain the basic principle of oscilloscope and explain the function of sweep generator.	7 Marks
	b)	Draw the block diagram of digital storage oscilloscope and explain functions of each block.	7 Marks
		(OR)	
6	a)	Draw the block diagram of dual-beam CRO and explain its working.	8 Marks
	b)	Explain the method of finding phase, frequency relationship of two waveforms using Lissajous figures.	6 Marks

UNIT-IV

7	a)	Derive the balanced condition for Modified Wheatstone Bridge.	7 Marks
	b)	The arms of an AC Maxwell's bridge are arranged as follows AB and BC are non reactive resistors of 100Ω each. DA a standard variable reactor L_1 of resistance 32.7 Ω and CD consists of standard variable resistor R in series with a coil of the unknown impedance Z, balance was found with L_1=50mH and Z=1.36R. Find R and L of coil.	7 Marks
		(OR)	
8	a)	Derive the balance condition for Anderson's bridge.	7 Marks
	b)	Select various precautions to be taken while using X-Y Recorder.	7 Marks

UNIT-V

9	a)	Derive the expression for Gauge factor of a strain Gauge.	8 Marks
	b)	Explain the operation of piezo electric transducers.	6 Marks
		(OR)	
10	a)	Explain about single channel data acquisition system.	6 Marks
	b)	Explain the working principle of an accelerometer.	8 Marks

CODE No.:14BT70403 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations January - 2022

LIGHT WAVE COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain in detail about Materials used in fabrication of Optical fibers.	9 Marks
	b)	Determine the normalized frequency at 820nm for a step index fiber having a 25μm x 5m core radius, $n_1 = 1.48$ and $n_2 = 1.46$. i) How many modes propagate in this fiber at 820nm? ii) What percent of the optical power flows in the cladding?	5 Marks
		(OR)	
2	a)	A given APD (Avalanche Photo Diode) has a quantum efficiency of 65% at wavelength of 900nm. If 0.5μw of optical power produces a multiplied photo current of 10μA, find the multiplication factor M.	6 Marks
	b)	Explain the following terms with reference to a photo detector. i) Quantum noise. ii) Dark current noise.	8 Marks

UNIT-II

3	a)	Explain what is intermodal dispersion and how it could be reduced.	8 Marks
	b)	A step index multimode glass fiber has a core diameter of 70μm and cladding refractive index of 1.45. If it is to have a limiting intermodal dispersion δT of 10ns/km. Calculate the maximum bit rate for transmission over a distance of 10km.	6 Marks
		(OR)	
4	a)	What is meant by material dispersion? Derive its expression.	7 Marks
	b)	Explain what do you understand by phase and group velocity of the signal transmitted in a fiber.	7 Marks

UNIT-III

5	a)	Contrast PIN Diode and Avalanche Photo Diode.	7 Marks
	b)	Discuss the LASER Diode Principle, modes and threshold conditions.	7 Marks
		(OR)	
6	a)	Calculate the ratio of the stimulated emission rate to the spontaneous emission rate for an incandescent lamp at a temperature of 1000K. It may be assumed that the average operating wavelength is 0.5μm.	6 Marks
	b)	Sketch and explain the Fabry-Perot resonator cavity of laser for sustained oscillations.	8 Marks

UNIT-IV

7	a)	What are splices? Explain different types of splices.	7 Marks
	b)	Derive an expression for coupling of a total power from LED to single mode fiber.	7 Marks
		(OR)	
8	a)	With the help of diagrams, neatly explain about Lensing schemes for coupling Improvement.	8 Marks
	b)	Explain the following terms: (i)V-groove splicing. (ii)Elastic tube splicing.	6 Marks

UNIT-V

9	a)	Discuss the working of isolator and circulators.	8 Marks
	b)	What is WDM and list the reasons for its development as a major communication technology?	6 Marks

(OR)

10	a)	Explain the working principle of passive optical star coupler.	7 Marks
	b)	Discuss in detail about SONET/SDH ring architecture.	7 Marks

CODE No.:14BT51501 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations June – 2022

OPERATING SYSTEMS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Differentiate between preemptive and non-preemptive scheduling.	7 Marks
	b)	Illustrate the purpose of fork system call with an example.	7 Marks
		(OR)	
2	a)	Explain briefly about Inter Process Communication.	7 Marks
	b)	Name the common services provided by an operating system. Explain them.	7 Marks

UNIT-II

3	a)	Define process synchronization. Describe the critical section problem.	7 Marks
	b)	Explain in detail about semaphores.	7 Marks
		(OR)	
4		Write bankers algorithm for deadlock. Illustrate it with an example.	14 Marks

UNIT-III

5	a)	Given memory partitions of 100K, 500K, 200K, 300K and 600K. Apply first fit, best fit and worst fit to place 212K, 417K, 112K, and 426K.	7 Marks
	b)	Illustrate about Translation Lookaside Buffer (TLB) in detail.	7 Marks
		(OR)	
6	a)	What is locality of reference? Differentiate between paging and segmentation.	7 Marks
	b)	Explain the differences between : i) Logical and physical address space. ii) Internal and external fragmentation.	7 Marks

UNIT-IV

7	a)	Write briefly about file attributes, operations, types and structure.	7 Marks
	b)	Discuss in detail about any two file allocation methods.	7 Marks
		(OR)	
8	a)	Explain about any two disk scheduling with suitable example.	7 Marks
	b)	Describe briefly about disk structure.	7 Marks

UNIT-V

9	a)	Write a short note on: i) Polling. ii) Interrupts.	7 Marks
	b)	Explicate direct memory access.	7 Marks
		(OR)	
10		Illustrate with an example about implementation of access matrix.	14 Marks

❀ ❀ ❀

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations June - 2022

DIGITAL SIGNAL PROCESSING

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Synthesize the response of LTI system for an input of unit impulse sequence. 7 Marks

b) Apply the knowledge of Z transform to find the response of discrete time system given by difference $y(n) = -0.8y(n-1) + x(n)$. 7 Marks

(OR)

2 a) Using the properties of DTFT, find the frequency domain representation of following signals. 7 Marks

i) $\left(\frac{1}{3}\right)^{|n-3|} u(n-3)$; ii) $n3^{-n}\, u(-n)$.

b) Interpret why Convolution sum is not sufficient for realizing IIR discrete time system. 7 Marks

UNIT-II

3 a) Determine linear convolution of $x(n) = \{1, 1, 2, 2\}$ and $h(n) = \{1, 2, 1\}$ using DFT. 10 Marks

b) State and prove circular convolution in time domain property of DFT. 4 Marks

(OR)

4 a) Determine 4-Point DFT of $x(n) = \{1, -1, 2, -2\}$. 7 Marks

b) State and prove the circular frequency shifting property of DFT. 7 Marks

UNIT-III

5 a) Explain about Frequency warping effect and suggest a remedy for it. 7 Marks

b) For the given analog transfer function $H_a(s) = 3/(s+1)(s+4)$, determine H(z) for T=1 sec using impulse invariant method. 7 Marks

(OR)

6 a) Derive the relation between analog and digital frequency in bilinear transformation. 7 Marks

b) Compare Bi-linear and Impulse Invariant Transformations. 7 Marks

UNIT-IV

7 a) Explain designing of FIR filter using frequency sampling technique. 7 Marks

b) Realize the following FIR system described by equation using the direct form and linear phase structure. $H(z) = \frac{1}{4} + \frac{1}{2}z^{-1} + \frac{3}{4}z^{-2} + \frac{1}{2}z^{-3} + \frac{1}{4}z^{-4}$. 7 Marks

(OR)

8 a) Discus about characteristics of symmetric and anti-symmetric FIR filters. 7 Marks

b) Design a Linear phase band pass FIR filter with a cutoff frequencies in the range 0.4π to 0.6π rad/sample by taking 7 samples of hamming window. Take N=11. 7 Marks

UNIT-V

9 a) Distinguish synchronous and asynchronous mode of operation of serial ports. 7 Marks

b) Explain special addressing modes in Programmable DSPs. 7 Marks

(OR)

10 a) List the relative merits and demerits of RISC and CISC processors. 7 Marks

b) What is the function of MAC unit used in DSP? Explain any two methods used to avoid over flow and underflow. 7 Marks

CODE No.:14BT70301 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations June – 2022

FINITE ELEMENT METHODS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Write short notes on plane stress problem with suitable examples.	7 Marks
	b)	Derive the material constitutive matrix for a plane strain problem. .	7 Marks

(OR)

2	a)	Describe the general steps of finite element method.	7 Marks
	b)	State few applications of FEM.	4 Marks
	c)	Write the stress strain relations in three dimensional stress systems.	3 Marks

UNIT-II

3		Starting from the first principles derives the stiffness matrix for a 1- d bar element and extends it for the plane truss element.	14 Marks

(OR)

4		A cantilever beam of 1m length carries a single point load at the end of the beam of 10 kN. Calculate the deflection at the end of the beam using FEM, if E = 70 Gpa, A=500 mm^2 and I = 2500 mm^4.	14 Marks

UNIT-III

5		Derive the element stiffness matrix and load vector and traction for a CST element.	14 Marks

(OR)

6	a)	Derive the stiffness matrix of a constant strain triangle from fundamentals using Potential Energy approach.	8 Marks
	b)	Define plane stress and plane strain conditions with examples.	6 Marks

UNIT-IV

7		Discuss the formulation of 4-noded iso-parametric element and derive the stiffness matrix for it.	14 Marks

(OR)

8		Consider a brick wall (0.7 W/m K) of thickness 30 cm. The inner surface is at 28^0C and the outer surface is exposed to cold air with heat transfer coefficient of 36 W/m^2 K at -15^0C. Determine the steady state temperature distribution and heat flux throw the wall.	14 Marks

UNIT-V

9	a)	Derive the element mass matrix for 1-D bar element.	7 Marks
	b)	Explain the features of Hamilton's interpolation function with an example.	7 Marks

(OR)

10	a)	Explain the features of, Hamilton's interpolation function with an example.	5 Marks
	b)	Derive the shape functions for four noded bar element using Lagrangian interpolation function. Nodes are equally spaced.	5 Marks
	c)	Derive the elemental mass matrix for 2-D triangular element.	4 Marks

CODE No.:14BT70303 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations June – 2022

METROLOGY AND MEASUREMENTS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define "Interchangeability" and discuss its importance.	5 Marks
	b)	Describe in brief the construction and working of an optical comparator with a neat sketch.	9 Marks

(OR)

2	a)	What is meant by the term "fit". Explain the various types of fits.	7 Marks
	b)	State and explain Taylor's Principe of limit gauging.	7 Marks

UNIT-II

3	a)	Brief note on Calibration of slip gauges and Dial indicators.	7 Marks
	b)	Distinguish between line, end and wave length standards.	7 Marks

(OR)

4	a)	List out different methods of measurement of angles and tapers and explain about angular measurement with bevel protractor.	8 Marks
	b)	Describe about working principle of optical flat and autocollimators.	6 Marks

UNIT-III

5	a)	List out various BIS symbols for indication of surface finish.	7 Marks
	b)	What are the elements of screw thread? Also explain errors in screw threads.	7 Marks

(OR)

6	a)	List out various gear measuring instruments. Also describe the procedure about finding pressure angle and tooth thickness.	7 Marks
	b)	Explain the various standard alignment tests performed on Milling Machine.	7 Marks

UNIT-IV

7		Mention various types of electrical transducers and explain in detail the working of inductance type of transducers with its advantages and disadvantages.	14 Marks

(OR)

8		List out different types of speed measuring devices and explain about Mechanical Tachometer and Electrical Tachometer.	14 Marks

UNIT-V

9	a)	Differentiate between Radiation and Optical Pyrometers.	5 Marks
	b)	How can you measure force with load cell? Explain in detail.	9 Marks

(OR)

10	a)	Explain the Laws of Thermo Couples and also their practical significance.	5 Marks
	b)	Explain the construction and working of Prony break Dynamometer.	9 Marks

CODE No.:14BT70304 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations June – 2022

INDUSTRIAL AUTOMATION AND ROBOTICS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Describe the basic elements of an automated system.	7 Marks
	b)	Illustrate various part transfer methods and mechanisms.	7 Marks
		(OR)	
2	a)	Discuss various levels of automation.	7 Marks
	b)	List out various challenges in assembly process and systems assembly line.	7 Marks

UNIT-II

3		Classify Robots by workspace geometry with a neat sketch.	14 Marks
		(OR)	
4	a)	Illustrate end effectors' types, challenges.	8 Marks
	b)	Compare electrical actuators with Hydraulic actuators and write any five advantages of electrical actuators.	6 Marks

UNIT-III

5		Obtain the resultant vector, given a vector u = 2i + 4j + 6k, translating it to (0, 2, 4), rotating by 90^0 about Z-axis and then 30^0 about X-axis.	14 Marks
		(OR)	
6		Discuss about the forward solution in robot kinematics, using D-H matrix.	14 Marks

UNIT-IV

7		Explain the various steps involved in Trajectory Planning.	14 Marks
		(OR)	
8	a)	With a neat sketch, explain the working of a tactile position sensor.	6 Marks
	b)	What is a proximity sensor? Explain any one of such sensor.	8 Marks

UNIT-V

9	a)	What are the methods used for programming a robot?	8 Marks
	b)	What are the goals of artificial intelligence?	6 Marks
		(OR)	
10	a)	Discuss about robot intelligence and task planning.	6 Marks
	b)	Give over view of robot application.	8 Marks

CODE No.:14BT70305 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations June – 2022

REFRIGERATION AND AIR CONDITIONING

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	How is ideal reversed Carnot cycle modified to result in Bell-Coleman cycle?	7 Marks
	b)	The capacity of a refrigerator is 200TR when working between -6ºC.and 25ºC. Determine the mass of ice produced per day from water at 25ºC. Also find the power required to drive the unit. Assume that the cycle operates on reversed Carnot cycle and latent heat of ice is 335Kj/Kg.	7 Marks

(OR)

2	a)	Explain the differences between heat engine, refrigerator and heat pump and find their COP'S.	7 Marks
	b)	Explain the working principle of bootstrap air cooling system.	7 Marks

UNIT-II

3	a)	Discuss the effects of superheating and sub cooling on the performance of simple vapor compression refrigeration cycle.	6 Marks
	b)	What are the types of refrigerants and discuss the need of new refrigerants.	8 Marks

(OR)

4	a)	Illustrate the refrigeration cycle and T-S diagram. When the refrigerant is dry and saturated at the end of the compression and find an expression for the C.O.P.	8 Marks
	b)	What are the desirable properties of refrigerants and how do you select?	6 Marks

UNIT-III

5	a)	Explain the working principle of Li-Br vapour absorption refrigeration system.	8 Marks
	b)	Explain the working principle vortex tube.	6 Marks

(OR)

6	a)	Explain the working of an Electrolux refrigerator with a neat sketch.	7 Marks
	b)	Explain the working principle of steam Jet refrigeration system.	7 Marks

UNIT-IV

7		A spray cooling coil is chosen to operate under the following conditions. Air inlet - 28^0C & 21^0c WBT. Air outlet temperature -10^0C & 6^0C WBT. Amount of air flow – 2000 m^3/min. The chilled water inlet and out temperature – 7^0 C & 12^0C. Find i) the cooling load on the coil. ii) Water flow rate through the coil.	14 Marks

(OR)

8	a)	Explain the following and represent it on psychometric chart. i) Cooling and dehumidification. ii) Heating and humidification. iii) Adiabatic saturation temperature. iv) Bypass factor.	10 Marks
	b)	Define psychometry and show all psychometric properties on psychometric chart.	4 Marks

UNIT-V

9	a)	Draw the Skelton Comfort chart and explain its salient features.	7 Marks
	b)	Explain various factors governing the optimum effective temperature.	7 Marks
		(OR)	
10	a)	Compare the viscous impingement filter with the dry filter.	7 Marks
	b)	Write a short note on the air-washer type humidifier.	7 Marks

CODE No.:14BT71202 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations June – 2022

MULTIMEDIA AND APPLICATION DEVELOPMENT

[Computer Science And Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain in detail multimedia software tools.	7 Marks
	b)	Write short notes on various image data types.	7 Marks
		(OR)	
2	a)	Explain various color model s in images.	7 Marks
	b)	Write short notes on Digital Video.	7 Marks

UNIT-II

3		Write an example program to Illustrate Inheritance and Polymorphism in Action script 2.0.	14 Marks
		(OR)	
4	a)	What is class and explain class definition in ACTION SCRIPT?	7 Marks
	b)	Write an example program to illustrate Exception Handling in Action Script 2.0.	7 Marks

UNIT-III

5	a)	What is Interface? Explain about Interface syntax and use.	7 Marks
	b)	Discuss about Exception handling life cycle.	7 Marks
		(OR)	
6		Write an Action Script to convert Indian currency to US dollar with all necessary consideration.	14 Marks

UNIT-IV

7		Describe the steps in the DCT and DFT with a block diagram.	14 Marks
		(OR)	
8	a)	Explain Variable-length Coding with an example.	7 Marks
	b)	Differentiate MPEG-1 and MPEG-2.	7 Marks

UNIT-V

9	a)	How many sub layers are there in ATM? What are they?	7 Marks
	b)	Draw and explain general architecture of Set-top Box.	7 Marks
		(OR)	
10	a)	What are the important parameters of QoS for multimedia data transmission?	7 Marks
	b)	Explain IP-Multicast.	7 Marks

CODE No.:14BT80307 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech II Semester (SVEC14) Supplementary Examinations May – 2022

NON-CONVENTIONAL ENERGY SOURCES

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Explain basics of energy sources and Conservation.	CO1	7 Marks
	b)	Explain energy conservation opportunities.	CO1	7 Marks
		(OR)		
2	a)	Explain the estimation of monthly average, daily total radiation on horizontal surface.	CO2	7 Marks
	b)	Explain the working principle of Pyranometer with a neat sketch.	CO1	7 Marks
		UNIT-II		
3	a)	Define transmissivity of the cover system and transmittance-absorptance product.	CO1	7 Marks
	b)	What is meant by selective surface and how it is important in solar energy collection?	CO1	7 Marks
		(OR)		
4	a)	Explain the efficiency of flat plate collector in detail.	CO1	7 Marks
	b)	Classify types of concentrating collectors.	CO1	7 Marks
		UNIT-III		
5	a)	What are the applications of solar thermal energy?	CO1	7 Marks
	b)	Explain solar pond importance and working principle with neat diagram.	CO1	7 Marks
		(OR)		
6	a)	Explain working principle of H2-O2 cell with neat diagram.	CO3	7 Marks
	b)	Explain arrangements of PV cells and classification of PV cell.	CO3	7 Marks
		UNIT-IV		
7	a)	Explain the construction and working of floating drum type bio gas plant.	CO3	7 Marks
	b)	Illustrate the working principle of horizontal axis wind turbine.	CO3	7 Marks
		(OR)		
8	a)	Derive an expression for maximum power and maximum efficiency from wind.	CO4	7 Marks
	b)	Compare the differences between floating drum and fixed dome bio gas plant.	CO3	7 Marks
		UNIT-V		
9	a)	Illustrate the working of vapor dominated Geo Thermal power plant.	CO1	7 Marks
	b)	Describe the working of double basin tidal power plant.	CO3	7 Marks
		(OR)		
10	a)	Classify Ocean Thermal Energy Conversion systems and explain any one method.	CO4	7 Marks
	b)	How wave energy is converted? Explain any one method neatly.	CO4	7 Marks

CODE No.: 16BT5HS01 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

MANAGEMENT SCIENCE
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Describe the Nature and Importance of Management in Modern Business Context.	CO1	7 Marks
	b)	Discuss the Henry Fayol principles of Management.	CO2	7 Marks
		(OR)		
2.	a)	Discuss critically the principles of Organisation.	CO3	7 Marks
	b)	What do you understand by SWOT analysis?	CO1	7 Marks

UNIT-II

3.	a)	"Product Layout is better than process Layout". Do You agree with this statement? Support your answer.	CO1	7 Marks
	b)	The following information is about the shock absorbers used by automobile workshop: Annual Demand - 4800 Units Unit Price: Rs.300/- Cost of Placing an Order – Rs.50/- Storage Cost 3% Per Annum Interest Rate 15% Per Annum. Calculate: i) EOQ. ii) How many orders to be placed?	CO4	7 Marks
		(OR)		
4.	a)	Define Marketing. Explain the functions of Marketing.	CO1	7 Marks
	b)	For each of the 14 Days, a number of magnets used in electric relays are inspected and the number of defectives is recorded. The total number of magnets tested is 14,000. The following are the particulars of the number of defectives found every day. You are required to construct P chart.	CO4	7 Marks

Day Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Number of Defectives	100	50	150	200	150	50	80	120	60	14	50	70	40	140

UNIT-III

5.	a)	Explain the nature and scope of HRM.	CO1	7 Marks
	b)	What do you understand by Abraham Maslow's theory of Motivation?	CO1	7 Marks
		(OR)		
6.	a)	Identify the role of HR Manager in an Organisation.	CO1	7 Marks
	b)	Explain the methods of Job Evaluation.	CO1	7 Marks

UNIT-IV

7. a) Define Entrepreneurship. Explain the Entrepreneurial Traits. CO5 7 Marks

b) Consider the following activity: CO4 7 Marks

Activity	A	B	C	D	E	F	G	H	I
Predecessor Activity	-	-	A, B	A, B	B	D, E	C, F	D, E	G, H
Time (Days)	30	20	20	20	10	10	40	20	30

i) Draw the Project work.

ii) Identify the Critical Path.

(OR)

8. The following table gives the information about various activities of a project work. CO4 14 Marks

Activity	Normal Duration (Days)	Normal Cost (Rs/-)	Crash Time (Days)	Crash cost (Rs/-)
1-2	9	8,000	7	10,000
1-3	5	5,000	3	8,000
2-3	7	7,000	5	8,600
2-4	8	6,000	6	7,000
3-4	6	9,000	4	11,400

The overhead costs are Rs.1,300 per day. Determine the optimum cost and duration of the project.

UNIT-V

9. a) Explain the basic concepts of MRP. CO6 7 Marks

b) Discuss the concept of Six Sigma. CO1 7 Marks

(OR)

10. a) Explain the Crosby's 14 points of TQM. CO6 7 Marks

b) What do you understand by the concept of Supply Chain Management? CO1 7 Marks

CODE No.: 16BT6HS01 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February – 2021

BANKING AND INSURANCE

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

	UNIT-I		
1.	Explain the importance and functions of Banking.	CO1	14 Marks
	OR)		
2.	What are the goals of Monetary Policy in India? How well they have been achieved in recent times?	CO1 CO2	14 Marks
	UNIT-II		
3.	Outline the Anti Money Laundering. Explain the guidelines on prevention of money laundering.	CO1	14 Marks
	(OR)		
4.	Discuss on the different types of loans and their features in present scenario.	CO2	14 Marks
	UNIT-III		
5.	What do you mean by credit cards? Discuss in detail mechanism, types of credit cards and regulatory framework applicable to credit cards in India.	CO2	14 Marks
	(OR)		
6.	Critically examine the B2B and B2C Business Models with an example.	CO1 CO2	14 Marks
	UNIT-IV		
7.	What is Risk Management? Describe the various methods of handling risks.	CO2	14 Marks
	(OR)		
8.	Discuss the origin and growth of Insurance Industry in India.	CO3	14 Marks
	UNIT-V		
9.	Elaborate on commercial Insurance Contracts.	CO1 CO3	14 Marks
	(OR)		
10.	Explain the role of IRDA in regulating the insurance companies in India. And also explain the insurance players in India.	CO3 CO4	14 Marks

CODE No.: 16BT6HS02 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February – 2021

BUSINESS COMMUNICATION AND CAREER SKILLS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.		Discuss at length with suitable examples the various functions of communication and the role of manager.	CO1	14 Marks
		(OR)		
2.	a)	Elaborate on Interpersonal Communication.	CO5	7 Marks
	b)	What are the various 'Communication Barriers'? How to overcome them?	CO5	7 Marks
		UNIT-II		
3.		Illustrate the concept of cross-cultural communication.	CO4	14 Marks
		(OR)		
4.	a)	Differentiate 'Corporate Citizenship' and 'Corporate Social Responsibility'.	CO2	7 Marks
	b)	Interpret why a plan for handling crisis situation is a must for companies.	CO2	7 Marks
		UNIT-III		
5.		Describe the importance of written business communication with examples. Elaborate on types of business messages.	CO3	14 Marks
		(OR)		
6.	a)	Discuss and illustrate the components of a business letter.	CO1	7 Marks
	b)	What are the various strategies for writing the body of a letter? Discuss.	CO1	7 Marks
		UNIT-IV		
7.		"A resume that has to be sent through e-mail needs to be developed with a specific process." Illustrate.	CO4	14 Marks
		(OR)		
8.	a)	Analyze the basic patterns of the main body/text of the business presentation.	CO2	7 Marks
	b)	Examine online recruitment process.	CO2	7 Marks
		UNIT-V		
9.		Elaborate on the various stages of Campus Interviews and the strategies to be successful in the Interviews.	CO3	14 Marks
		(OR)		
10.	a)	Discuss the various types of interviews and the importance of nonverbal aspects in interviews.	CO5	7 Marks
	b)	Elaborate on types of interviewing questions and the styles of interviewing.	CO5	7 Marks

CODE No.: 16BT6HS11 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February – 2021

PERSONALITY DEVELOPMENT

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Write the process of knowing yourself. Explain with benefits.	CO1	14 Marks
		(OR)		
2.	a)	How your self- image will not be in conflict with your life experiences? Interpret with diagram.	CO1	7 Marks
	b)	Explain stages of self-improvement.	CO3	7 Marks

UNIT-II

3.		Attitude is one of the types of learning. Illustrate.	CO2	14 Marks
		(OR)		
4.	a)	Illustrate how attitudes are influential in relationship?	CO2	7 Marks
	b)	How negative attitude can be modified towards positive attitude?	CO3	7 Marks

UNIT-III

5.		Differentiate between critical thinking and creative thinking.	CO2	14 Marks
		(OR)		
6.	a)	Explain efficient work habits in details.	CO3	7 Marks
	b)	Explain motivation and its sources.	CO4	7 Marks

UNIT-IV

7.		Bring out a few real life situations in an organization for effective communication with supervisor and subordinate.	CO4	14 Marks
		(OR)		
8.	a)	"Ethics is the foundation of leadership". Justify.	CO3	7 Marks
	b)	How criticism can be handled in efficient way?	CO4	7 Marks

UNIT-V

9.		"Safety rules are necessary on workplace". Justify the statement.	CO5	14 Marks
		(OR)		
10.	a)	Describe career goal and its planning.	CO1	7 Marks
	b)	Explain a career path.	CO1	7 Marks

CODE No.: 16BT50303 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

METROLOGY AND MEASUREMENTS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What do you mean by unilateral and bilateral methods of tolerancing? Explain with neat diagrams.	CO1	7 Marks
	b)	Distinguish between clearance and allowance.	CO1	7 Marks

(OR)

2.		A hole and mating shaft are to have a nominal assembly size of 55mm. The assembly is to have a maximum clearance of 0.04mm and a minimum clearance of 0.02mm. The hole tolerance is 1.5 times the shaft tolerance. Determine the limits for both hole and shaft by using hole basis system.	CO2	14 Marks

UNIT-II

3.	a)	With the help of neat sketches, explain how a sine bar is used to determine the taper angle of an inclined surface.	CO1	7 Marks
	b)	What is the working principle of LVDT?	CO1	7 Marks
4.		Describe about mechanical comparator. Write the advantages and disadvantages of the mechanical comparator.	CO4	14 Marks

UNIT-III

5.		In the measurement of surface roughness, heights of 20 successive peaks and valleys from the datum were measured to be 35, 25, 40, 22, 35, 18, 42, 25, 35, 22, 36, 18, 42, 22, 32, 21, 37, 18, 35, 20 microns. Determine the CLA and RMS values of surface roughness over a sampling length of 20mm.	CO3	14 Marks

(OR)

6.	a)	Name the various numerical methods of assessment of surface finish. Explain them in detail with an example.	CO2	7 Marks
	b)	Describe the working principle of an auto collimator.	CO5	7 Marks

UNIT-IV

7.	a)	Explain how effective diameter of screw thread is measured using three wire method. Include the sketches.	CO2	7 Marks
	b)	What is the "best size" wire? Derive an expression for the same in terms of the pitch and angle of the thread.	CO3	7 Marks

(OR)

8.		What are the different methods of measuring gear tooth thickness? Explain the chordal thickness method. Sketch and describe how chordal thickness is measured using gear tooth vernier.	CO5	14 Marks

UNIT-V

9.	a)	Explain working principle of electrical strain gauge with neat sketch.	CO1	7 Marks
	b)	Define Strain Rosette. How it is used for strain measurement?	CO1	7 Marks
		(OR)		
10.	a)	Explain working principle of thermocouples.	CO1	7 Marks
	b)	Explain how pressure can be measured with bourdon tube pressure gauge with a neat sketch.	CO5	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations February - 2021

REFRIGERATION AND AIR CONDITIONING

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. An air refrigerator working on Bell-Coleman cycle takes air into the compressor at 1 bar and 268 K. It is compressed in a compressor to 5 bar and cooled to 298 K at the same pressure. It is further expanded in the expander to 1 bar and discharged to take the cooling load. The isentropic efficiencies of the compressor and expander are 85% and 90% respectively. Determine : (i) Refrigeration capacity of the system if the air circulated is 40 kg/ min; (ii) Power required for the compressor; and (iii) C.O.P of the system. CO2 14 Marks

(OR)

2. a) What is refrigeration? Define one ton of refrigeration. CO1 7 Marks
   b) Determine the temperature ratio for a Carnot refrigerator whose C.O.P is 4. What is the refrigeration capacity of the machine in tons of refrigeration if the power consumption is 7.5 kW. If the cycle is used as a heat pump, find its COP. CO2 7 Marks

UNIT-II

3. A vapour compression refrigeration machine, with Freon-12 as refrigerant, has a capacity of 12 tonne of refrigeration operating between -28^{0}C and 26^{0}C. The refrigerant is subcooled by 4^{0}C before entering the expansion valve and the vapour is superheated by 5^{0}C before leaving the evaporator. The machine has a six-cylinder single-acting compressor with stroke equal to 1.25 times the bore. It has a clearance of 3% of the stroke volume. Determine: (i) Theoretical power required, (ii) C.O.P, (iii) Volumetric efficiency, (iv) Bore and stroke of cylinder. The speed of compressor is 1000 r.p.m. the following properties of Freon-12 may be used: CO2 14 Marks

Temperature ^{0}C)	Pressure bar	Sp. Volume of vapour, m3/kg	Liquid heat (kJ/kg)	Latent heat (kJ/kg)	Entropy of liquid (kJ/kg K)	Entropy of Vapour (kJ/kg K)
-28	1.093	0.1475	10.64	175.11	0.0444	0.7153
26	6.697	0.0262	60.67	198.11	0.2271	0.6865

(OR)

4. a) Mention the advantages of vapour compression refrigeration system over air refrigeration system. CO1 6 Marks
   b) A refrigerating machine using NH3 operates between the temperature limits of -5^{0}C and 30^{0}C. Find the COP of the system. Also find the corresponding value for a reversed Carnot cycle operating between the same temperatures. The properties of NH3 are given below: CO3 8 Marks

Temperature ^{0}C	Pressure bar	Liquid heat (kJ/kg)	Latent heat (kJ/kg)	Entropy of liquid (kJ/kg K)	Entropy of Vapour (kJ/kg K)
-5	2.41	351	1667.5	3.95	9.05
30	11.895	562	1711	4.69	8.48

UNIT-III

5.	a)	What is the function of the following components in an absorption system: i) Absorber. ii) Rectifier. iii) Analyser. iv) Heat exchangers.	CO1	7 Marks
	b)	Derive an expression for the C.O.P. of an ideal vapour absorption system in terms of temperature at which heat is supplied to the generator, the temperature at which heat is absorbed in the evaporator and the temperature at which heat is discharged from condenser and absorber.	CO3	7 Marks

(OR)

6.	a)	Discuss the function of absorber in vapour absorption refrigeration system.	CO1	6 Marks
	b)	Draw a neat line diagram of Electrolux refrigerator and explain its working principle. What is the important role of hydrogen in this refrigeration system?	CO1	8 Marks

UNIT-IV

7.		The following data apply to an air conditioning system: Room sensible heat=41868 kJ/hr room latent heat=41868 kJ/hr; inside design condition= 25^0C, 50% RH, outside design condition=35^0C, DBT, 27.8 WBT. Return air from the room is mixed with the outside air before entering the cooling coil in the ratio of 4:1. Return air from the room is mixed with the cooling air, i.e. after the cooling coil in the ratio of 1:4. Cooling coil by pass factor is 0.1. The air may be reheated if necessary before supplying to the conditioned space. Assume ADP as 10^0C and determine: i) Supply air conditions into the room. ii) Refrigeration load due to the reheat. iii) Total refrigeration capacity. iv) The quantity of fresh air supplied.	CO6	14 Marks

(OR)

8.	a)	Represent the following process in a skeleton psychometric chart. i) Sensible cooling. ii) Cooling and humidification. iii) Adiabatic mixing of air streams.	CO5	6 Marks
	b)	In a laboratory test a psychometer recorded 36^0C DBT and 30^0C WBT calculate the following terms. i) Vapour pressure. ii) Relative humidity. iii) Specific humidity. iv) Degree of saturation. v) Sew point temperature. vi) Enthalpy of the mixture.	CO4	8 Marks

UNIT-V

9.	a)	What are the advantages and disadvantages of spray type dehumidifier over a coil type dehumidifier	CO1	7 Marks
	b)	Explain the use of heat pump for heating and cooling cycle with neat diagram	CO1	7 Marks

(OR)

10.	a)	What is effective temperature? How does it account for human comfort? What is comfort equation?	CO1	7 Marks
	b)	What is the function of fan in air conditioning system? Explain the various types of axial fans.	CO1	7 Marks

CODE No.: 16BT50501 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

COMPUTER NETWORKS

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	List out the various forms of address in TCP Model and map them to OSI Model layers.	CO1	7 Marks
	b)	Compare the functionality of TCP/ IP over OSI Model.	CO1	7 Marks
		(OR)		
2.		Explain the different methods of digital to analog representation methods with neat sketches.	CO1	14 Marks

UNIT-II

3.	a)	Explain the flow control protocols in a noise less channel.	CO2	7 Marks
	b)	Explain the concept of pure ALOHA with flow chart.	CO2	7 Marks
		(OR)		
4.	a)	Calculate the hamming code for x^4+x^3+x+1. Assume even parity.	CO2	7 Marks
	b)	List out the assumptions of dynamic channel allocation and explain each in detail.	CO2	7 Marks

UNIT-III

5.	a)	Draw the header format of IPv6 and explain each field.	CO2	8 Marks
	b)	Compare the concept of virtual circuit and datagram subnets.	CO2	6 Marks
		(OR)		
6.	a)	Describe the concept of class ful addressing in IPv4.	CO3	7 Marks
	b)	Explain the transition strategies of logical addressing.	CO3	7 Marks

UNIT-IV

7.	a)	Draw the header format of UDP and explain each field in detail.	CO2	7 Marks
	b)	Explain the concept of three-way handshaking in connection establishment in TCP.	CO3	7 Marks
		(OR)		
8.		Explain the concept of sliding window protocol in transport layer with and without errors	CO3	14 Marks

UNIT-V

9.	a)	Explain the concept of DNS.	CO2	7 Marks
	b)	Describe the concept of web documents.	CO3	7 Marks
		(OR)		
10.	a)	Explain in brief about the formats of HTTP request and response messages.	CO3	7 Marks
	b)	What is a name server? List and explain the features of various name servers.	CO3	7 Marks

CODE No.: 16BT51203 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

WEB TECHNOLOGIES
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Which HTML tag is used to display the data in a tabular form? Discuss with an example.	CO1	8 Marks
	b)	Describe the use of local storage in HTML5.	CO1	6 Marks
		(OR)		
2.	a)	List new features which were not present in HTML but are added to HTML5 with an example.	CO2	7 Marks
	b)	Illustrate new Form input types in HTML5.	CO1	7 Marks

UNIT-II

3.	a)	Discuss the merits and demerits of Embedded Style Sheets.	CO2	7 Marks
	b)	Describe the need of window object with an example.	CO2	7 Marks
		(OR)		
4.	a)	Elaborate different ways to include jQuery in a page.	CO1	6 Marks
	b)	List and explain different technologies used in AJAX.	CO5	8 Marks

UNIT-III

5.	a)	Briefly discuss about Grid classes in the Bootstrap.	CO5	8 Marks
	b)	Explain about various key components of Bootstrap.	CO5	6 Marks
		(OR)		
6.	a)	Discuss about Bootstrap Badges and Labels.	CO5	7 Marks
	b)	Discuss in detail about various types of layouts available in Bootstrap.	CO5	7 Marks

UNIT-IV

7.	a)	What are the different types of PHP variables? Explain.	CO1	8 Marks
	b)	Discuss various control structures in PHP with its syntax and an example on each of them.	CO4	6 Marks
		(OR)		
8.	a)	Write a PHP script to remove duplicate elements from an array.	CO3	7 Marks
	b)	What is difference between method overriding and method overloading in PHP?	CO3	7 Marks

UNIT-V

9.	a)	Write short note on Session Tracking.	CO6	5 Marks
	b)	Discuss and give an example on how to retrieve HTML Form Data with PHP.	CO4	9 Marks
		(OR)		
10.	a)	Describe how transactions are managed in PHP.	CO3	7 Marks
	b)	Illustrate how Cookies are created and retrieved in PHP.	CO4	7 Marks

CODE No.: 16BT51501 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

COMPILER DESIGN

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain about compiler construction tools in detail.	CO5	7 Marks
	b)	Define Interpreter. Explain about Recursive and Iterative interpreters.	CO1	7 Marks

(OR)

2.	a)	Explain the input buffer scheme for scanning the source program. How the use of sentinels can improve its performance?	CO1	8 Marks
	b)	Explain the role of the lexical analyzer.	CO5	6 Marks

UNIT-II

3.		Write an algorithm for construction of a predictive parsing table. And construct a predictive parsing table for the following grammar: $E \rightarrow T\ E^I$ $E^I \rightarrow +\ T\ E^I \mid €$ $T \rightarrow F\ T^I$ $T^I \rightarrow *\ F\ T^I \mid €$ $F \rightarrow (\ E\ ) \mid id$	CO3	14 Marks

(OR)

4.		Convert the following grammar into LL(1) grammar and construct the LL(1) Parsing table. bexpr → bexpr or bterm | bterm bterm → bterm and bfactor | bfactor bfactor → not bfactor | (bexpr) | true | false	CO3	14 Marks

UNIT-III

5.	a)	Write a note on the type equivalence using example.	CO4	7 Marks
	b)	What is a type conversion? Explain the type conversion with an appropriate example.	CO1	7 Marks

(OR)

6.	a)	Construct the syntax tree for an arithmetic expression a * (b + c) .	CO3	7 Marks
	b)	Write short notes on the following. i) S – attributed definitions. ii) L – attributed definitions .	CO4	7 Marks

UNIT-IV

7.		Explain about Block and Non Block structure storage allocation for: i) Dynamic scoping. ii) Parameter passing mechanisms.	CO6	14 Marks

(OR)

8.	a)	Write about different data structures suitable for Symbol Table.	CO1	7 Marks
	b)	Generate the three-address code for the following C program fragment ***while(a > b)*** ***{*** ***if (c < d) x = y + z;*** ***else x = y - z;*** ***}***	CO2	7 Marks

UNIT-V

9.	a)	What is a flow graph? Explain how a given program can be converted into a flow graph.	CO3	7 Marks
	b)	What are the various machine dependent code optimization techniques?	CO2	7 Marks

(OR)

10.		Explain about Code-Generation algorithm.	CO2	14 Marks

CODE No.: 16BT60118 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February – 2021

RURAL TECHNOLOGY

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Rama wants to grow cotton in his crop field through traditional method in Hosoor village. What is the process involved from sowing seeds to storage?	CO1	7 Marks
	b)	Explain the role of technology poverty eradication in rural development.	CO1	7 Marks

(OR)

2.	a)	Thandrapadu is one of the backward village in Kurnool district with lack of infrastructure facilities. Choose the technology that can improve the rural infrastructure.	CO4	7 Marks
	b)	Write about various organizations related to innovation of technology for rural development.	CO2	7 Marks

UNIT-II

3.	a)	Day by day waste generation is increasing more and to minimize this waste 3R principle use is necessary. What is meant by 3R principle? State the advantages of 3R principle.	CO4	7 Marks
	b)	Kumar is a young doctorate in mechanical engineering from NIT Tirchy and carried out of his research in renewable energy sources. He wants to implement his ideas in rural areas. How can he help rural areas in using solar energy?	CO4	7 Marks

(OR)

4.	a)	The increase of wood waste and animal waste is more in the village Ramapuram which is near to the forest area. Show how the waste can use by the rural people with the technology for cooking.	CO4	7 Marks
	b)	Explain the process, advantages and disadvantages of biogas.	CO2	7 Marks

UNIT-III

5.	a)	Define tissue culture. Explain briefly how the production of one of the ornamental plant orchids can be increased by the plant tissue culture.	CO4	7 Marks
	b)	Explain the building materials used in the rural areas.	CO2	7 Marks

(OR)

6.		The government of India is giving training to the rural women who are unemployed. Discus in detail the rural of cottage industries in rural development.	CO1	14 Marks

UNIT-IV

7.	a)	Raghunath is an agricultural scientist wants to give awareness to the rural people about the usage of organic fertilizers in the crop field. Suggest the importance uses of bio fertilizer.	CO6	7 Marks
	b)	Explain methodologies used for water conservation in rural development.	CO1	7 Marks

(OR)

8.	a)	Write the importance of medical and aromatic plants and explains their need in community development.	CO5	7 Marks
	b)	Explain the importance of environment and sanitation in community development.	CO4	7 Marks

UNIT-V

9.	a)	What is meant by CSR? How development can be achieved with the involvement of private sector participation in the rural area?	CO3	7 Marks
	b)	Write short note on village adoption schemes in India.	CO2	7 Marks

(OR)

10.		Information technology for the rural development is a boon or bane and applies its principle for a specific purpose.	CO2	14 Marks

CODE No.: 16BT60501 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February – 2021

SOFTWARE TESTING
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Differentiate error, bug, defect, fault, failure, testware and incident giving examples of each.	CO2	7 Marks
	b)	List the states of software bug.	CO1	7 Marks
		(OR)		
2.	a)	Explain software testing methodology.	CO1	7 Marks
	b)	Describe about testing life cycle model.	CO1	7 Marks

UNIT-II

3.	a)	Explain cyclomatic complexity in with example.	CO1	8 Marks
	b)	Explain guidelines for basic path testing.	CO1	6 Marks
		(OR)		
4.	a)	Explain about the different criteria for logic coverage.	CO1	8 Marks
	b)	How do you calculate the number of decision nodes foe switch-case?	CO1	6 Marks

UNIT-III

5.	a)	With a neat sketch, explain the decision table.	CO1	7 Marks
	b)	A program calculates the total salary of an employee with the conditions that if the working hours are less than or equal to 48, then give normal salary. The hours over 48 on normal working days are calculated at the rate of 1.25 of the salary. However, on holidays or Sundays, the hours are calculated at the rate of 2.00 times of the salary. Design test cases using decision table testing.	CO3	7 Marks
		(OR)		
6.	a)	What is an immaterial case? Explain its role in decision tables.	CO1	7 Marks
	b)	List the steps involved in checking the consistency and completeness of specifications using decision tables.	CO2	7 Marks

UNIT-IV

7.	a)	Illustrate the major activities in V and V planning.	CO1	7 Marks
	b)	Discuss the role of users/clients in preparing the test plans.	CO1	7 Marks
		(OR)		
8.	a)	Justify the role of classifying software metrics on monitoring the progress of the software project.	CO4	7 Marks
	b)	What type of projects can be best counted with function point analysis?	CO1	7 Marks

UNIT-V

9.	a)	With a neat diagram, explain the selective retest technique.	CO1	7 Marks
	b)	Design test cases by using regression testing to produce quality software.	CO5	7 Marks
		(OR)		
10.		Implement data driven testing on flight reservation application using regression testing tool.	CO6	14 Marks

CODE No.: 16BT60501 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

SOFTWARE TESTING

[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.		Explain the model of testing in detail. Also render software testing life. Cycle model. Justify whether complete testing is possible or not.	CO1	14 Marks
		(OR)		
2.	a)	List the goals of software testing	CO2	7 Marks
	b)	Describe the features of software testing methodology.	CO2	7 Marks
		UNIT-II		
3.	a)	Discuss on Loop testing and Data flow testing techniques in detail.	CO2	7 Marks
	b)	Explain about unit testing with an example.	CO1	7 Marks
		(OR)		
4.	a)	A program calculates the GCD of three numbers in the range [1, 50]. Design test cases for this program using BVC, robust testing and worst-case testing methods.	CO4	7 Marks
	b)	Explain in detail about Cyclomatic Complexity. Illustrate with an example.	CO1	7 Marks
		UNIT-III		
5.	a)	Explore on State Table based testing and Error guessing.	CO2	7 Marks
	b)	What is the need for minimizing test cases in a project? Illustrate with an example.	CO3	7 Marks
		(OR)		
6.	a)	Explain Bottom-up Integration testing with suitable example and compare it with Top-Down Integration.	CO1	7 Marks
	b)	How do you represent Graph matrices for testing process? Device the same with example.	CO4	7 Marks
		UNIT-IV		
7.	a)	What is Test Suit Prioritization? How should prioritize test cases in Software Testing?	CO3	7 Marks
	b)	Explain the steps involved in automated testing process.	CO5	7 Marks
		(OR)		
8.	a)	List the difference between size oriented metrics and function point analysis metrics.	CO2	7 Marks
	b)	Discuss the key components of test management.	CO1	7 Marks
		UNIT-V		
9.	a)	Explain about testing of web based systems.	CO5	7 Marks
	b)	What are the different regression testing tools and techniques? Explain in detail.	CO5	7 Marks
		(OR)		
10.	a)	List the quality aspects of a website and perform performance testing for it.	CO6	7 Marks
	b)	List and explain various guidelines Automated testing.	CO6	7Marks

CODE No.: 16BT61201 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

CLOUD COMPUTING
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Does VMM acts as an interface in virtualization? Justify.	CO5	7 Marks
	b)	Define Virtualization and explain the taxonomy of virtualization.	CO1	7 Marks
		(OR)		
2.		Compare and Contrast any two virtualization technologies of Cloud Computing.	CO4	14 Marks

UNIT-II

3.	a)	Illustrate about various services of Cloud Computing with a neat sketch.	CO3	7 Marks
	b)	List and explain five characteristics of Cloud.	CO1	7 Marks
		(OR)		
4.	a)	List and explain various risks and challenges in Cloud.	CO1	7 Marks
	b)	Define Cloud Computing as per NIST and explain the origin of Cloud.	CO1	7 Marks

UNIT-III

5.		Outline the following Cloud Enabled Technologies. i) Cloud Bursting. ii) Load Balancing. iii) Elastic Resource Capacity.	CO4	14 Marks
		(OR)		
6.		Analyse various components in Cloud Architecture and explain each in detail.	CO4	14 Marks

UNIT-IV

7.	a)	Compare and contrast SaaS and IaaS based on their services.	CO4	7 Marks
	b)	Explain in detail on Capacity Planning and Cloud Scale.	CO1	7 Marks
		(OR)		
8.		Briefly explain the following. i) Host Security. ii) Network Security.	CO2	14 Marks

UNIT-V

9.		Design and develop bucket instance with 4GB storage space using Amazon Simple storage service Cloud.	CO5	14 Marks
		(OR)		
10.		Sales force is a Cloud Computing service specializes in Customer Relationship Management (CRM). Justify the above statement and list few benefits of CRM.	CO6	14 Marks

CODE No.: 16BT61503 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February – 2021

SOFTWARE PROJECT MANAGEMENT
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Briefly explain waterfall model by stating its merits and demerits.	CO1	7 Marks
	b)	How do we achieve the required software quality?	CO1	7 Marks
		(OR)		
2.	a)	Explain how improvement in software processes will reduce cost.	CO1	7 Marks
	b)	How do we improve team effectiveness?	CO1	7 Marks
		UNIT-II		
3.		Explain the essential activities in the transition phase. Explain how you control them effectively in project.	CO1	14 Marks
		(OR)		
4.		Describe in detail about Engineering and production stage.	CO1	14 Marks
		UNIT-III		
5.		In detail write the artifact set for software project management	CO2	14 Marks
		(OR)		
6.		What is work flow? Explain various levels of software process work flows.	CO4	14 Marks
		UNIT-IV		
7.	a)	Explain in detail about periodic status assessments.	CO3	7 Marks
	b)	What are the fundamental flaws in Conventional Work Breakdown Structures? Write the solution to overcome these flaws.	CO4	7 Marks
		(OR)		
8.	a)	Briefly explain cost and schedule estimating process.	CO3	7 Marks
	b)	What is meant by "line of business organizations"? Write the roles and responsibilities of these organization people.	CO4	7 Marks
		UNIT-V		
9.		Briefly explain Seven core metrics related to project control.	CO5	14 Marks
		(OR)		
10.		What are the roles of project manager in the agile management?	CO6	14 Marks

CODE No.: 16BT70101 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

ESTIMATION AND QUANTITY SURVEYING
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. Estimate the detailed quantity for the following items of two roomed building from the given plan and cross section as shown in Fig.1. By using long wall and short wall method. CO4 14 Marks
   i) Earth work excavation.
   ii) Brick work in CM (1:4) for substructure up to plinth level.
   iii) R.C.C. slab with (1:1.5:3)
   iv) Inside Plastering in cm (1:5) with 12 mm thick.

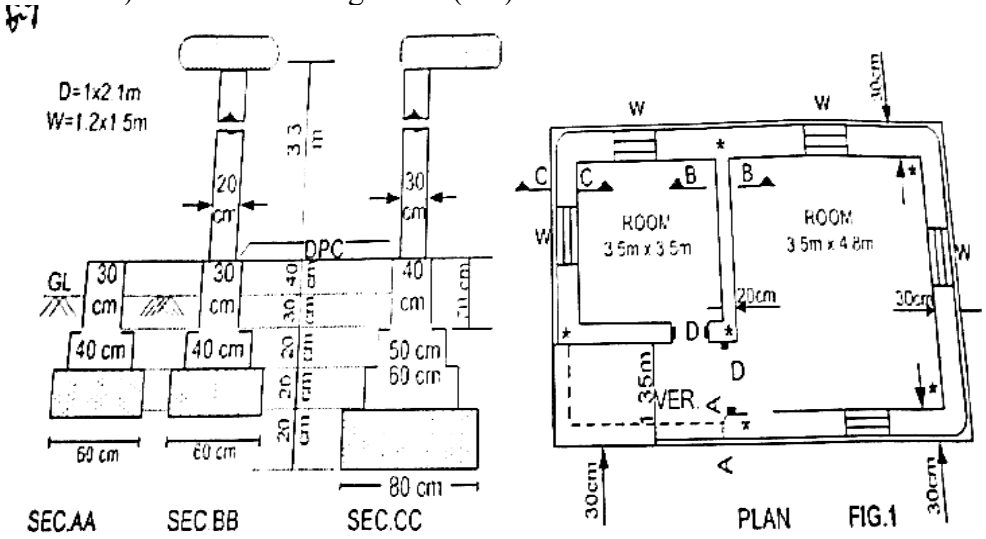


Fig. 1

(OR)

2. a) Define estimate? List out the various quantity surveying for residential building along with units. CO1 10 Marks
   b) Clearly distinguish between long wall and short wall method. CO1 4 Marks

UNIT-II

3. a) Calculate the quantity of earth work for 350 meter length for a portion of road in a uniform ground the heights of banks at the two ends being 1.00 meter and 1.75 meters. The formation width is 12.0 meters and side slopes 2:1 (Horizontal: Vertical). Assume that there is no transverse slope. Use the following methods and justify which method is good. CO4 8 Marks
      (i) Mid sectional area method
      (ii) Prismoidal formula.
   b) Calculate the quantity of cement concrete for cement concreting two kilometers length of 7.50 meters wide road for 8.50 cm thick layer. And also prepare a detailed estimate. Cost at the rate of Rs.750.00 per cu.m. CO2 6 Marks

(OR)

4.		Prepare a detailed estimate for supplying, laying and jointing 300mm diameter glazed stone ware pipe line jointing with 1:3 cement mortar. Measurement of trench is 600m x 0.9m x 0.8m, sand filling with 230mm depth around the pipe.	CO2	14 Marks

UNIT-III

5.		Workout cost per unit for the following items of work. i) Brick work in CM (1:6) for foundation. ii) PCC in 1:3:6 for foundation. iii) R.C.C for M20 grade concrete (1:1.5:3). iv) Painting for walls.	CO6	14 Marks

(OR)

6.	a)	What is the purpose and method of writing specification? Describe briefly general and detailed specification.	CO1	8 Marks
	b)	What is the necessity and importance of the specification related to civil engineering constructions?	CO5	6 Marks

UNIT-IV

7.	a)	Discuss in brief about different contracts.	CO1	8 Marks
	b)	What is meant by arbitration? Explain advantages of setting the disputes by arbitration.	CO1	6 Marks

(OR)

8.	a)	A building is to be constructed on a site of dimensions 30m x 20m. Prepare a contract document for the construction of the building.	CO7	8 Marks
	b)	Summarize the contents of contract document.	CO1	6 Marks

UNIT-V

9.		A three storied building has been constructed on a plot of land measuring 800m^2. The plinth area of each story is 400m^2. The life of the building structure may be taken as 70 years. The building fetches a gross rent of Rs 5000/- per month. Calculate the capitalized value of the property on the basis of 10% net yield. For sinking fund 3% compound interest may be assumed. Cost of land may be taken as Rs 500/- per m^2, other data required may be assumed suitably.	CO3	14 Marks

(OR)

10.	a)	What do you mean by valuation and explain various purposes of valuation.	CO1	10 Marks
	b)	Explain capitalized value with example.	CO8	4 Marks

CODE No.: 16BT70102 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

GEOSPATIAL TECHNOLOGIES

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define Arerial Photogrammetry and its types.	CO1	7 Marks
	b)	Explain determination of scale of Aerial Photographs.	CO1	7 Marks
		(OR)		
2.		Explain briefly about methods of mosaicing.	CO2	14 Marks

UNIT-II

3.		Review in detail about the various elements of image interpretation in remote sensing.	CO3	14 Marks
		(OR)		
4.	a)	Explain the various Energy Interactions with Earth's surface and atmosphere.	CO3	7 Marks
	b)	Explain are the types of Remote Sensing Platforms.	CO3	7 Marks

UNIT-III

5.	a)	Explain the hardware and software components of GIS.	CO1	7 Marks
	b)	Distinguish between Raster GIS and Vector GIS.	CO2	7 Marks
		(OR)		
6.		Write the polyconic projection of traformation of map.	CO2	14 Marks

UNIT-IV

7.	a)	Write overview of data management in GIS.	CO4	7 Marks
	b)	Explain functions of Global Positioning System.	CO4	7 Marks
		(OR)		
8.		Evaluate various surface analysis tools and explain the slope analysis in GIS.	CO6	14 Marks

UNIT-V

9.	a)	Elaborate the application of GIS in traffic congestion analysis.	CO5	7 Marks
	b)	Enumerate the applications of Watershed management for sustainable management.	CO7	7 Marks
		(OR)		
10.		Brief on land use land cover classification.	CO5	14 Marks

CODE No.: 16BT70103 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

RAILWAY, AIRPORT AND HARBOUR ENGINEERING

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss different types of rail joints with help of neat sketches and give their merits and limitations.	CO1	7 Marks
	b)	Discuss merits and limitations of railways.	CO1	7 Marks

(OR)

2.	a)	How do you define super elevation? What are the objectives of providing super elevation on a railway track?	CO1	7 Marks
	b)	If a 8^0 curve track diverges from a main curve of 50 in an opposite direction in the layout of a standard gauge track. Calculate the super elevation and speed on the branch line, if the maximum speed permitted on the main line is 45 kmph.	CO3	7 Marks

UNIT-II

3.	a)	Summarize how poor soil is being stabilized and explain the methods in detail.	CO5	7 Marks
	b)	Discuss the materials required for track laying and list the factors considered in the construction of railway track.	CO6	7 Marks

(OR)

4.	a)	Describe the different types of marshaling yards with neat sketches.	CO4	7 Marks
	b)	What is a gradient? What are they provided on railway track? How are they classified?	CO5	7 Marks

UNIT-III

5.	a)	Draw a neat sketch of aeroplane showing its parts. Also explain the functions of the component parts.	CO1	7 Marks
	b)	What are the factors affecting airport operating capacity?	CO4	7 Marks

(OR)

6.	a)	Explain about different types of surveys for site selection.	CO3	7 Marks
	b)	What are the essential features of a runway lightning system?	CO3	7 Marks

UNIT-IV

7.	a)	What is basic runway length? How it is determined and what are the corrections applied?	CO3	7 Marks
	b)	The length of runway under standard conditions is 1620m. The airport site has an elevation of 270m. Its reference temperature is 32.90^0C. If the runway is to be constructed with an effective gradient of 0.20%. Determine the corrected runway length.	CO3	7 Marks

(OR)

8.	a)	Write the construction procedure of the wind rose diagram.	CO3	6 Marks
	b)	Determine length of runway under standard conditions is 1900m the airport is to be provided at an elevation of 400m above the mean sea level. The airport reference temperature is 40^0C. If the runway is to be constructed with an effective gradient of 0.4%, determine the corrected runway length.	CO3	8 Marks

UNIT-V

9.	a)	Explain the function and role of dry docks in detail.	CO1	7 Marks
	b)	Explain working principle of Light House with neat sketch.	CO1	7 Marks

(OR)

10.	a)	Explain the classification of ports and enumerate the factors involved in site selection.	CO1	7 Marks
	b)	Mention the benefits and constraints of Water Transportation.	CO1	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February – 2021

ADVANCED FOUNDATION ENGINEERING

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain Vesic's theory of bearing capacity. How it differ from the Terzaghi's bearing capacity theory?	CO1	8 Marks
	b)	Consider a square footing of size 2m x 2m constructed on saturated clay. The depth of the foundation is 1.5m and rock layer is at a depth of 0.75m from base of the footing. The clay is having γ = 18kN/m^3, C_u = 60kN/m^2 and ϕ = 0^0. Estimate the ultimate bearing capacity of foundation. Take F.S = 3.	CO2	6 Marks

OR)

2.	a)	Explain the 3-dimensional consolidation theory of settlements.	CO2	8 Marks
	b)	Find the dimensions of a square footing which carries a column load of 480kN. The dimensions of the columns is 0.4m x 0.4m and the allowable bearing pressure of soil is 100kPa.	CO2	6 Marks

UNIT-II

3.	a)	How the point bearing resistance of the pile is determined from SPT and CPT tests?	CO5	8 Marks
	b)	Determine the load carrying capacity of a cast in-situ pile of length 15m and size 0.5m x 0.5m constructed in a clayey soil with average C_u = 50kN/m^2 and γ = 17.5kN/m^3.	CO2	6 Marks

(OR)

4.	a)	Explain the load carrying capacity of the pile by using α-method for cohesive soils.	CO1	7 Marks
	b)	Explain in brief about the ultimate capacity of pile groups during pull out and lateral loads.	CO1	7 Marks

UNIT-III

5.	a)	What is a sheet pile wall? Explain the procedure for determining the embedment depth of free cantilever sheet pile wall.	CO2	7 Marks
	b)	A bulk head with free earth support retains cohesion-less soil up to a height of 5m. The soil have frictional angel of 20^0, unit weigh of 19kN/m^3. Determine the force developed in the tie rod placed at 1 m below the top of the surface.	CO3	7 Marks

(OR)

6.	a)	With an aid of neat sketch, explain the procedure for determining the embedded depth required for a bulk head with fixed earth support.	CO1	7 Marks
	b)	A cantilever sheet pile wall supporting a cohesive soil up to a height of 6 above the dredge level. The soil has C_u = 35kN/m^2 and γ = 17kN/m^3. Determine the depth embedded. Take F.S = 1.	CO3	7 Marks

UNIT-IV

7.	a)	What is an expansive soil? Explain the foundation problems associated with it.	CO1	7 Marks
	b)	Explain about: i) CNS layer. ii) Classification of expansive soil.	CO4	7 Marks

(OR)

8.	a)	Explain the lime column techniques in expansive soil.	CO4	7 Marks
	b)	With an aid of neat sketch, explain the construction procedure of under-reamed pile foundation. Give out an expression for determining the load carrying capacity for a double bulb under-reamed pile foundation.	CO1	7 Marks

UNIT-V

9.	a)	Explain in brief about ship impact on pilled wharf structure.	CO1	7 Marks
	b)	What is a breakwater? Explain in brief about rubble mount break water and wall type break water.	CO2	7 Marks

(OR)

10.		Briefly explain the following terms: i) Quay walls. ii) Wharves. iii) Docks. iv) Piers.	CO1	14 Marks

CODE No.: 16BT70106 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February – 2021

ENVIRONMENTAL IMPACT ASSESSMENT AND MANAGEMENT

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain main stages of EIA process.	CO1	7 Marks
	b)	Discuss about the need of EIA in engineering projects.	CO1	7 Marks
		(OR)		
2.	a)	What are the Elements of EIA?	CO1	7 Marks
	b)	What is Initial environmental examination?	CO1	7 Marks

UNIT-II

3.	a)	Explain network method of EIA.	CO2	7 Marks
	b)	Explain matrix method of EIA.	CO2	7 Marks
		(OR)		
4.	a)	Explain the criteria for the selection of EIA methodology.	CO2	7 Marks
	b)	Explain matrix method of EIA.	CO2	7 Marks

UNIT-III

5.	a)	Explain the methodology for the assessment of Soil.	CO3	7 Marks
	b)	Discuss the need for public awareness on EIA.	CO3	7 Marks
		(OR)		
6.	a)	What are the mitigation measures to be taken for reducing the impact on surface water quality by the use of agricultural chemicals?	CO3	7 Marks
	b)	Explain impacts on surface water environment.	CO3	7 Marks

UNIT-IV

7.	a)	What are the causes and effects of Deforestation?	CO4	7 Marks
	b)	What is the necessity of delineation of study area of EIA?	CO4	7 Marks
		(OR)		
8.	a)	Explain the generalized approach for assessment of air pollution impact.	CO4	7 Marks
	b)	Explain the impact of developmental activities on vegetation.	CO4	7 Marks

UNIT-V

9.	a)	Explain the Types of environmental audit.	CO5	7 Marks
	b)	Explain briefly about Air Act and Water Act.	CO5	7 Marks
		(OR)		
10.		Explain one case study on EIA in Industries.	CO5	14 Marks

CODE No.: 16BT70110 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations February - 2021

WATER RESOURCES SYSTEMS PLANNING AND MANAGEMENT

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Describe the concept of system analysis to water resources applications. CO1 7 Marks
   b) Explain the system approach to water resources system management. CO1 7 Marks

(OR)

2. a) What is the role of constraints in modeling of water resources systems? CO2 7 Marks
   b) Discuss the applicability of different optimization techniques used in water resources systems. CO2 7 Marks

UNIT-II

3. a) Give a general mathematical formulation of LPP. Explain all terms. CO2 7 Marks
   b) Solve the following LPP by using graphical method. CO4 7 Marks
   Maximize $\mathbf{Z = 2x_1 + 3x_2}$
   Subjected to constraints
   $\mathbf{2x_1+x_2 \leq 2}$
   $\mathbf{3x_1+4x_2 \geq 12}$
   $\mathbf{x_1, x_2 \geq 0}$

(OR)

4. Solve the following LPP. CO4 14 Marks
   Maximize $\mathbf{Z = x_1 + 4x_2}$
   Subjected to constraints
   $\mathbf{3x_1 + x_2 \leq 3}$
   $\mathbf{2x_1 + 3x_2 \leq 6}$
   $\mathbf{4x_1 + 5x_2 \geq 20}$
   $\mathbf{x_1, x_2 \geq 0}$

UNIT-III

5. a) Explain Bellman's principle of optimality. CO5 7 Marks
   b) What is the role of dimensionality in dynamic programming problem. CO5 7 Marks

(OR)

6. Solve the following 4-user water allocation problem to maximize the total returns using **backward recursion** of dynamic programming water available foe allocation = 60units, to be allocated in discrete units of 0, 10, 20 ….. 60. Returns from the four users for a given allocation are given in the table below. CO4 14 Marks

Allocation	Returns from			
	User 1	User 2	User 3	User 4
0	0	0	-3	1
10	3	4	3	1
20	5	4	5	1
30	6	4	5	7
40	3	4	4	8
50	3	6	2	10
60	3	7	0	10

UNIT-IV

7.		Minimize $Z=2x_1^2+x_2^2+3x_3^2+10x_1+8x_2+6x_3-100$ subject to $x_1+x_2+x_3=20$ $x_1, x_2 \geq 0$	CO4	14 Marks

(OR)

8.	a)	Explain any one classical method of optimization with suitable example.	CO5	7 Marks
	b)	What is the procedure for applying simulation in water resource planning?	CO5	7 Marks

UNIT-V

9.		There are two alternatives to water supply in an irrigation district. Plan A is to construct an open channel at an initial cost of Rs. 50 lakhs with O and M cost of Rs. 4 lakhs per year. The alternative plan B is to go for a piping system at an initial cost of Rs.90 lakhs and an O and M cost of Rs. 50000 per year. Money is available for 6% interest rate and sinking fund will improve at 4% interest. Useful life of the project in both cases is 20 years. Select the more economical of the two alternatives.	CO8	14 Marks

(OR)

10.	a)	What are the economics considered in planning of reservoir system?	CO7	7 Marks
	b)	Explain the concept of conjunctive use of surface and sub-surface water resources.	CO6	7 Marks

CODE No.: 16BT70112 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations February - 2021

EARTHQUAKE RESISTANT DESIGN OF STRUCTURES

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain in detail any five Building characteristics that are to be considered during the earthquake resistant design.	CO1	7 Marks
	b)	Define lateral load resisting system and explain its types.	CO1	7 Marks

(OR)

2.	a)	Explain about Response reduction factor and Zone factor during the seismic analysis.	CO2	7 Marks
	b)	Explain about various classifications of earthquakes. Explain in detail about magnitude and intensity of earthquakes.	CO1	7 Marks

UNIT-II

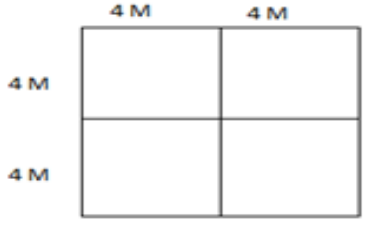
3.		Derive the equation of motion of SDOF system for free vibration and find the solution for: i) Under damped system. ii) Over damped system. iii) Critically damped system.	CO2	14 Marks

(OR)

4.	a)	Explain about the importance of ductility and what are the general requirements of ductility.	CO4	7 Marks
	b)	Define Ductility and explain various types of Ductility in detail.	CO2	7 Marks

UNIT-III

5.	a)	Explain the step by step procedure for seismic design coefficient method in detail.	CO4	7 Marks
	b)	The plan and elevation of a 2, 3 story RCC college building. The building is in 36% of Peak Ground Acceleration (PGA) or very serious seismic intensity. The type of soil encountered is medium stiff and it is proposed to design the building with a frame meeting ductile requirement of RC building. The intensity of DL is 10kN/m^2 and Intensity of Live load of floors is 3kN/m^2. Determine the design seismic loads on the structure by static analysis.	CO2	7 Marks



PLAN

ELEVATION

(OR)

6. For an RCC (OMRF, not conforming to ductile detailing requirements) building frame for office the loads on the floors are DL (including equivalent weight of brick infill masonry 8kN/m² on each floor and 7.5kN/m² on roof, LL = 4kN/m² on each floor and 1.5kN/m² on roof. The story heights are ground story = 4.2m, first story = 3.2m, second story = 3.2m and third story = 3.2m. The building frame is of four bays of each 5m in both directions and founded on hard soil, situated in zone IV. The plan dimensions of the building are 20m x 20m and the total height of the building is 13.8m. The damping in the structure is 7%. Determine the seismic forces by:
   i) Equivalent lateral force procedure considering the framed structure.
   ii) The stiffness of brick masonry infill, neglecting the stiffness of brick masonry infill. Compare the results of both the cases and explain.

CO1 14 Marks

UNIT-IV

7. a) Explain about the ductile detailing of beam as per IS 13920-2016 recommendations. CO4 7 Marks

   b) An inner beam of 300mm x 600mm with span 6m of a RC frame having a negative moment of 300kN-m and a shear force of 250kN at the face of beam column joint due to gravity and earthquake loads. Design the beam for ductility. Consider M25 and Fe415 CO1 7 Marks

(OR)

8. a) Explain about Plan Configuration and Torsion Irregularities in a multi storied structure. CO6 7 Marks

   b) Define load path and explain about vertical discontinuities in load path. CO6 7 Marks

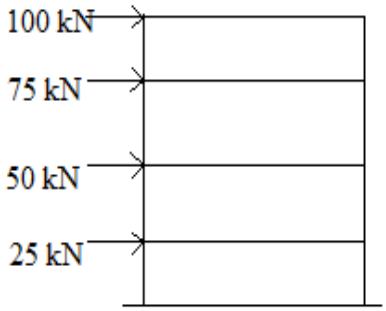
UNIT-V

9. a) Explain about period shifting of structure and mode of vibration in base isolation technique. CO3 7 Marks

   b) Explain about Hydraulic dampers and Viscous dampers in detail. CO1 7 Marks

(OR)

10. Design a ductile shear wall of an effective length 6.4m to resist seismic forces using M25 and Fe415. The beams and columns are 600mm x 300mm. Each floor is of 3m. The seismic shear forces for each floor is shown in figure. Axial load acting on the building is 1000kN. CO3 14 Marks



❀ ❀ ❀

CODE No.: 16BT70113 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

HIGHWAY CONSTRUCTION AND MAINTENANCE

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain various steps involved in the construction of WBM roads.	CO2	7 Marks
	b)	Explain the construction of cement concrete pavements in detail.	CO2	7 Marks
		(OR)		
2.	a)	Explain the construction of expansion and contraction joints in cement concrete pavement in detail.	CO2	7 Marks
	b)	Explain various steps in construction of a new highway pavement.	CO1	7 Marks

UNIT-II

3.	a)	Write a detailed note on soil-lime stabilization.	CO5	7 Marks
	b)	Write a detailed note on various special problems encountered during soil stabilization work.	CO1	7 Marks
		(OR)		
4.	a)	Explain the process of mechanical stabilization in detail.	CO5	7 Marks
	b)	Write a detailed note on various properties of soil aggregate mixes to be considered in soil stabilization.	CO1	7 Marks

UNIT-III

5.	a)	Explain the importance and various requirements of highway drainage.	CO3	7 Marks
	b)	Explain the construction of highway drainage in case of water logged areas.	CO3	7 Marks
		(OR)		
6.	a)	Write a detailed note on various factors effecting highway alignment in hilly roads.	CO7	7 Marks
	b)	Explain various problems encountered in maintenance of drainage in hilly areas.	CO1	7 Marks

UNIT-IV

7.		Write a short note on uses, advantages and limitations of the following equipment's. i) Bull Dozer. ii) Scrapper.	CO5	14 Marks
		(OR)		
8.		Discuss in detail various types of pile driving equipment available with neat sketch.	CO5	14 Marks

UNIT-V

9.	a)	Explain various failures in flexible pavements with neat sketch.	CO2	7 Marks
	b)	Write a detailed note on various ways to strengthen existing highway pavements by means of overlays.	CO4	7 Marks
		(OR)		
10.	a)	Explain various environment factors to be considered while planning and development of highways.	CO8	7 Marks
	b)	Write short notes on road side development and arboriculture.	CO6	7 Marks

CODE No.: 16BT70114 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

INDUSTRIAL WASTEWATER TREATMENT

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Draw and explain a typical oxygen sag curve in a stream subjected to pollution.	CO1	7 Marks
	b)	Explain the oxygen sag curve in streams when industrial wastewater is disposed into streams.	CO1	7 Marks
		OR)		
2.	a)	How are the characteristics of industrial waste water expressed?	CO1	7 Marks
	b)	What is the importance of dissolved oxygen which is present in water? How does it help for the treatment of waste water? How the dissolved oxygen level is maintained in the stream?	CO1	7 Marks

UNIT-II

3.	a)	Draw the neat sketch and describe briefly about the growth phases of microorganisms.	CO2	7 Marks
	b)	Define the mean cell residence time. Determine the mean cell residence time if volume of the aeration tank is 5000m^3 with MLSS concentration 2000 mg/l is maintained and the underflow concentration is 10000 mg/l and about 50m^3/day sludge is wasted.	CO2	7 Marks
		(OR)		
4.	a)	Draw flow sheets and explain contact stabilization process.	CO2	7 Marks
	b)	Explain the significant design criteria and steps for designing a conventional activated sludge process.	CO2	7 Marks

UNIT-III

5.	a)	What are the various empirical equations used for the design of trickling filters? State the limitations of these equations.	CO3	7 Marks
	b)	Explain briefly the nitrogen removal by biological nitrification and denitrification.	CO3	7 Marks
		(OR)		
6.	a)	Explain the oxidation and reduction treatment systems in detail.	CO3	7 Marks
	b)	Explain the different types of anaerobic treatment processes. Anaerobic treatment is not generally accepted for wastewater treatment. Why?	CO3	7 Marks

UNIT-IV

7.	a)	What is the purpose of equalization? What are the methods of equalization and explain any two methods of mixing?	CO4	7 Marks
	b)	What is the purpose of neutralization? What are the methods of neutralization?	CO4	7 Marks
		(OR)		
8.	a)	How to control industrial waste water by neutralization? What are its advantages?	CO4	7 Marks
	b)	Describe the massive lime Treatment for color Removal in pulp and paper mill.	CO4	7 Marks

UNIT-V

9.	a)	Explain the impact of distillery effluent on aquatic environment if discharged without treatment.	CO5	7 Marks
	b)	What are the merits and demerits of common effluent treatment plants?	CO5	7 Marks
		(OR)		
10.	a)	Draw a neat sketch of the process of Tanneries Industry.	CO5	7 Marks
	b)	Give the values of different characteristics of Tanneries Industry waste.	CO5	7 Marks

CODE No.: 16BT70119 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February – 2021

BRIDGE ENGINEERING
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

(Use of codes IRC:6-2014, IRC:21-2000, IS 456:2000, IRC:83-(Part-I)-1999, IRC:83-(Part-II)-1987 and Pigeaud's curves are permitted in the examination hall)

UNIT-I

1.	a)	Briefly explain the loading standards used for the highway bridges. Compare the same with the railway bridge loading standards.	CO1	7 Marks
	b)	Explain the various components of the culvert along with the design procedure.	CO1	7 Marks

(OR)

2.	a)	Explain the basic forms of a bridge structure.	CO2	7 Marks
	b)	How the foundation and pier of the bridge affect the economy and cost of the construction? Explain briefly with example.	CO2	7 Marks

UNIT-II

3.		A reinforced concrete box culvert is required for a national highway crossing. The clear vent way of the box culvert is 4m x 4m. Design the box culvert assuming a super imposed dead load of 12kN/m^2 and a live load of 50kN/m^2.The density of the soil is 16kN/m. Use M 25 grade of concrete and Fe415 steel.	CO33	14 Marks

(OR)

4.		A road bridge deck consists of a reinforced concrete slab continuous over tee beams spaced at 2m centers and cross girders spaced at 5m centers. Thickness of wearing coat = 100mm. Type of loading is IRC class AA. Using M20 grade concrete and Fe415 grade HYSD bars. Design the using given data and draw the cross section of the deck slab over two spans showing reinforcement details.	CO3	14 Marks

UNIT-III

5.		Design a R.C.C. Tee beam and slab deck to suit the following data. Effective span of girders = 16m, width of kerbs = 600mm, clear width of roadway = 7.5m, thickness of wearing coat = 80mm, No.of main girders = 4, spacing of main girders = 2.5m, Spacing of cross girders = 4m, Type of loading = IRC class 70R tracked vehicle – materials, M20 grade concrete and Fe415 grade HYSD bars. Design the deck slab and draw the details of reinforcement.	CO5	14 Marks

(OR)

6.		Design the interior slab panel of a T–beam bridge for the following data: • Clear width of roadway = 7.5m • Span C/C of bearings = 12m • Live load = IRC class AA tracked vehicle • Average thickness of wearing coat = 75mm • Use M 25 mix and Fe415 grades.	CO5	14 Marks

UNIT-IV

7.	a)	Write the different types of bearings used in the bridge.	CO1	4 Marks
	b)	What is the purpose to provide the bearings in the bridge?	CO1	4 Marks
	c)	Compare the steel rock and roller bearing with elastometric bearing along with the application.	CO2	6 Marks

(OR)

8.	a)	Write the general features of bearings used in the bridge.	CO1	7 Marks
	b)	Explain design principles of steel rocker bearing.	CO1	7 Marks

UNIT-V

9.	a)	Explain the various types loads and forces to be considered in the design of piers.	CO2	7 Marks
	b)	Explain general features of a bed block.	CO2	7 Marks

(OR)

10.	a)	What are the materials used for piers and abatements mention them?	CO1	5 Marks
	b)	Explain briefly for the following forces acting on the abutments with their design steps: i) Force due to breaking. ii) Active earth pressure. iii) Horizontal force due to temperature and shrinkage.	CO2	9 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February – 2021

GROUND IMPROVEMENT TECHNIQUES

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the impact at ground surface method of densifying granular soils.	CO1	7 Marks
	b)	Explain the field procedure for compaction of soils.	CO2	7 Marks
		(OR)		
2.	a)	Explain the construction methods used for the construction of stabilized roads.	CO1	7 Marks
	b)	Differentiate between consolidation and compaction of soils and give examples.	CO4	7 Marks

UNIT-II

3.	a)	Explain the design steps for a dewatering system.	CO3	7 Marks
	b)	Explain the electro osmotic method of dewatering for ground improvement.	CO1	7 Marks
		(OR)		
4.	a)	Explain in detail the vacuum well point system of dewatering.	CO1	7 Marks
	b)	Write a short note on following: i) Preloading techniques. ii) Knitted.	CO1	7 Marks

UNIT-III

5.	a)	What is a stone column? What are the methods of installing a stone column?	CO1	7 Marks
	b)	Explain how the engineering properties of soil are changed by the process of bituminous stabilization.	CO5	7 Marks
		(OR)		
6.	a)	Describe the vibroflotation technique of densifying granular soil.	CO6	7 Marks
	b)	What are the types of vertical drains? Explain.	CO1	7 Marks

UNIT-IV

7.	a)	Explain in detail the mechanical soil stabilization.	CO1	7 Marks
	b)	Explain the principle and application of soil-lime stabilization.	CO5	7 Marks
		(OR)		
8.	a)	Explain in detail the different stages of grouting with the help of a neat sketch.	CO1	7 Marks
	b)	Define grouting. What are the objectives of grouting in various Civil engineering applications?	CO4	7 Marks

UNIT-V

9.	a)	What are the design principles of reinforced earth wall?	CO1	7 Marks
	b)	Explain different functions of geo-textiles with neat sketches.	CO6	7 Marks
		(OR)		
10.	a)	Explain in detail the use of geo-synthetics as a reinforcement in various Civil engineering applications.	CO5	7 Marks
	b)	Why geo-synthesis used in roadways on soft sub grades are more beneficial? Explain	CO7	7 Marks

CODE No.: 16BT70201 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

POWER SYSTEM OPERATION AND CONTROL
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Derive the condition for economical load dispatch among various generating plants by considering transmission losses.	CO2	7 Marks
	b)	Explain the importance of load forecasting and explain any one method of load forecasting.	CO1	7 Marks
		(OR)		
2.	a)	Derive transmission line loss equation in terms of B-Coefficients.	CO2	7 Marks
	b)	Incremental fuel costs in Rs/MWh for a plant consisting of two units are $\frac{df_1}{dpg_1} = 0.2pg_1 + 40 \qquad \frac{df_2}{dpg_2} = 0.25pg_2 + 30$ Assume both units are operating at all times and total load varies from 40MW to 250MW and maximum and minimum loads are to be 125 and 20MW respectively. How will the loads be shared between the two units as the system load varies in steps of 50MW over full range? What are the corresponding values of the plant incremental costs?	CO6	7 Marks

UNIT-II

3.	a)	Derive the coordination equation for the optimal scheduling of hydrothermal interconnected power plants.	CO4	7 Marks
	b)	Explain short term hydro scheduling by $\gamma - \lambda$ iteration method.	CO5	7 Marks
		(OR)		
4.		Describe the hydro-thermal economic load scheduling. Derive the necessary equations.	CO4	14 Marks

UNIT-III

5.	a)	Develop the mathematical model for the forward Dynamic programming algorithm, taking into account the start up costs of the units	CO2	8 Marks
	b)	Draw the flowchart for the Priority list method of unit commitment.	CO2	6 Marks
		(OR)		
6.	a)	Explain the procedure for solving Unit commitment problem using Priority list scheme based on simple shutdown algorithm.	CO1	8 Marks
	b)	Explain the various constraints in unit commitment problem.	CO1	6 Marks

UNIT-IV

7.	a)	Draw the block representation of a complete DC excitation system and explain its features.	CO1	7 Marks
	b)	Explain the block diagram representation of IEEE Type-1 excitation system.	CO5	7 Marks
		(OR)		

8.	a)	Derive the transfer function of Generator – load model of power system	CO2	7 Marks
	b)	Explain the block diagram of LFC system.	CO1	7 Marks

UNIT-V

9.	a)	Derive dynamic response of a load frequency control of an isolated power system.	CO2	7 Marks
	b)	Draw a block diagram, with illustrative transfer function of a single area frequency control system. Explain the function of different components of such a control system.	CO1	7 Marks

(OR)

10.	a)	Derive the expression for the change in tie-line power when the loads change in the control areas.	CO4	7 Marks
	b)	Two areas are connected with a tie line .The characteristics are as follows. Area 1 : R=0.015 , D=0.8 , base MVA =500 Area 2 : R=0.01 pu ,D=1 pu , base MVA =500 A load change of 100 MW occurs in area 1 .What is the new frequency and tie-line flow change .The nominal frequency is 50 Hz.	CO6	7 Marks

CODE No.: 16BT70202 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

SWITCHGEAR AND PROTECTION
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Elucidate the operation of Electromagnetic Induction disc type relay with relevant diagrams. Also derive the torque equation.	CO2	14 Marks

(OR)

2.	a)	Elucidate the advantages of static relays over electromagnetic relays.	CO1	7 Marks
	b)	Draw the block diagram of Microprocessor based over current relay and explain.	CO2	7 Marks

UNIT-II

3.	a)	Elucidate the operation of HRC fuse with diagram.	CO5	7 Marks
	b)	Elaborate on the application of Air, Oil, Vacuum, SF6 circuit breakers.	CO5	7 Marks

(OR)

4.	a)	Elaborate arc interruption theories.	CO1	10 Marks
	b)	Analyze current chopping.	CO1	4 Marks

UNIT-III

5.		Elaborate carrier current protection scheme for transmission line protection.	CO2	14 Marks

(OR)

6.		Design a differential protection scheme for star-delta transformer.	CO5	14 Marks

UNIT-IV

7.		Elucidate the causes of over voltages in power system.	CO1	14 Marks

(OR)

8.		Compare time graded and current graded protection schemes for feeders.	CO4	14 Marks

UNIT-V

9.		Analyze the use of Peterson coil with Phasor diagram for grounding.	CO3	14 Marks

(OR)

10.	a)	Elucidate grounding practice with diagram.	CO6	7 Marks
	b)	Discuss the advantages and disadvantages of ungrounded neutral systems.	CO6	7 Marks

CODE No.: 16BT70203 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February – 2021

ENERGY CONSERVATION AND MANAGEMENT

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Differentiate energy index and cost index.	CO1	7 Marks
	b)	Explain the different type of energy audits and procedures.	CO1	7 Marks
		(OR)		
2.	a)	Estimate energy saving potential in the following utilities. i) Educational institute. ii) Hostel building.	CO3	8 Marks
	b)	Explain the principles of energy management and various stages of energy management program.	CO2	6 Marks

UNIT-II

3.		Explain the role of renewable energy resources in present Indian energy scenario to meet the growing demand. Explain few existing conservation opportunities.	CO4	14 Marks
		(OR)		
4.	a)	Describe why designated consumers has energy management cell and explain its benefits.	CO2	7 Marks
	b)	Explain the role of Energy Managers in Industries.	CO1	7 Marks

UNIT-III

5.	a)	Explain the various factors effecting the efficiency and performance of the industrial motors.	CO5	7 Marks
	b)	List out the energy conservation opportunities for industrial lighting system.	CO2	7 Marks
		(OR)		
6.	a)	Is Variable Frequency Drives (VFDs) really conserve energy? Justify with a suitable case study.	CO5	7 Marks
	b)	Explain the role of timers, occupancy sensors and LED lamps in energy conservation in the lighting system.	CO5	7 Marks

UNIT-IV

7.	a)	Explain the function of data loggers and their importance in audit process.	CO2	6 Marks
	b)	Explain the general characteristics of capital investments.	CO5	8 Marks
		(OR)		
8.	a)	Briefly explain the tax considerations on capital investment on energy management.	CO2	5 Marks
	b)	Explain the following time value of money concepts with mathematical formulations. i) Simple interest calculation. ii) Compound interest calculation. iii) Single sum cash flows.	CO1	9 Marks

UNIT-V

9.	a)	What are the implementation issues of demand side management?	CO2	7 Marks
	b)	Explain how load management will reduce energy bill.	CO2	7 Marks
		(OR)		
10.	a)	List out different practical approaches of demand side management.	CO4	6 Marks
	b)	Elaborate the terms peak clipping and peak shifting with respect to energy	CO3	8 Marks

management.

CODE No.: 16BT70204 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February – 2021

FLEXIBLE AC TRANSMISSION SYSTEMS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	What is the need of transmission interconnection for a given power system?	CO1	7 Marks
	b)	Describe the power flow control in an AC transmission system with necessary diagrams.	CO1	7 Marks
		(OR)		
2.	a)	Identify the importance of controllable parameters in transmission systems.	CO5	7 Marks
	b)	What are FACT controllers and explain different categories of FACT controllers.	CO2	7 Marks
		UNIT-II		
3.	a)	Discuss different types reactive compensation equipment for electrical power transmission system.	CO2	7 Marks
	b)	Discuss about the effect of load compensation on transmission system.	CO2	7 Marks
		(OR)		
4.	a)	Differentiate compensated and uncompensated transmission lines.	CO2	7 Marks
	b)	Discuss the effect of series compensation on power transfer capacity of transmission line.	CO2	7 Marks
		UNIT-III		
5.	a)	Propose a system for transmission line to increase the power transfer capacity.	CO3	7 Marks
	b)	Describe the basic operation of Thyristor Switched Capacitor with necessary waveforms and characteristics.	CO2	7 Marks
		(OR)		
6.	a)	Design a block diagram for general control of Static VAR Compensator (SVC).	CO3	7 Marks
	b)	What is a STATCOM? Discuss its construction and working.	CO1	7 Marks
		UNIT-IV		
7.	a)	Discuss the principle of operation of TSSC.	CO2	7 Marks
	b)	Draw and discuss the V-I operating characteristics in voltage control mode and reactance control mode of TCSC.	CO2	7 Marks
		(OR)		
8.	a)	Illustrate the operation of SSSC with relevant diagrams.	CO1	7 Marks
	b)	How power oscillations damping is obtained using series compensation.	CO4	7 Marks
		UNIT-V		
9.	a)	How power flow control is achieved by phase angle regulators?	CO4	7 Marks
	b)	Discuss the operation of TCVR with a circuit diagram.	CO2	7 Marks
		(OR)		
10.	a)	Answer the transmission control capabilities of UPFC.	CO5	7 Marks
	b)	Propose a system to control power flow between Transmission lines and discuss the operating principle of it.	CO3	7 Marks

CODE No.: 16BT70205 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February – 2021

POWER SYSTEM AUTOMATION

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What is power system control? Explain its role and responsibility in power system operation.	CO1	5 Marks
	b)	Describe different modes of operation of power systems.	CO1	9 Marks
		(OR)		
2.	a)	Describe the function of supervisory control systems in power system operator process interaction.	CO2	7 Marks
	b)	Explain the power system operator activities in detail.	CO1	7 Marks

UNIT-II

3.	a)	Draw and explain the flow chart which represents the use of SCADA in power systems.	CO3	7 Marks
	b)	Describe various application functions of transmission SCADA.	CO4	7 Marks
		(OR)		
4.	a)	Draw and explain the block diagram representation of a small master station.	CO3	7 Marks
	b)	Describe the concept of multiple master–multiple remote configuration.	CO4	7 Marks

UNIT-III

5.	a)	Explain the layout of conventional substation and its wiring requirements.	CO1	7 Marks
	b)	Describe the integrated protection functions via hard wiring and LAN with their neat diagrams.	CO5	7 Marks
		(OR)		
6.	a)	What is intelligent bus failover? Explain the intelligent bus failover demonstration.	CO5	7 Marks
	b)	Explain the equipment condition monitoring devices in detail.	CO2	7 Marks

UNIT-IV

7.	a)	Describe the data concepts in a customer information system.	CO5	8 Marks
	b)	Explain how the data will be exchanged between GIS and DMS.	CO5	6 Marks
		(OR)		
8.	a)	Explain the overview of the DMS application functions and demonstrates the interdependence of the functions.	CO5	7 Marks
	b)	Explain the DMS coordination with OMS.	CO5	7 Marks

UNIT-V

9.	a)	Describe the operational planning activities of ISO in pool based market.	CO2	8 Marks
	b)	Explain various advantages of deregulated power systems over vertically integrated power systems.	CO1	6 Marks
		(OR)		
10.	a)	Describe the types of restructuring models in detail.	CO2	6 Marks
	b)	Discuss about power exchange and market operations in detail.	CO1	8 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations February - 2021

ANALYSIS OF POWER ELECTRONIC CONVERTER

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Elaborate the switching characteristics of GTOs with the help of cross sectional view and necessary circuit diagram.	CO7	8 Marks
	b)	List out the various advanced power semiconductor devices with steady state characteristics.	CO5	6 Marks
		(OR)		
2.	a)	Compare the different types of thyristors with switching characteristics.	CO1	6 Marks
	b)	Discuss the constructional features and applications of COOLMOS device with cross sectional view.	CO2	8 Marks

UNIT-II

3.	a)	With the help of neat schematic diagram, explain the gate drive circuit of Power BJT.	CO1	7 Marks
	b)	Discuss the significance of pulse-transformer and opto-coupler in power electronic converters.	CO1	7 Marks
		(OR)		
4.	a)	Explain thyristor converter gating circuit using isolation transformer with relevant diagram.	CO2	7 Marks
	b)	Brief about various gate drive ICs for MOSFET and IGBT.	CO2	7 Marks

UNIT-III

5.		Analyze the operation of 12-pulse fully controlled bridge converter with circuit diagram and trace the output load voltage with highly inductive load.	CO6, CO8	14 Marks
		(OR)		
6.	a)	Explain the operation of 3-pulse semi-controlled bridge converter with circuit diagram.	CO6	6 Marks
	b)	A three-phase full-wave converter is operated from a three-phase Y-connected 208-V, 60-Hz supply and the load resistance is R = 10Ω. If it is required to obtain an average output voltage of 50% of the maximum possible output voltage, calculate (i) the delay angle α, (ii) the r.m.s and average output currents, (iii) the TUF and (iv) the input PF.	CO8	8 Marks

UNIT-IV

7.	a)	Explain buck regulator modes of operation with neat circuit diagram and relevant waveforms.	CO2	6 Marks
	b)	Design a buck regulator has an input voltage of V_s = 12V. The required average output voltage is V_a = 5V at R = 500Ω and the peak-to-peak output ripple voltage is 20mV. The switching frequency is 25kHz. If the peak-to-peak ripple current of inductor is limited to 0.8A, determine (i) the duty cycle k, (ii) the filter inductance L, (iii) the filter capacitor C, and (iv) the critical values of L and C.	CO4	8 Marks

(OR)

8.		Design a suitable converter for Cuk Converter operation. Explain its modes of operation with neat circuit diagram and relevant waveforms. Also deduce the condition for continuous inductor current and capacitor voltage.	CO2, CO4	14 Marks

UNIT-V

9.	a)	Discuss about Selective Harmonic Elimination PWM technique.	CO6	7 Marks
	b)	Compare various advanced PWM techniques.	CO3	7 Marks

(OR)

10.	a)	Describe the process of phase displacement control with neat waveforms.	CO8	7 Marks
	b)	Explain third harmonics injection modulation techniques employed in inverter.	CO3	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

POWER QUALITY

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss the responsibilities of suppliers and end users of electrical power.	CO1	7 Marks
	b)	Explain the use of setting standards to power quality. Name any Five power quality standers.	CO1	7 Marks

(OR)

2.	a)	Define power quality. With neat sketches, explain the different types of power quality problems.	CO1	8 Marks
	b)	Discuss in detail about the Computer Business Equipment Manufacturer's Association (CBEMA). Explain about the events described in the curve.	CO1	6 Marks

UNIT-II

3.		Discuss the following electrical power quality terms: i) i) Notching. ii) ii) Inter-Harmonics. iii) iii) Voltage fluctuations. iv) iv) Waveform distortion. v) v) Short-duration variation.	CO2	14 Marks

(OR)

4.	a)	Define waveform distortion. Explain the wave form distortion categories.	CO2	7 Marks
	b)	List out general mitigation methods for number of faults and fault clearing time can be reduced.	CO1	7 Marks

UNIT-III

5.		In presence of harmonics, how the power system quantities are change?	CO1	14 Marks

(OR)

6.		Explain the effect of harmonic distortion. i) impact on capacitors. ii) impact on transformers. iii) impact on motor. iv) impact on telecommunications. v) impact on energy and demand metering.	CO2	14 Marks

UNIT-IV

7.	a)	Illustrate how the locations will be choosing for power quality monitoring.	CO4	7 Marks
	b)	Elucidate the historical perspective of power quality measuring instruments in power system.	CO5	7 Marks

(OR)

8.	a)	Identify the suitable power quality monitoring and measuring device to measure flicker and explain with functional blocks.	CO4	8 Marks
	b)	Tell the importance of power quality monitoring standards in power system and list them.	CO1	6 Marks

UNIT-V

9.	Elucidate in detail about the distributed generation and its impacts on the network.	CO6	14 Marks

(OR)

10.	Discuss about following of distributed generation. i) Islanding issues. ii) Distribution line compensation. iii) Heavy load and light load connection. iv) Real generation. v) Protection issues.	CO5	14 Marks

CODE No.: 16BT70209 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

SMART GRID TECHNOLOGY
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss the need of modernization of electric grid	CO1	4 Marks
	b)	Give comparison between existing grid and smart grid	CO1	4 Marks
	c)	Discuss the advantages and disadvantages of smart grid	CO1	6 Marks
		(OR)		
2.	a)	Elaborate the smart grid features with respect to technical and nontechnical challenges.	CO1	7 Marks
	b)	Explain in detail the concept of Resilient and Self healing of a grid.	CO3	7 Marks

UNIT-II

3.	a)	Describe the distribution system tools and Remote terminal unit architecture with neat legible sketch.	CO1	7 Marks
	b)	Point out the features and applications of a DMS.	CO1	7 Marks
		(OR)		
4.	a)	Describe the role of wide-area monitoring system in smart grids.	CO1	7 Marks
	b)	Explain the benefits and functions of Energy Management System.	CO3	7 Marks

UNIT-III

5.	a)	Differentiate the advanced metering and traditional electro-mechanical meters	CO1	7 Marks
	b)	Discriminate the key components of smart metering.	CO4	7 Marks
		(OR)		
6.	a)	Elaborate how the reliability of the smart grid can be enhanced by integrating intelligence electronic units (IED)'s in to it.	CO1	7 Marks
	b)	Discriminate how automatic meter reading can make the system smarter.	CO4	7 Marks

UNIT-IV

7.	a)	Describe power quality issues of grid connected renewable energy sources.	CO1	7 Marks
	b)	Discuss about the concept of Power Quality and EMC in smart grids.	CO4	7 Marks
		(OR)		
8.	a)	Illustrate the Power Quality Audit system in smart grids.	CO4	7 Marks
	b)	Explain the need of software and hard ware requirements of a "Web based power quality monitoring".	CO1	7 Marks

UNIT-V

9.	a)	Distinguish between Wired and Wireless Communication.	CO2	7 Marks
	b)	Write short notes on Wide Area Networks and Home Area Networks for smart grid applications.	CO2	7 Marks
		(OR)		
10.	a)	Deliberate the Internet Protocols for smart grid applications.	CO1, CO5	7 Marks
	b)	Discuss about the need of cloud computing and its properties.	CO4	7 Marks

CODE No.: 16BT70210 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February – 2021

SOFT COMPUTING TECHNIQUES

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Differentiate Supervised learning and Unsupervised leaning.	CO1	7 Marks
	b)	Illustrate different Activation Functions in Neural Network.	CO1	7 Marks
		OR)		
2.	a)	Describe the concept of Hebb learning algorithm and explain with a flow chart.	CO1	7 Marks
	b)	Solve the AND function using McCulloch Pitts Neural Model.	CO1	7 Marks

UNIT-II

3.	a)	Demonstrate the Learning Factors of Back Propagation Network.	CO2	8 Marks
	b)	Find the weights using Perceptron Network for ANDNOT function when all the inputs are presented only one time. Use bipolar inputs and targets.	CO2	6 Marks
		(OR)		
4.	a)	Describe the concept of Bidirectional Associative Memory.	CO2	7 Marks
	b)	Illustrate the architecture of Discrete Hopfield Network and explain the process with a suitable algorithm.	CO2	7 Marks

UNIT-III

5.	a)	Define Classical Sets and explain the operations of Crispset.	CO3	7 Marks
	b)	Differentiate Crisp set and Fuzzy set.	CO3	7 Marks
		(OR)		
6.		Summarize the following: i) Membership Function. ii) Rank Ordering.	CO3	14 Marks

UNIT-IV

7.	a)	Analyze the concept of Lambda Cuts for fuzzy sets and fuzzy relations.	CO4	6 Marks
	b)	Two fuzzy relations are given as: Obtain the fuzzy relation $(T)\tilde{}$ using. i) Max-min composition. ii) Max-product composition. $\tilde{R} = \begin{bmatrix} 0.6 & 0.3 & 0.5 \\ 0.2 & 0.9 & 0.6 \end{bmatrix}$ $\tilde{S} = \begin{bmatrix} 0.9 & 0.5 \\ 0.4 & 0.1 \end{bmatrix}$	CO4	8 Marks
		(OR)		
8.		Demonstrate the following: i) Speed Control of DC Motor. ii) Selection of Membership Functions.	CO4	14 Marks

UNIT-V

9.	a)	Draw and explain the model of Chromosome, Genotype and Reproduction.	CO5	7 Marks
	b)	Describe in briefly the Pseducode for Genetic algorithm.	CO5	7 Marks
		(OR)		
10.	a)	Differentiate Value Encoding and Permutation Encoding in GA.	CO5	7 Marks
	b)	Explain in briefly different crossover operations and explain each operation.	CO5	7 Marks

CODE No.: 16BT70301 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

AUTOMOBILE ENGINEERING
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.		Elucidate the working of four-wheel drive arrangement in automobiles with a neat sketch.	CO1	14 Marks
		(OR)		
2.	a)	Explain briefly the function and arrangement of lubricating oil filters.	CO2	7 Marks
	b)	Explain the factors that limit the extent of supercharging of S.I and C.I engines.	CO2	7 Marks
		UNIT-II		
3.		List out the functions of ignition system and explain the working of battery ignition system with a neat diagram.	CO1	14 Marks
		(OR)		
4.		Name different methods of engine cooling. Explain air-cooling method in detail.	CO3	14 Marks
		UNIT-III		
5.		Explain about the engine emission control by three-way catalytic converter system in detail.	CO4	14 Marks
		(OR)		
6.		Enumerate various techniques of pollution control in CI engines. In what way it follows national standards? What benefit it has on the environment?	CO6	14 Marks
		UNIT-IV		
7.		Sketch and explain Davis steering mechanism.	CO4	14 Marks
		(OR)		
8.	a)	Explain the necessity of clutches in automobile. Suggest some design changes in clutch system to improve transmission efficiency.	CO3	7 Marks
	b)	Illustrate the working of universal joints used in automobiles with a neat diagram.	CO1	7 Marks
		UNIT-V		
9.		Differentiate independent suspension system and rigid axle suspension system with suitable example.	CO5	14 Marks
		(OR)		
10.		Classify various brakes used in automobiles. Discuss the working of hydraulic brake with a neat sketch.	CO1	14 Marks

CODE No.: 16BT70302 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

FINITE ELEMENT METHOD
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss the engineering applications of finite element method.	CO1	4 Marks
	b)	Derive stress strain relations for plane stress condition.	CO1	10 Marks

(OR)

2.		Consider the bar shown in Fig.1, an axial load P = 200 x 103 N is applied as shown. Calculate the nodal displacements.	CO1	14 Marks

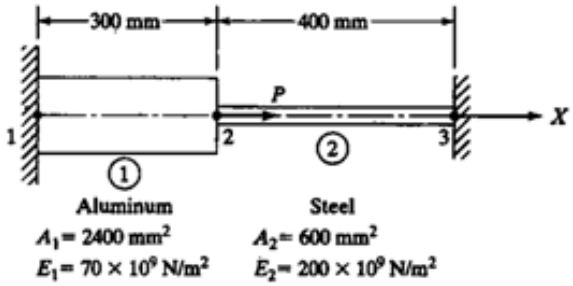


Fig.1

UNIT-II

3.	a)	Write load vector for 2 noded beam elements.	CO2	2 Marks
	b)	Determine the deflection at the point of load application using one element model shown in Fig.2 .	CO2	12 Marks

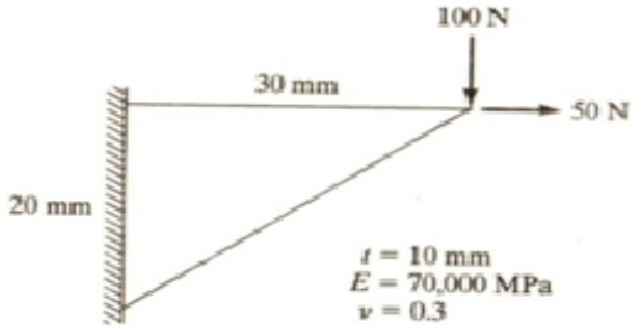


Fig.2 .

(OR)

4.		Derive element stiffness matrix for 2 noded beam elements.	CO2	14 Marks

UNIT-III

5. a) Derive strain displacement B matrix for CST element. CO3 10 Marks

   b) Determine the Jacobian for the (x, y) – (ξ, η) transformation for the element shown in Fig.3. CO3 4 Marks

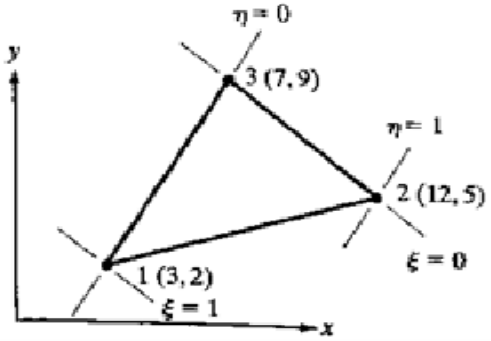


Fig.3

(OR)

6. An axisymmetric body with a linearly distributed load on the conical surface is shown in Fig.4. Determine the equivalent point loads at nodes 2, 4 and 6. CO3 14 Marks

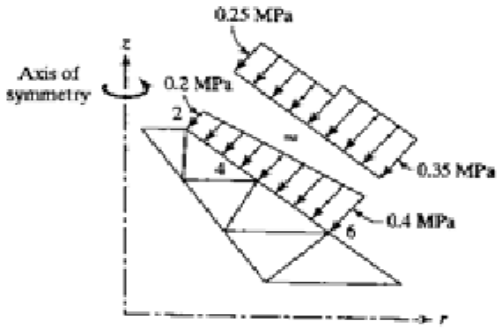


Fig.4

UNIT-IV

7. a) Write short notes on sub parametric, super parametric and iso parametric elements. CO4 7 Marks

   b) Differentiate between h- refinement and p- refinement. CO4 7 Marks

(OR)

8. A composite wall consists of 4cm thick wood, 10cm glass fiber insulation and 1cm thick plaster. If the temperature on wood and plaster faces are 20^0C and -20^0C respectively, determine the temperature distribution in the wall. Assume the thermal conductivity of wood, glass fibre and plaster are 0.17, 0.035 and 0.5W/m K respectively and colder side heat transfer coefficient is 25W/m^2K. CO4 14 Marks

UNIT-V

9.		Determine the Eigen values and Eigen vectors for the stepped bar shown in Fig.5.	CO5	14 Marks

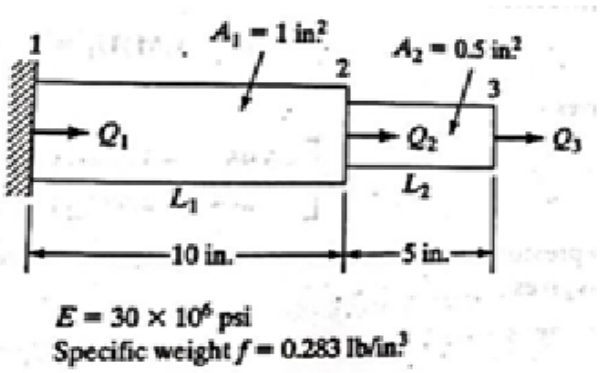


Fig.5.

(OR)

10.	a)	Derive element mass matrix for 1-D bar element.	CO5	6 Marks
	b)	Derive element mass matrix for truss element.	CO5	8 Marks

❀ ❀ ❀

CODE No.: 16BT70303 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

OPERATIONS RESEARCH
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. Solve following problem through graphically CO1 14 Marks

Max $Z= 3X_1+5X_2$

Subject to $X_1+2X_2 \leq 2000$

$X_1-X_2 \leq 1500$

$X_2 \leq 600$, $X_1, X_2 \geq 0$

(OR)

2. Solve following problem through BIG-M method CO2 14 Marks

Min $Z= X_1+X_2$

Subject to $2X_1+X_2 \geq 4$

$X_1+7X_2 \geq 7$

$X_1, X_2 \geq 0$

UNIT-II

3. A manufacturer has distribution centers at X, Y and Z. These centers have availability 40, 20 and 40 units of his product. His retail outlet at A, B, C, D and E requires 25, 10, 20, 30 and 15 units respectively. The transport cost (in rupees) per unit between each center outlet is given below. Determine the optimal distribution to minimize the cost of Transportation. CO4 14 Marks

Distribution Center	Retail Outlets				
	A	B	C	D	E
X	55	30	40	50	50
Y	35	30	100	45	60
Z	40	60	95	35	30

(OR)

4. Company has 4 jobs to be done. The following matrix shows the return in rupees on assigning machines to jobs. Assign 4 jobs to 4 machines so as to maximize the total expected profit. CO3 14 Marks

		Machines			
		A	B	C	D
Jobs	1	32	35	40	28
	2	40	25	30	22
	3	42	27	34	30
	4	25	39	41	35

UNIT-III

5. Find solution to the game whose payoff matrix for player A is given below. CO6 14 Marks

	Player-B		
Player-A	-3	-2	6
	2	0	2
	5	-2	-4

(OR)

6. Solve the following game whose payoff matrix for player-A is given below and find the solution to the game. CO6 14 Marks

	Player-B	
Player-A	1	3
	4	2

UNIT-IV

7. Draw the PERT network for the activities whose three time estimates are given in the table. From the three time estimates obtain the expected times of all the activities and find Critical path, Project duration, Slack for all events, Probability of completing the project in 20 days. CO5 14 Marks

Activity	Optimistic time (days)	Most likely time (days)	Pessimistic time (days)
1 – 2	1	2	3
1 – 3	5	6	7
1 – 4	3	5	7
2 – 5	5	7	9
3 – 5	2	4	6
5 – 6	4	5	6
4 – 7	4	6	8
6 – 7	2	3	4

(OR)

8. The activities involved in Alpha Garment Manufacturing Company are listed with their time estimate as in the following table. Draw the network diagram for the given activities and find the Critical path, Total Float and Free Float. CO5 14 Marks

Activity	Precedence	Duration
A	-	10
B	-	7
C	A	5
D	C	3
E	D	2
F	B,E	1
G	F	14

UNIT-V

9. The demand per day for a belt used in an engine of automobile has the following probability distribution. Simulate the demand for 20 days and find average demand per day for next 20 days. Use random numbers 42, 62, 25, 34, 23, 7, 93, 44, 12, 26, 93, 1, 17, 49, 58, 98, 61, 41, 13, 73. CO5 14 Marks

Demand/Day	Probability
3	0.1
4	0.3
5	0.3
6	0.2
7	0.1

(OR)

10. At a certain petrol pump customer arrive in Poisson process with an average time of 5min between arrivals. The service time of petrol pump follows exponential distribution and as such mean time taken to service is 2min. On the basis of this information, find what is average queue length and what would be the average number of customers in the system. How long on an average a customer weight in the queue? How long on an average a customer thus spend in the system? What is the probability that the customer enter into the system gets service without waiting? CO3 14 Marks

CODE No.: 16BT70304 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February – 2021

CRYOGENICS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Discuss methods to produce low temperatures.	CO1	14 Marks
		(OR)		
2.		How a cascade system can be used to produce liquid Nitrogen? Discuss.	CO2	14 Marks

UNIT-II

3.	a)	Outline thermal properties of material at cryogenic temperatures.	CO1	7 Marks
	b)	Explain super fluidity with the help of neat diagrams.	CO3	7 Marks
		(OR)		
4.		Explain the working of cryogenic refrigeration system with its schematic and T-S diagrams.	CO2	14 Marks

UNIT-III

5.	a)	Explain the working of liquification system for inert gases.	CO2	7 Marks
	b)	Derive the minimum work required for liquification.	CO3	7 Marks
		(OR)		
6.		Illustrate the working of a system used for the production of dry-ice. "The production of dry-ice is more difficult in hot summer compared with winter" – Discuss in detail.	CO4	14 Marks

UNIT-IV

7.	a)	Write briefly on production of low temperatures.	CO1	7 Marks
	b)	Explain with proper reasoning and graph, the effect of low temperature on two mechanical and two thermal properties of engineering materials.	CO4	7 Marks
		(OR)		
8.		Explain applications of low temperature in detail.	CO5	14 Marks

UNIT-V

9.	a)	Explain about Dewar vessels.	CO5	7 Marks
	b)	Discuss the hazards in cryogenic engineering.	CO5	7 Marks
		(OR)		
10.		Why insulations are required for Cryogenic systems? Explain the various types of insulations used. Explain about multi-layer insulation with their applications.	CO5	14 Marks

CODE No.: 16BT70306 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations February - 2021

QUALITY MANAGEMENT AND RELIABILITY ENGINEERING

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the sequential steps and stages involved in ISO 9000 certification for Indian Firms.	CO1	7 Marks
	b)	What is meant by cost of quality? Explain the components of cost of quality.	CO1	7 Marks

(OR)

2.	a)	Explain the Salient features of implementing POKA – YOKE.	CO6	7 Marks
	b)	Explain the secrets and steps towards establishing a successful Quality Circle (QC) program in a Firm.	CO1	7 Marks

UNIT-II

3.	a)	Define control chart and state the objectives of Mean and Range charts.	CO5	7 Marks
	b)	What is meant by process capability? How will you determine the same?	CO5	7 Marks

(OR)

4.		The cloth of the ABC manufacturer was inspected 100 square meters is taken as unit. The following defects per unit were recorded.	CO5	14 Marks

	Unit						
100 sq. m cloth length	1	2	3	4	5	6	7
No. of defects in each unit	0	3	2	1	4	5	3

State:

i) Whether data obtained during inspection is within control?
ii) What type of action is warranted by the management?

UNIT-III

5.	a)	Write the advantages and disadvantages of sampling plans.	CO2	7 Marks
	b)	Draw neat sketch of OC curve and explain its various parameters.	CO2	7 Marks

(OR)

6.	a)	Explain the effect of sample size and acceptance number on OC curve.	CO2	4 Marks
	b)	A shipment of 2,000 portable battery units for microcomputers is about to be inspected by a Malaysian importer. The Korean manufacturer and the importer have set up a sampling plan in which the risk is limited to 5% at an Acceptable Quality Level (AQL) of 2% defective and the risk is set to 10% at Lot Tolerance Percent Defective (LTPD) = 7% defective. To construct the OC curve for the plan of n = 120 sample size and an acceptance level of $c \leq 3$ defectives. Both firms want to know if this plan will satisfy their quality and risk requirements.	CO2	10 Marks

UNIT-IV

7.	a)	Elaborate various configurations of system reliability.	CO4	7 Marks
	b)	Explain the various types of Failure – Hazard models.	CO3	7 Marks

(OR)

8.		A System contains series string of components for which $\Sigma \lambda = 0.005$f/hr. What is the reliability of this system for a mission time of 10 hours? If a similar system is placed in parallel, what is the reliability of the configuration for a 10 hours mission.	CO4	14 Marks

UNIT-V

9.	a)	Explain Active and Standby Redundancies.	CO4	7 Marks
	b)	Explain Fault Tree analysis.	CO4	7 Marks
		(OR)		
10.	a)	Explain the following.	CO4	7 Marks
		i) Maintainability. ii) Availability.		
	b)	Describe the reliability optimization.	CO4	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

INDUSTRIAL ROBOTICS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Sketch and explain the four basic robot configurations classified according to the coordinate system.	CO1	14 Marks
		(OR)		
2.		Explain mechanical grippers and their linkage mechanisms with neat sketches.	CO1	14 Marks

UNIT-II

3.		Explain the various drive system used with an industrial robot and compare their features, merits and demerits.	CO2	14 Marks
		(OR)		
4.		Explain different types of transmission systems used in industrial robots.	CO2	14 Marks

UNIT-III

5.	a)	Discuss about the forward and inverse kinematics in detail.	CO3	7 Marks
	b)	Derive the forward kinematic equations using Denavit-Hartenberg notation for a three-link planner manipulator.	CO3	7 Marks
		(OR)		
6.		Determine the equations of motion for 2-RR planar manipulator using Lagrange-Euler formulation.	CO3	14 Marks

UNIT-IV

7.	a)	Discuss different features of trajectory planning in robots and their significance.	CO4	7 Marks
	b)	Explain skew motion in detail.	CO4	7 Marks
		(OR)		
8.	a)	Briefly explain the working principle of any two types of position sensors with neat sketch.	CO4	7 Marks
	b)	With a block diagram, explain a robotic machine vision system.	CO4	7 Marks

UNIT-V

9.	a)	Write about textual robot language programming as a path in space.	CO5	7 Marks
	b)	Discuss the following categories of program instructions in VAL robot programming: i) Robot configuration control. ii) Motion control.	CO5	7 Marks
		(OR)		
10.	a)	Discuss robot application for assembly and inspection.	CO5	7 Marks
	b)	Describe briefly the operations involved in robotic spot welding. What are the advantages of robotic welding over manual welding?	CO5	7 Marks

CODE No.: 16BT70311 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

PRODUCTION AND OPERATIONS MANAGEMENT

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Discuss briefly Operations Management with block diagram. CO2 7 Marks
   b) Write a brief notes on Historical Development of Operations Management. CO2 7 Marks

(OR)

2. a) Explain in brief the factors affecting productivity. CO3 7 Marks
   b) Give a brief notes on the significances of production systems decisions. CO5 7 Marks

UNIT-II

3. Solve the problem through simple moving average and find mean absolute deviation, mean square error, mean forecast error and mean absolute percentage error for the following problem. CO3 14 Marks

Time (Months)	1	2	3	4	5	6	7	8	9	10	11	12
Demand	94	99	86	122	89	95	74	77	105	103	88	82

(OR)

4. Solve the problem through double moving average and find mean absolute deviation, mean square error, mean forecast error and mean absolute percentage error for the following problem. CO3 14 Marks

Time (Months)	1	2	3	4	5	6	7	8	9	10	11	12
Demand	95	100	87	123	90	96	75	78	106	104	89	83

UNIT-III

5. Estimate the total production cost by using **Hiring and Firing Strategy** with the following details. Inventory holding cost is Rs. 5/unit/month, sub contracting cost is Rs. 10/unit, average pay rate is Rs. 5/hr (40/day), over time pay rate is Rs. 7/hr (above 8 hr/ day), labour hours to produce a unit is 1.6 hr/unit, cost of increasing daily production rate is (hiring and training) is Rs. 300/unit and cost of decreasing daily production rate (layoff) is Rs. 600/unit. CO1 14 Marks

	JAN	FEB	MAR	APR	MAY	JUN
Demand Forecast	900	700	800	1200	1500	1100
Working Days	22	18	21	21	22	20

(OR)

6. Estimate the Total production cost by using **Constant work force strategy** with the following details Inventory holding cost is Rs. 5/unit/month, sub contracting cost is Rs. 10/unit, average pay rate is Rs. 5/hr (40/day), over time pay rate is Rs. 7/hr (above 8 hr/day), labour hours to produce a unit is 1.6 hr/unit, cost of increasing daily production rate is (hiring and training) Rs. 300/unit and cost of decreasing daily production rate (layoff) is Rs. 600/unit CO1 14 Marks

	JAN	FEB	MAR	APR	MAY	JUN
Demand Forecast	900	700	800	1200	1500	1100
Working Days	22	18	21	21	22	20

UNIT-IV

7. Give the difference between MRP and MRP II and Explain MRP-II with block Diagram. CO1 14 Marks

(OR)

8. Enumerate the concepts of Enterprise resource planning, Just-in-Time, Kaizen, Pull method of materials flow and Preventive maintenance. CO1 14 Marks

UNIT-V

9. What is the purpose of Gantt chart and solve the 2-Machine and n-Jobs problem by using Johnson's Algorithm. CO6 14 Marks

Job	1	2	3	4	5	6	7	8
T1	5	2	1	7	6	3	7	5
T2	2	6	2	5	6	7	2	1

(OR)

10. Jobs have to be processed on 5 machines I, II, III, IV, V in the order I→II→III→IV→V. Processing times in minutes are given below. Determine the sequence that will minimize the elapsed time or cycle time. Also find the idle time in each machine. CO6 14 Marks

	Machines					
Jobs		I	II	III	IV	V
	1	11	14	17	10	19
	2	12	14	16	13	17
	3	17	12	11	15	19
	4	16	16	12	12	21
	5	14	16	10	11	19
	6	15	14	13	16	26

CODE No.: 16BT70312 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February – 2021

POWER PLANT ENGINEERING

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		What are the different types of cooling towers? Explain with a neat sketch.	CO1	14 Marks
		(OR)		
2.	a)	Explain different types of dust collectors used in thermal power plant.	CO1	7 Marks
	b)	Enumerate and explain the steps involved in coal handling.	CO1	7 Marks

UNIT-II

3.		List the essential components of a diesel power plant and explain them briefly.	CO2	14 Marks
		(OR)		
4.		Explain the working details of gas turbine power plant with its layout indicating all auxiliaries.	CO2	14 Marks

UNIT-III

5.	a)	What are typical ponds and storage units suitable for installation of hydro-electric power plants? Explain them.	CO3	7 Marks
	b)	What is the importance of spill ways in hydro-electric power projects? Explain their practical applications.	CO2	7 Marks
		(OR)		
6.	a)	Explain the construction and working of the pressurised water reactor nuclear power plant with a layout.	CO2	7 Marks
	b)	Discuss the characteristics of hydrographs with respect to the power generation along with the suitable curves.	CO3	7 Marks

UNIT-IV

7.		Explain the working of magneto hydrodynamics system with a schematic layout.	CO2	14 Marks
		(OR)		
8.	a)	How to make use of solar energy for the generation of power? Discuss the merits and demerits.	CO4	7 Marks
	b)	How to make use of the tides for power generation based on their capacities? Explain the principle of operation.	CO4	7 Marks

UNIT-V

9.		The data for a 2000 kW diesel power plant is as follows: The peak load on the plant = 1500kW, load factor = 0.5, capital cost per kW installed = Rs.15000, annual costs = 15% of capital cost, annual operating costs = Rs.60000, annual maintenance costs = Rs.10000 (fixed) and Rs.20000 (variable), cost of fuel = Rs.0.8 per kg, cost of lubricating oil = Rs.40 per kg, calorific value of fuel = 40000 kJ/kg, consumption of fuel = 0.5kg/kWh, consumption of lubricating oil = 0.0025kg/kWh. Determine the annual energy generated and cost of generation in Rupees per kWh.	CO6	14 Marks
		(OR)		
10.	a)	Briefly explain various methods of reducing thermal pollution.	CO5	7 Marks
	b)	Discuss the pollution due to nuclear power plant.	CO5	7 Marks

❀ ❀ ❀

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

CELLULAR AND MOBILE COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Describe the principle of operation and explain various components of a cellular mobile system with a neat diagram	CO1	7 Marks
	b)	What is hand off and explain its strategies.	CO1	7 Marks
		(OR)		
2.	a)	Design Co-channel interference and derive the relation for Co-channel interference factor in a cell with its K^{th} Co-channel interfering cell.	CO2	7 Marks
	b)	Explain how frequency reuse principle is used in improving the system capacity.	CO1	7 Marks

UNIT-II

3.	a)	Summarize about umbrella pattern effect and list the benefits of umbrella patter **n**.	CO1	7 Marks
	b)	What is diversity receiver? Illustrate how diversity receiver can be used to improve performance of the system even in low transmitted power levels.	CO6	7 Marks
		(OR)		
4.	a)	Classify and describe about various adjacent channel interference mechanisms.	CO1	7 Marks
	b)	Illustrate how cell site location, decrease in power and antenna height effect coverage and interference problems.	CO4	7 Marks

UNIT-III

5.	a)	What are the characteristics of basic antenna structure?	CO3	7 Marks
	b)	Define ground incident angle and ground elevation angle.	CO1	7 Marks
		(OR)		
6.	a)	In a mobile radio environment, if average cell site antenna height is 50m, mobile antenna height is 3m and path length is 5km, find: i) Incident angle. ii) Elevation angle.	CO3	7 Marks
	b)	Explain long distance propagation and point to point prediction model.	CO3	7 Marks

UNIT-IV

7.	a)	Differentiate soft handoff and hard handoff. Explain hard handoffs in CDMA systems	CO5	7 Marks
	b)	Explain non-fixed channel assignment.	CO4	7 Marks
		(OR)		
8.	a)	Analyze how adjacent channel and Co-channel interference can be controlled using underlay overlay arrangement.	CO4	7 Marks
	b)	Outline various methods used to solve the problem of channel assignment to travelling mobile units.	CO4	7 Marks

UNIT-V

9.	a)	Write short notes on: i) Upper layer. ii) W-CDMA.	CO6	7 Marks
	b)	Differentiate three standard 3G systems; also mention the features of 3G standard systems.	CO6	7 Marks

(OR)

10.	a)	Draw GSM architecture and explain.	CO1	7 Marks
	b)	Discuss CDMA-2000 layering structure	CO6	7 Marks

CODE No.: 16BT70402 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

EMBEDDED SYSTEMS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Write a detailed note on functional block diagram of MSP430 microcontroller and explain the various languages used to program the microcontrollers.	CO1	14 Marks
		(OR)		
2.	a)	Explain the memory map of the MSP430 microcontroller.	CO2	7 Marks
	b)	Write a brief note on Interrupts and Resets.	CO2	7 Marks

UNIT-II

3.		Explain the registers in the CPU of MSP430 microcontroller and operation of the stack in the MSP430 microcontroller.	CO5, CO1	14 Marks
		(OR)		
4.	a)	Explain the Register mode and Indirect Register mode with examples.	CO5	7 Marks
	b)	Reproduce the condition code/status register contents of MSP430.	CO5	7 Marks

UNIT-III

5.	a)	Write a program for interfacing LED with MSP430 microcontroller.	CO5	7 Marks
	b)	Explain how to control the Clock Module through the status register.	CO5	7 Marks
		(OR)		
6.	a)	Write a program to copy string from one location in memory to another memory location.	CO3	7 Marks
	b)	Explain how to use the subroutines in embedded programming with an example.	CO3	7 Marks

UNIT-IV

7.	a)	Explain the use of WDT and associated WDTCTL register format.	CO4	7 Marks
	b)	Write a brief note on non-maskable interrupts and the shared data problem.	CO4	7 Marks
		(OR)		
8.	a)	With a neat sketch, explain the architecture of comparator A.	CO5	7 Marks
	b)	Explain the operation of Successive-Approximation ADC.	CO5	7 Marks

UNIT-V

9.	a)	Write a brief note on Finite State Machines.	CO6	7 Marks
	b)	Write a detailed note on IOT communication models.	CO6	7 Marks
		(OR)		
10.	a)	Write a short note on Data path architecture.	CO6	7 Marks
	b)	List the privacy considerations and interoperability issues to be considered while developing IOT devices.	CO6	7 Marks

CODE No.: 16BT70403 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

MICROWAVE ENGINEERING

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss the measurement of scattering parameters of a network	CO1	7 Marks
	b)	A 10mw signal is applied to a 20dB directional coupler. Determine the power available at the coupled port.	CO2	7 Marks
		(OR)		
2.	a)	What is ferrite device? Discuss in detail about circulator with neat diagram.	CO1	7 Marks
	b)	State and find the reciprocal condition in terms of S-parameters for a two port network.?	CO1	7 Marks

UNIT-II

3.	a)	A two cavity Klystron amplifier has the following specifications. Beam voltage V_o= 900V, Beam current I_o= 30mA, frequency f = 8GHz, Gap spacing in either cavity d = 1mm cavity, Spacing between centers of cavities L = 4cm, Effective shunt impedance R_{sh} = 49GΩ. Determine: i) The electron velocity. ii) The dc transit time of electron. iii) The input voltage for maximum output voltage. iv) The voltage gain in decibels.	CO4	7 Marks
	b)	Explain the limitations of conventional tubes.	CO1	7 Marks
		(OR)		
4.	a)	Explain the bunching process of two cavity klystron with neat sketch.	CO2	8 Marks
	b)	Explain velocity modulation in reflex klystron with applegate diagram.	CO2	6 Marks

UNIT-III

5.	a)	Explain the operation of RWH-two valley theory with suitable diagrams.	CO2	6 Marks
	b)	Explain about domain formation in Gunn diode. Explain various oscillating modes of Gunn diode.	CO2	8 Marks
		(OR)		
6.	a)	What are the avalanche transit time devices? Explain the working of TRAPATT diode.	CO2	7 Marks
	b)	In a Gunn diode with active length of 20μm, the drift velocity of electrons is 2×10^7cm. Calculate the rational frequency and critical voltage of the diode.	CO3	7 Marks

UNIT-IV

7.	a)	Calculate the VSWR of a transmission system operating at 20GHz TE_{10} mode is propagating through waveguide of dimension $(6.4 \times 3.2)cm^2$. The distance between two successive minima is 1.6mm.	CO4	7 Marks
	b)	Two identical 30dB directional couplers are used to simple incident and reflected power in a wave guide VSWR=2 and the output of the coupler sampling incident power = 4.5mw.What is the value of reflected power?	CO4	7 Marks
		(OR)		

8.	a)	Describe the functioning of each component in a microwave bench setup.	CO2	6 Marks
	b)	With the help of necessary experimental setup, describe the measurement of unknown load impedance using slotted line.	CO3	8 Marks

UNIT-V

9.	a)	Explain in detail about space wave propagation.	CO1	6 Marks
	b)	The observed critical frequencies of E and F layers at Guwahati at particular times are 2.5MHz and 8.4MHz respectively. Calculate the maximum electron concentrations of the layers.	CO5	8 Marks

(OR)

10.	a)	Explain about effect of the earth's magnetic field on ionosphere radio wave propagation.	CO6	6 Marks
	b)	Define radio horizon and calculate its value. What is the radio horizon of a television antenna placed at a height of 166m? If the signal is to be received at a distance of 66km, what should be the height of receiving antenna?	CO5	8 Marks

CODE No.: 16BT70406 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

SATELLITE COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	With the help of block diagram, demonstrate the operation principle in satellite communication system.	CO1	8 Marks
	b)	Write about satellite frequency band designation and associated applications.	CO1	6 Marks
		(OR)		
2.	a)	Derive the elevation and azimuth angles for geo-stationary satellites with necessary equations.	CO2	8 Marks
	b)	A satellite is in a 322 km high circular orbit. Assuming average radius of earth 6378 km, determine: i) Orbital velocity in meters per second. ii) The orbital period in minutes. iii) The orbital angular velocity in radians per second.	CO4	6 Marks

UNIT-II

3.	a)	Enumerate the steps involved while designing a satellite communication link.	CO3	8 Marks
	b)	Explain with neat sketch. i) Earth station receiver. ii) Earth station transmitter.	CO1	6 Marks
		(OR)		
4.	a)	Derive an expression for the orbital period of circular orbit by considering Newton's Laws of motion and gravitation.	CO2	8 Marks
	b)	The earth rotates once per sidereal day of 23 h 56 min 4.09 secs. Show that the height of Geo-synchronous orbit is about 36,000 kms.	CO4	6 Marks

UNIT-III

5.	a)	Discuss briefly how the demand assignment may be implemented in a TDMA network. What is the advantage of TDMA over FDMA in this respect?	CO5	8 Marks
	b)	Mention in detail about various satellite codes.	CO1	6 Marks
		(OR)		
6.	a)	Discuss the basic types and relationships of satellite antennas.	CO1	7 Marks
	b)	Write a short note on AOCS (Altitude and Orbit Control System) of a satellite.	CO1	7 Marks

UNIT-IV

7.	a)	Analyze and discuss the Delay and Throughput considerations in a satellite system.	CO2	7 Marks
	b)	Summarize the advantages and disadvantages of low and medium earth orbits.	CO1	7 Marks

(OR)

8.	a)	Compare geostationary and geosynchronous satellites.	CO1	7 Marks
	b)	An earth station antenna has a diameter of 30m has an overall efficiency of 68% and is used to receive a signal at 4150MHz. Calculate gain of the antenna.	CO3	7 Marks

UNIT-V

9.	a)	Explain the generation of GPS signals with a neat sketch.	CO5	8 Marks
	b)	Briefly explain about spread spectrum techniques.	CO5	6 Marks

(OR)

10.	a)	Explain are the successful measurements in a GPS C/A code receiver.	CO1	8 Marks
	b)	Write short notes on Satellite Signal Acquisition.	CO1	6 Marks

CODE No.: 16BT70407 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

WIRELESS COMMUNICATION AND NETWORKS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Compare fixed and wireless tele networks.	CO1	7 Marks
	b)	List out and explain SS7 network services.	CO1	7 Marks
		(OR)		
2.	a)	Explain in detail about the frequency division multiple access with neat block diagram.	CO1	7 Marks
	b)	Explain about traffic routing in wireless networks.	CO1	7 Marks

UNIT-II

3.	a)	Define the general terminology used in mobile IP.	CO4	7 Marks
	b)	Explain the protocol stack of WAP.	CO2	7 Marks
		(OR)		
4.	a)	Describe the agent advertisement message with clear format.	CO1	7 Marks
	b)	Explain about wireless session protocol.	CO1	7 Marks

UNIT-III

5.	a)	List out the applications of WLAN.	CO1	7 Marks
	b)	Compare diffused and directed beam infrared LANs.	CO4	7 Marks
		(OR)		
6.	a)	List out the requirements of WLAN and explain each.	CO4	7 Marks
	b)	Explain the architecture and services of IEEE 802.11.	CO1	7 Marks

UNIT-IV

7.	a)	List out the applications of Bluetooth.	CO1	7 Marks
	b)	Explain the protocol architecture of Bluetooth.	CO1	7 Marks
		(OR)		
8.	a)	Explain the concept of Bluetooth usage models.	CO2	7 Marks
	b)	Describe the base band specifications of Bluetooth.	CO2	7 Marks

UNIT-V

9.	a)	Explain the concept of wireless ATM.	CO2	7 Marks
	b)	Explain the general structure of ATM switch.	CO2	7 Marks
		(OR)		
10.	a)	Discuss about CDPD.	CO2	7 Marks
	b)	Explain in detail about physical layer in CDPD.	CO2	7 Marks

CODE No.: 16BT70408 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February – 2021

LOW POWER CMOS VLSI DESIGN

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	State the sources of power dissipation in digital integrated circuits.	CO6	7 Marks
	b)	Explain about technology and device innovations with respect to low power.	CO1	7 Marks

(OR)

2.	a)	Elaborate about static power dissipation in CMOS circuits. Give the alternates to reduce it.	CO3	7 Marks
	b)	How to estimate power dissipation at architecture level?	CO1	7 Marks

UNIT-II

3.		Compute the transition density and static probability of $Y = A + B + C$ given $P(a) = 0.2$, $P(b) = 0.3$, $P(c) = 0.4$, $D(a) = 1$, $D(b) = 2$, $D(c) = 3$.	CO4	14 Marks

(OR)

4.	a)	Give the relation between static probability and conditional probability.	CO3	7 Marks
	b)	Probabilistic power analysis techniques are preferred or not. Justify.	CO2	7 Marks

UNIT-III

5.	a)	How to drive large capacitive loads? Explain in detail.	CO2	7 Marks
	b)	Explain about double edge triggered flip flops.	CO6	7 Marks

(OR)

6.		Whether pre-computation logic can reduce power dissipation or not. Justify.	CO2	14 Marks

UNIT-IV

7.		Explain about low power techniques which can be implemented for SRAM cell.	CO1	14 Marks

(OR)

8.	a)	Elaborate on clock tree distribution.	CO6	7 Marks
	b)	Explain about reduced swing clock.	CO4	7 Marks

UNIT-V

9.	a)	How to reduce power dissipation in digital filters?	CO1	7 Marks
	b)	Explain about parallel processing with voltage reduction.	CO6	7 Marks

(OR)

10.	a)	Where do we use tri-state keeper circuits? Explain.	CO6	7 Marks
	b)	Explain about pulsed word-line and reduced bit-line swing.	CO6	7 Marks

CODE No.: 16BT70409 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February – 2021

RF ENGINEERING

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Describe the behaviour of a resistor over all frequency.	CO3	7 Marks
	b)	What is loss tangent and explain its significance?	CO3	7 Marks
		OR)		
2.	a)	What is the origin of the presence of a capacitor in an inductor?	CO3	7 Marks
	b)	What are the parameters that are to be considered while designing an RF transformer?	CO3	7 Marks
		UNIT-II		
3.	a)	Draw and explain the equivalent circuit of a transmission line.	CO2	7 Marks
	b)	Explain the construction and operation of micro strip line.	CO2	7 Marks
		(OR)		
4.	a)	Derive the expressions for voltages and currents along the length of a transmission line/	CO2	7 Marks
	b)	Define VSWR and explain its significance/	CO2	7 Marks
		UNIT-III		
5.	a)	Explain any of the two discrete component matching methods/	CO3	7 Marks
	b)	Explain the matched network design using micro strip lines/	CO3	7 Marks
		(OR)		
6.	a)	Write the differences between lumped and distributed approaches for filter design.	CO4	7 Marks
	b)	Describe the operation of the diode used for RF applications.	CO3	7 Marks
		UNIT-IV		
7.	a)	Draw and explain the block diagram of generic amplifier system.	CO5	7 Marks
	b)	What is stability and how to find whether the transistor is stable or not?	CO3	7 Marks
		(OR)		
8.	a)	How to design frequency compensated matching network?	CO5	7 Marks
	b)	What is a balanced amplifier and how to design it?	CO5	7 Marks
		UNIT-V		
9.	a)	Draw and explain the principle of operation of negative resistance oscillator.	CO4	7 Marks
	b)	Derive the expression for frequency of oscillations generated by varactor diode oscillator.	CO4	7 Marks
		(OR)		
10.	a)	What are the characteristics of a mixer?	CO5	7 Marks
	b)	What are the advantages of a crystal oscillator?	CO4	7 Marks

CODE No.: 16BT70410 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February – 2021

SPEECH PROCESSING

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Draw the block diagram for a discrete time model of speech production and explain about each block in detail.	CO5	7 Marks
	b)	Describe the terms Diphthongs, Unvoiced and Voiced fricatives and artifacts as applied to the production of speech.	CO1	7 Marks
		(OR)		
2.	a)	Discuss the effect of radiation at the lips.	CO1	6 Marks
	b)	Derive the Transfer function of the lossless tube model.	CO3	8 Marks

UNIT-II

3.	a)	Explain the effect of size and shape of window in analysis of speech.	CO5	8 Marks
	b)	Describe the following time domain parameters. i) Short-time average energy and Magnitude. ii) Short-time average ZCR.	CO1	6 Marks
		(OR)		
4.	a)	Define short-term autocorrelation. What are its applications?	CO6	8 Marks
	b)	Explain how pitch period is estimated using parallel processing approach.	CO5	6 Marks

UNIT-III

5.	a)	Explain the spectrum analysis of voiced speech using a window.	CO4	7 Marks
	b)	Explain the procedure for extracting the impulse response of speech production using Homomorphic system.	CO2	7 Marks
		(OR)		
6.	a)	Discuss the properties of complex cepstrum.	CO1	7 Marks
	b)	Discuss the estimation of formants in a speech signal.	CO2	7 Marks

UNIT-IV

7.	a)	Explain LPC analysis with a mathematical model.	CO5	7 Marks
	b)	Compute LP coefficients using Cholesky decomposition solution for covariance method.	CO3	7 Marks
		(OR)		
8.	a)	Derive the equation for minimum energy using autocorrelation method of LPC coefficient extraction.	CO4	7 Marks
	b)	Explain how vocal tract system is modeled using LP parameters.	CO3	7 Marks

UNIT-V

9.	a)	Discuss the features that distinguish the speakers.	CO4	6 Marks
	b)	Explain the concept of evaluating the similarities of speech patterns in speech recognition.	CO4	8 Marks
		(OR)		
10.	a)	Explain the steps in Viterbi algorithm and its applications.	CO6	8 Marks
	b)	Compare speech recognition and speaker recognition system.	CO4	6 Marks

CODE No.: 16BT70501 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February – 2021

BIG DATA ANALYTICS
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss Four V's of Big Data.	CO1	7 Marks
	b)	Briefly explain Outlier Detection and Treatment.	CO1	7 Marks
		(OR)		
2.	a)	Briefly explain Analytics Process model.	CO1	7 Marks
	b)	Explain different types of Data Sources and Sampling Techniques.	CO1	7 Marks

UNIT-II

3.	a)	What is Hadoop Ecosystem? Discuss various components of Hadoop Ecosystem.	CO2	7 Marks
	b)	Describe the basic building blocks of Hadoop in detail.	CO2	7 Marks
		(OR)		
4.	a)	Briefly explain Hadoop File Systems.	CO2	7 Marks
	b)	Describe HDFS concepts.	CO2	7 Marks

UNIT-III

5.	a)	Explain anatomy of a Map Reduce.	CO3	7 Marks
	b)	Apply the implementation of map reduce concept classic Architecture and explain with an example.	CO4	7 Marks
		(OR)		
6.	a)	Explain Shuffle and Sort.	CO3	7 Marks
	b)	Describe different types of failures in Classic MapReduce.	CO3	7 Marks

UNIT-IV

7.	a)	What do you mean by HiveQL Data Definition Language? Explain any three HIVE QL DDL command with its syntax and example.	CO5	7 Marks
	b)	Compare HIVE with traditional databases.	CO4	7 Marks
		(OR)		
8.	a)	Identify the importance of Data Processing Operators of Pig.	CO2	7 Marks
	b)	Explain Querying Data in HIVE with an Example.	CO4	7 Marks

UNIT-V

9.	a)	Investigate about Nutch Search Engine in detail.	CO6	7 Marks
	b)	Describe about Crunch and Spark.	CO6	7 Marks
		(OR)		
10.	a)	Describe about SEDA.	CO1	7 Marks
	b)	Design Hadoop Data flow architecture at Rackspace.	CO1	7 Marks

CODE No.: 16BT70505 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February – 2021

HUMAN COMPUTER INTERACTION

[Computer Science and Engineering, Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the chronological history of GUI.	CO1	7 Marks
	b)	Explain about the principles of user interface design.	CO1	7 Marks
		(OR)		
2.	a)	What are the important human characteristics which have influence on interface and screen design?	CO2	7 Marks
	b)	Compare and contrast GUI versus Web page design.	CO2	7 Marks

UNIT-II

3.	a)	Explain briefly about the important human characteristics in design of a system.	CO3	7 Marks
	b)	Compare and contrast direct and indirect methods of requirements analysis.	CO2	7 Marks
		(OR)		
4.	a)	Why the system training and documentation are also an internal part of any development effort? Discuss.	CO4	7 Marks
	b)	What is the importance of user's tasks and needs important in design of a system?	CO1	7 Marks

UNIT-III

5.	a)	Explain the guidelines for displaying graphic components on screen.	CO4	7 Marks
	b)	Discuss in detail the technological considerations in interface design.	CO3	7 Marks
		(OR)		
6.	a)	What is the role of screen navigation and flow in good screen design?	CO2	7 Marks
	b)	What is a Screen? What is the purpose of a screen?	CO2	7 Marks

UNIT-IV

7.	a)	What are the guidelines for designing icons?	CO4	7 Marks
	b)	What are the various guidelines for presenting error messages on web?	CO2	7 Marks
		(OR)		
8.	a)	Explain the advantages and disadvantages of image maps, video and animation.	CO2	7 Marks
	b)	Discuss any 5 possible problems with colour.	CO4	7 Marks

UNIT-V

9.	a)	What are menu-selection and dialog box trees? And write it advantages.	CO1	7 Marks
	b)	What is the role of state charts in specification? Give an example of state-chart for file manipulation actions.	CO2	7 Marks
		(OR)		
10.	a)	Explain the importance of Interface – Building Tools.	CO2	7 Marks
	b)	What are the uses of video displays? Explain various video display devices in details.	CO5	7 Marks

CODE No.: 16BT71001 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

ANALYTICAL INSTRUMENTATION
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Describe the working principle of Sodium analyzer with a neat sketch.	CO1	7 Marks
	b)	Explain any one method of conductivity measurement with a neat sketch.	CO1	7 Marks
		(OR)		
2.	a)	Discuss the working principle of direct reading pH meter.	CO1	7 Marks
	b)	Explain the working principle of Dissolved oxygen analyzer with a neat sketch.	CO1	7 Marks

UNIT-II

3.	a)	Explain different detectors used in UV and Visible Spectrophotometers.	CO1	7 Marks
	b)	Compare single beam and double beam spectrometers.	CO2	7 Marks
		(OR)		
4.	a)	Elucidate the working of any one type of IR spectrometer and mention how the chemical solution is analyzed.	CO4	7 Marks
	b)	What is a spectrophotometer? Explain in detail about the construction and working principle of Fourier Transform IR Spectrometer.	CO1	7 Marks

UNIT-III

5.	a)	Specify the significance of flame photometer in analysis of chemical solutions and explain the working of clinical flame photometer.	CO5	7 Marks
	b)	Describe the working principle of atomic absorption spectrometer with relevant application.	CO3	7 Marks
		(OR)		
6.	a)	Explain in detail about Magnetic deflection type Mass spectrometer.	CO1	7 Marks
	b)	What is meant by Nuclear Magnetic Resonance? Explain the construction and working principle of NMR Spectrometer.	CO1	7 Marks

UNIT-IV

7.	a)	Describe how gas chromatography is used to provide valid conclusions by analyzing chemical solutions with an example.	CO3	7 Marks
	b)	Explain argon ionization detector in detail.	CO1	7 Marks
		(OR)		
8.	a)	List the different detectors used in liquid chromatography. Explain any one.	CO1	7 Marks
	b)	Explain the working principle of liquid chromatography with a neat sketch.	CO1	7 Marks

UNIT-V

9.	a)	Write short notes on the Scintillation counter and Proportional counter.	CO1	7 Marks
	b)	Explain the working of X-ray detector.	CO1	7 Marks
		(OR)		
10.	a)	Outline the instrumentation involved in hydrocarbons estimation in pollution monitoring.	CO6	7 Marks
	b)	Explain GM counter with neat construction.	CO1	7 Marks

CODE No.: 16BT71002 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

BIOMEDICAL SIGNAL PROCESSING
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	With the help of a block diagram, explain the objectives of biomedical signal analysis.	CO1	6 Marks
	b)	Explain the following biomedical signals. Draw the waveforms and give the frequency ranges relevant to these signals. (i) ECG (ii) EEG .	CO6	8 Marks
		(OR)		
2.		Sketch the diagram of computer aided diagnosis based upon the biomedical signal analysis.	CO1	14 Marks

UNIT-II

3.	a)	Write a short note on Physiological interference and compare stationary and non-stationary process.	CO2	7 Marks
	b)	Explain about homomorphic filtering.	CO2	7 Marks
		(OR)		
4.		Illustrate how noise is removed with case studies.	CO2	14 Marks

UNIT-III

5.		What are the advantages of adaptive filters over static filter? Design an adaptive filter using LMS algorithm.	CO3	14 Marks
		(OR)		
6.		Explain the significance in phase sensitive detector in biomedical signal processing and explain its operation with neat sketch.	CO3	14 Marks

UNIT-IV

7.		Explain in detail about QRS detection algorithm.	CO5	14 Marks
		(OR)		
8.		Write a short note on: i) Detection of Dicrotic notch. ii) Correlation analysis of EEG channels.	CO4	14 Marks

UNIT-V

9.		Explain the Welch method for power spectral. Density determination.	CO6	14 Marks
		(OR)		
10.		Explain the following terms. i) Direct FFT. ii) Window functions.	CO6	14 Marks

CODE No.: 16BT71003 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February – 2021

INDUSTRIAL AUTOMATION
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Draw the block diagram of power supply unit and explain.	CO1	7 Marks
	b)	Describe the similarities and differences between PLC ladder logic and relay ladder logic.	CO2	7 Marks

(OR)

2.	a)	List out memory types in PLC and explain in detail.	CO1	5 Marks
	b)	Write short notes on: i) Photodiode and bidirectional opto isolators. ii) Basic sequence of operation for a PLC.	CO1	9 Marks

UNIT-II

3.	a)	A fan is to be started and stopped from any one of three locations. Each location has a start and a stop button. Note that normally closed stops should be in series and normally open starts in parallel. Describe the operation using ladder logic.	CO4	8 Marks
	b)	What are the different data transfer and logical operations in a PLC?	CO3	6 Marks

(OR)

4.	a)	Explain the function of relay logic in PLC programming.	CO2	5 Marks
	b)	Explain PLC timer and counter functions with suitable ladder logic example.	CO2	9 Marks

UNIT-III

5.	a)	What is Distributed Control System? What are its merits and demerits? Explain how data bus works in a DCS using block diagram.	CO1	8 Marks
	b)	Discuss the local control unit communication facilities used in any process industry.	CO2	6 Marks

(OR)

6.	a)	Explain the general architecture of DCS.	CO2	6 Marks
	b)	Compare the CSMA/CD, Token ring and Token bus communication protocols in DCS.	CO6	8 Marks

UNIT-IV

7.	a)	How the communication takes place in RTU? Explain in detail.	CO4	6 Marks
	b)	Explain the selection procedure of SCADA system for industrial automation.	CO4	8 Marks

(OR)

8.	a)	Draw the overview of the SCADA system.	CO1	5 Marks
	b)	Explain in detail of Master terminal unit.	CO2	9 Marks

UNIT-V

9.	a)	Briefly explain the concept of HART. Explain different HART commands.	CO6	6 Marks
	b)	What are the basic requirements of field bus standard? Explain in brief about interoperability and interchangeability.	CO5	8 Marks

(OR)

10.	a)	What is HART protocol? Explain its operation with a neat block diagram.	CO6	6 Marks
	b)	Explain the architecture of Intelligent Field bus device. State its advantages and disadvantages.	CO4	8 Marks

CODE No.: 16BT71009 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February – 2021

POWER PLANT INSTRUMENTATION
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the operation of Hydro power generation with the help of layout in detail.	CO1	7 Marks
	b)	Classify different instruments in a power plant.	CO2	7 Marks
		(OR)		
2.	a)	Explain the process of nuclear energy developed in Nuclear reactor.	CO1	7 Marks
	b)	Elaborate the significance of Co-generation.	CO2	7 Marks

UNIT-II

3.	a)	Select a suitable measuring device to measure steam temperature and explain its working principle.	CO3	7 Marks
	b)	Elaborate the operation of differential pressure transmitter with a neat sketch.	CO1	7 Marks
		(OR)		
4.	a)	Illustrate the schematic diagram and explain the operation of Steam flow measurement.	CO4	7 Marks
	b)	Justify how the differential pressure method is used for drum level control.	CO2	7 Marks

UNIT-III

5.	a)	Explain the significance of feed forward plus feedback controller in steam temperature control.	CO4	7 Marks
	b)	Elaborate the operation of Furnace draft control -1 with neat sketch.	CO2	7 Marks
		(OR)		
6.	a)	Illustrate with schematic diagram and explain the operation of cascade steam temperature control.	CO5	7 Marks
	b)	Select a suitable circuit for combustion control mechanism.	CO3	7 Marks

UNIT-IV

7.	a)	Explain the principle parts of steam turbine.	CO3	7 Marks
	b)	Illustrate the different types of parameters for measurement in Turbine system.	CO4	7 Marks
		(OR)		
8.	a)	Explain the significance of lubrication system and its control.	CO4	7 Marks
	b)	Elaborate the operation of Turbo alternator cooling system.	CO3	7 Marks

UNIT-V

9.	a)	Mention the key aspects of maintenance of measuring instruments.	CO6	7 Marks
	b)	Discuss in detail the safety interlocks and start up and shutdown interlocks.	CO1	7 Marks
		(OR)		
10.	a)	Elaborate the term intrinsic safety of instruments.	CO1	7 Marks
	b)	Discuss the various explosion hazards in instrument maintenance.	CO2	7 Marks

CODE No.: 16BT71201 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

BIG DATA TECHNOLOGIES
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Explain about characteristics, advantages and applications of Big data.	CO1	7 Marks
	b)	Explain Apache Hadoop and Hadoop Ecosystem with example.	CO1	7 Marks
		(OR)		
2.	a)	Explain about the processing of a job in hadoop with a neat sketch.	CO2	7 Marks
	b)	List the various operational modes of hadoop cluster configuration and explain in detail about configuring/installing the hadoop in local/ standalone mode.	CO2	7 Marks
		UNIT-II		
3.	a)	Explain the hadoop distributed file system architecture with a neat sketch.	CO2	7 Marks
	b)	How google file system differs from the hadoop file system and explains the google file system architecture with a neat sketch?	CO2	7 Marks
		(OR)		
4.	a)	Distinguish between the old and new versions of hadoop API for Map Reduce frame work.	CO5	7 Marks
	b)	Explain about the implementation of map reduce concept with a small example.	CO5	7 Marks
		UNIT-III		
5.	a)	Explain the role of combiner, record reader and partitioner within a map reduce program model of hadoop.	CO5	7 Marks
	b)	Distinguish between the old and new versions of hadoop API for Map Reduce frame work.	CO5	7 Marks
		(OR)		
6.	a)	Explain the architecture of a pig with a neat sketch.	CO5	6 Marks
	b)	Explain the syntax of a pig program with a suitable example.	CO5	8 Marks
		UNIT-IV		
7.	a)	Explain about the configuration of CLI client and WI client while interacting with HIVE with neat sketch.	CO5	7 Marks
	b)	Explain about the various data types supported by HIVEQL with an example.	CO5	7 Marks
		(OR)		
8.	a)	Explain the operators supported by pig with respect to Data access, transformations and debugging operations.	CO1	7 Marks
	b)	Explain the syntax of a pig program with suitable example.	CO1	7 Marks
		UNIT-V		
9.		Elaborate Zookeeper in production.	CO5	14 Marks
		(OR)		
10.		Explain Pig and Wukong to explore Billion-Edge network graphs.	CO5	14 Marks

CODE No.: 16BT71202 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

MOBILE APPLICATION DEVELOPMENT

[Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Compare and contrast different Mobile Platforms.	CO1	7 Marks
	b)	Explain components of Android Stack with a neat sketch.	CO1	7 Marks
		(OR)		
2.	a)	Describe various design patterns in Mobile Information design.	CO1	7 Marks
	b)	What is Dalvik? Write the steps for creating virtual device.	CO1	7 Marks

UNIT-II

3.	a)	What are different types of intents? Explain in detail.	CO1	7 Marks
	b)	Create an Android Application to listen User Interface Notifications.	CO4	7 Marks
		(OR)		
4.	a)	Write the steps for sending and receiving implicit intents.	CO1	7 Marks
	b)	Develop an Android Application to manage changes to screen orientation.	CO3	7 Marks

UNIT-III

5.		What is difference between View and View group? Explain various View Group elements with suitable example.	CO1	14 Marks
		(OR)		
6.	a)	How to create user interface programmatically? Explain with an example.	CO2	7 Marks
	b)	Create an Android Application to save data to the internal storage.	CO4	7 Marks

UNIT-IV

7.	a)	Create an Android Application to receive SMS.	CO6	7 Marks
	b)	Develop an Android Application for downloading binary data.	CO4	7 Marks
		(OR)		
8.	a)	Create an Android Application to get location data.	CO6	7 Marks
	b)	Develop an Android Application for downloading text data.	CO4	7 Marks

UNIT-V

9.	a)	How to invoke an activity from a service? Explain in detail.	CO5	7 Marks
	b)	Write about Objective-C classes and control structures.	CO1	7 Marks
		(OR)		
10.	a)	Explain the Anatomy of an IOS App.	CO1	7 Marks
	b)	How to debug IOS Apps? Explain in detail.	CO2	7 Marks

CODE No.: 16BT71203 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February – 2021

INFORMATION RETRIEVAL SYSTEMS
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Illustrate in detail about Digital Libraries and Data Warehouse.	CO1	7 Marks
	b)	What are objectives of Information Retrieval System and explain in detail?	CO1	7 Marks
		(OR)		
2.	a)	Differentiate item normalization and text normalization with suitable examples.	CO1	9 Marks
	b)	Define Multimedia and index data base search. How it relates to Information Retrieval System?	CO1	5 Marks

UNIT-II

3.	a)	What is Ingest? Explain with a suitable example.	CO2	6 Marks
	b)	Define Zoning. How to process Tokens in Information Retrieval System?	CO2	8 Marks
		(OR)		
4.		Discuss in Brief : i) Indexing by Term. ii) Indexing by Concept. iii) Multimedia Indexing.	CO3	14 Marks

UNIT-III

5.	a)	Illustrate the concept of similarity measures for a document.	CO3	7 Marks
	b)	Describe in briefly weighted Searches of Boolean Systems in Information Retrieval.	CO3	7 Marks
		(OR)		
6.		Discuss the following: i) Term –Term Matrix. ii) Term Relationship Matrix. iii) Vector Representation. iv) Iterated Class Assignments.	CO3	14 Marks

UNIT-IV

7.		State and explain different ways to display Hit list of items.	CO4	14 Marks
		(OR)		
8.	a)	Illustrate the concept of Hidden Markov Models.	CO4	7 Marks
	b)	Explain Page Ranking algorithms in detail.	CO4	7 Marks

UNIT-V

9.	a)	Differentiate Text Search Optimization and Software Search Optimization.	CO4	5 Marks
	b)	Summarize the following Software Search Optimization algorithms. i) Boyer-Moore algorithm. ii) Aho-Corasick algorithm. iii) Knuth morris-pratt algorithm.	CO5	9 Marks
		(OR)		
10.		What is Information System Evaluation and give overview on Evaluation?	CO5	14 Marks

CODE No.: 16BT71204 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February – 2021

MOBILE COMPUTING
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain in detail about handheld devices.	CO1	7 Marks
	b)	List the limitations of Mobile Computing.	CO1	7 Marks
		(OR)		
2.	a)	With neat sketch, explain GSM Architecture.	CO1	7 Marks
	b)	List out the various properties of LTE communication standards.	CO5	7 Marks

UNIT-II

3.	a)	Describe in detail about near and far terminals.	CO5	7 Marks
	b)	Explain the distinguished features of SDMA and TDMA.	CO5	7 Marks
		(OR)		
4.	a)	Explain in detail about MAC Management.	CO5	7 Marks
	b)	Describe in detail about physical layer and MAC layer in WLAN.	CO5	7 Marks

UNIT-III

5.	a)	Explain IP packet delivery and handover mechanism.	CO4	7 Marks
	b)	Explain routing optimization.	CO4	7 Marks
		(OR)		
6.	a)	Explain TCP over 2.5G/3G wireless network.	CO4	7 Marks
	b)	Explain selection transmission in mobile transport layer.	CO4	7 Marks

UNIT-IV

7.	a)	Define context-aware computing and explain different context types used in context-aware computing.	CO2	7 Marks
	b)	Explain catch invalidation mechanism.	CO2	7 Marks
		(OR)		
8.	a)	Discuss about classification of data delivery mechanisms.	CO2	7 Marks
	b)	Explain selective tuning techniques.	CO2	7 Marks

UNIT-V

9.	a)	List the applications of MANET.	CO3	7 Marks
	b)	What are the security issues in MANETs? Explain.	CO3	7 Marks
		(OR)		
10.	a)	Explain about wireless transaction protocol.	CO3	7 Marks
	b)	Describe about wireless application environment in WAP.	CO3	7 Marks

CODE No.: 16BT71205 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

CRYPTOGRAPHY AND NETWORK SECURITY
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Outline following cryptanalysis attacks. i) Cipher text-only. ii) Known-plaintext. iii) Chosen-plaintext.	CO2	7 Marks
	b)	Illustrate the components of Conventional Encryption Model with neat diagram. Explain each component in detail.	CO2	7 Marks
		(OR)		
2.	a)	Apply Playfair cipher with the Key word "KEYWORD" and encrypt the following plaintext "GOODLUCK".	CO1	7 Marks
	b)	Apply columnar transposition for the plain text "**SREE VIDYANIKETHAN ENGINEERING COLLEGE**" using encryption Key "6 4 3 5 1 7 2".	CO3	7 Marks

UNIT-II

3.	a)	Users A and B use the Diffie-Hellman key exchange technique with a common prime $q = 11$ and a primitive root a =2. i) If user A has public key Y_A=9, what is A's private key X_A? ii) If user B has public key Y_B=3, what is B's private key X_B?	CO3	7 Marks
	b)	List applications of public-key cryptography.	CO1	7 Marks
		(OR)		
4.	a)	Describe in detail the key generation in AES algorithm and its expansion format.	CO1	7 Marks
	b)	With a neat sketch, explain the Elliptic curve cryptography with an example.	CO1	7 Marks

UNIT-III

5.	a)	What is Digital Signature? Explain how it is created at the sender end and retrieved at receiver end differentiate digital signature from digital certificate.	CO4	7 Marks
	b)	Discuss about the objectives of HMAC and its security features.	CO1	7 Marks
		(OR)		
6.	a)	Write down the steps involved in Elgamal Digital Signature Scheme and Schnorr Digital Signature Scheme used for authenticating a person.	CO4	7 Marks
	b)	Illustrate simple Hash functions with necessary examples.	CO3	7 Marks

UNIT-IV

7.	a)	Discuss about Anti-Replay Service in Encapsulating Security Payload.	CO5	7 Marks
	b)	Compare security association database and security policy database.	CO5	7 Marks
		(OR)		
8.	a)	Examine the key rings and its significance in PGP. Show how the message generation from sender to receiver and explain with suitable diagram.	CO5	7 Marks
	b)	Differentiate between transport modes ***vs.*** tunnel mode encryption in IPsec.	CO5	7 Marks

UNIT-V

9.	a)	Discuss the various measures that may be used for intrusion detection.	CO1	7 Marks
	b)	What are viruses? Explain the virus related threats and the counter measures applied.	CO3	7 Marks

(OR)

10.	a)	Discuss how firewalls help in the establishing a security framework for an organization.	CO1	7 Marks
	b)	Explain in detail about the password selection strategies.	CO3	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

SYSTEM MODELING AND SIMULATION

[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What are the steps in simulation study? Explain.	CO1	8 Marks
	b)	List out the advantages and disadvantages of Simulation.	CO1	6 Marks

(OR)

2.	a)	Name the entities, attributes, activities, events and state variables for the system shown below: i) Library. ii) Bank. iii) Airport. iv) Grocery store.	CO1	8 Marks
	b)	Define simulation. List any five circumstances, when the simulation is the appropriate tool and when it is not.	CO1	6 Marks

UNIT-II

3.	a)	Write R code to find the factorial of a number (use recursion).	CO3	7 Marks
	b)	Write R code for calculating the coefficient of correlation using the following data.	CO3	7 Marks

X	10	12	18	24	24	27
Y	13	18	12	25	30	10

(OR)

4.	a)	How to pass default values for arguments in R? Give example.	CO3	7 Marks
	b)	Discuss about ANOVA.	CO3	7 Marks

UNIT-III

5.	a)	Explain any two discrete distributions.	CO1	7 Marks
	b)	What is Poisson process? Mention the properties of Poisson process.	CO2	7 Marks

(OR)

6.		Six dump trucks are used to haul coal from entrance of a small mine to the rail road. Each truck is loaded by one of the two loaders. After loading, truck immediately moves to the scale to be weighed as soon as possible. Both loaders and scale have FCFS for trucks. Travel time from loader to scale is negligible. After being weighed, a truck begins a travel time and then returns to loader queue. Simulate for clock = 20. Find average loader utilization and average scale utilization. The activity times arc given in the following table:	CO4	14 Marks

Loading Time	10	5	5	10	15	10	10
Weighing Time	12	12	12	16	12	16	
Traveling time	60	100	40	40	80		

UNIT-IV

7.	a)	Explain any two long-run measures of performance of queuing systems.	CO2	7 Marks
	b)	Explain about Networks of queues.	CO2	7 Marks

(OR)

8.	a)	Explain inverse-transform technique of producing random variates for exponential distribution.	CO3	3 Marks
	b)	Generate three Poison variates with mean $\alpha = 0.2$.	CO3	4 Marks
	c)	Explain the types of simulation with respect to output analysis with example.	CO3	7 Marks

UNIT-V

9.	a)	Differentiate between terminating or transient simulation and steady state simulation with examples.	CO6	7 Marks
	b)	Briefly explain the measure of performance of a simulation system.	CO6	7 Marks
		(OR)		
10.		Demonstrate an appropriate method for collecting the data from stale data and time varying data.	CO6	14 Marks

CODE No.: 16BT71502 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February – 2021

SYSTEMS ENGINEERING
[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Compare Traditional Engineering and System Engineering disciplines.	CO1	7 Marks
	b)	Briefly explain various system engineering activities and products.	CO1	7 Marks
		(OR)		
2.	a)	Explain what Modularity is with an example and give its characteristics.	CO1	7 Marks
	b)	Briefly explain about origins of systems engineering.	CO1	7 Marks
		UNIT-II		
3.		Discuss about the Model of Complex System.	CO2	14 Marks
		(OR)		
4.		Explain System Life Cycle.	CO2	14 Marks
		UNIT-III		
5.	a)	Explain the process of producing needs and requirement analysis in system engineering.	CO3	7 Marks
	b)	What are system functional specifications?	CO3	7 Marks
		(OR)		
6.	a)	What are the advantages of using the system design team approach for a large development project?	CO3	7 Marks
	b)	What do we need operational requirements analysis.	CO3	7 Marks
		UNIT-IV		
7.	a)	List the characteristics of a set of well stated operational requirements for analyzing their adequacy.	CO4	5 Marks
	b)	Explain functional analysis and formulation.	CO4	9 Marks
		(OR)		
8.	a)	Define the primary systems engineering activities that contribute to products of the needs analysis phase.	CO4	7 Marks
	b)	Explain about concept validation.	CO4	7 Marks
		UNIT-V		
9.		Discuss with examples of different activities in the advanced development phase.	CO5	14 Marks
		(OR)		
10.	a)	Explain the steps for transition from development to production.	CO5	7 Marks
	b)	Discuss In- Service support.	CO5	7 Marks

CODE No.: 16BT71505 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February – 2021

NETWORK PROGRAMMING

[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Explain about elementary TCP sockets.	CO1	7 Marks
	b)	Compare UDP and TCP.	CO2	7 Marks
		(OR)		
2.	a)	Describe about concurrent servers.	CO1	7 Marks
	b)	Explain about listen and accept functions.	CO1	7 Marks
		UNIT-II		
3.	a)	If TCP client doesn't call bind, how will the address be bound to the client socket?	CO3	7 Marks
	b)	Explain signal handling on a POSIX complaint system.	CO1	7 Marks
		(OR)		
4.	a)	Explain about TCP Echo server and Client functions.	CO1	7 Marks
	b)	Explain the need for getsockopt and setsockopt functions.	CO1	7 Marks
		UNIT-III		
5.	a)	Implement recvfrom and sendto functions.	CO4	7 Marks
	b)	Explain about outgoing interface with UDP.	CO1	7 Marks
		(OR)		
6.	a)	Explain about Lost Datagrams in UDP.	CO1	7 Marks
	b)	How does TCP deal with Lost Packet during transmission.	CO1	7 Marks
		UNIT-IV		
7.	a)	Discuss the use of gethostbyAddr function with an example.	CO4	7 Marks
	b)	Discuss about IPV6 Server and IPV4 Client.	CO1	7 Marks
		(OR)		
8.	a)	Explain about Domain Name System.	CO1	7 Marks
	b)	Write about the usage of uname function.	CO5	7 Marks
		UNIT-V		
9.	a)	Explain the scenario of One Server Multiple Clients.	CO1	7 Marks
	b)	Apply message queues for process communication.	CO6	7 Marks
		(OR)		
10.	a)	Explain about Full Duplex Pipes.	CO1	7 Marks
	b)	Write about implementation of rlogin for remote access.	CO1	7 Marks

CODE No.: 16BT71508 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

INTERNET OF THINGS

[Computer Science and Engineering, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Define IOT. Discuss various application areas of IOT.	CO1	14 Marks
		(OR)		
2.		What are the four pillars of IOT? Describe each pillar with the help of suitable example.	CO1	14 Marks

UNIT-II

3.	a)	Explain Arduino. What are the things need to be considered for developing on the Arduino?	CO2	6 Marks
	b)	Why the python is the first choice for the Raspberry Pi language than C or C++?	CO1	8 Marks
		(OR)		
4.		How domain specific IOT systems are developed and managed? Illustrate specific cases.	CO2	14 Marks

UNIT-III

5.	a)	Explain the role of UDP and MAC address in IOT.	CO2	8 Marks
	b)	Describe any three different types of sensors with example.	CO2	6 Marks
		(OR)		
6.		Explain internet communication and list its different kinds of protocols.	CO3	14 Marks

UNIT-IV

7.	a)	Discuss about process specification in IOT.	CO2	7 Marks
	b)	Differentiate domain model specification and information model specification.	CO3	7 Marks
		(OR)		
8.		Illustrate the design of IoT for smart cities environment with automations.	CO3	14 Marks

UNIT-V

9.		Demonstrate in detail about Hadoop Map Reduce architecture for batch data analysis with an example	CO3	14 Marks
		(OR)		
10.	a)	What is Apache Oozie? Explain its work flow in detail.	CO3	7 Marks
	b)	Explain about HDFS architecture with an example.	CO3	7 Marks

CODE No.: 16BT5HS01 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

MANAGEMENT SCIENCE
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Write and explain the functions of management.	CO1	7 Marks
	b)	What is SWOT analysis? Explain.	CO2	7 Marks
		(OR)		
2.	a)	Describe the elements of corporate planning process.	CO1	7 Marks
	b)	Distinguish between matrix organization and network organization.	CO3	7 Marks

UNIT-II

3.	a)	What is plant location? Explain its principles in detail.	CO1	5 Marks
	b)	ABC Ltd. uses EOQ logic to determine the order quantity for its various components and is planning its orders. The Annual consumption is 80,000 units, Cost to place one order is Rs.1,200, Cost per unit is Rs. 50 and carrying cost is 6% of Unit cost. Find EOQ, No. of order per year and Total Cost of Inventory.	CO4	9 Marks
		(OR)		
4.	a)	Describe the control charts for variables with an example.	CO1	7 Marks
	b)	Explain about ABC analysis.	CO4	7 Marks

UNIT-III

5.	a)	Write about the functions of Human Resource Management.	CO1	7 Marks
	b)	Describe the job evaluation with examples.	CO1	7 Marks
		(OR)		
6.	a)	Explain about Maslow's hierarchy of human needs in detail.	CO1	7 Marks
	b)	Describe the Herzberg's two-factor theory of motivation with examples.	CO1	7 Marks

UNIT-IV

7.	a)	Distinguish between Entrepreneur and Manager.	CO5	7 Marks
	b)	Explain about Women as an Entrepreneur.	CO5	7 Marks
		(OR)		

8. An R and D project has a list of tasks to be performed whose time estimates are given in the Table, as follows: CO4 14 Marks

Time estimates for R & D Project

Activity	Activity Name	t_o	t_m (in days)	t_p
1-2	A	4	6	8
1-3	B	2	3	10
1-4	C	6	8	16
2-4	D	1	2	3
3-4	E	6	7	8
3-5	F	6	7	14
4-6	G	3	5	7
4-7	H	4	11	12
5-7	I	2	4	6
6-7	J	2	9	10

i) Draw the project network.

ii) Find the critical path.

iii) Find the probability that the project is completed in 19 days. If the probability is less than 20%, find the probability of completing it in 24 days.

UNIT-V

9. a) Explain about Enterprise resource planning in detail. CO1 7 Marks

b) Write about Value chain analysis with an example. CO4 7 Marks

(OR)

10. a) What is Total Quality Management (TQM)? Explain. CO5 7 Marks

b) Write about maintenance strategies in detail. CO6 7 Marks

CODE No.: 16BT6HS01 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January – 2022

BANKING AND INSURANCE

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

	UNIT-I		
1.	Define banking. Explain its functions.	CO1 CO2	14 Marks
	OR)		
2.	Explain the functions of Reserve Bank of India.	CO1 CO2	14 Marks
	UNIT-II		
3.	Explain various steps in opening and closing of an account.	CO1	14 Marks
	(OR)		
4.	Explain elaborately the concept of anti-money laundering.	CO1 CO2	14 Marks
	UNIT-III		
5.	Discuss about various types of e-payment system.	CO1	14 Marks
	(OR)		
6.	Define e-payment system. Explain various business models.	CO1 CO2	14 Marks
	UNIT-IV		
7.	Discuss briefly the elements of Insurance.	CO1	14 Marks
	(OR)		
8.	Define risk. Distinguish between risk and uncertainty.	CO1 CO2	14 Marks
	UNIT-V		
9.	Distinguish between LIC and GIC insurance contracts.	CO1	14 Marks
	(OR)		
10.	Explain recent product innovation in LIC of India.	CO3 CO4	14 Marks

CODE No.: 16BT6HS02 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January – 2022

BUSINESS COMMUNICATION AND CAREER SKILLS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Define grapevine communication and discuss its advantages and disadvantages.	CO1	14 Marks
		(OR)		
2.	a)	Discuss the important characteristic features of business communication.	CO1	7 Marks
	b)	"Horizontal communication plays a crucial role in an organization."Evaluate.	CO5	7 Marks

UNIT-II

3.		Justify the relevance of cross-cultural communication in the present scenario.	CO5	14 Marks
		(OR)		
4.	a)	"Crisis management is a must for a company." Analyze.	CO2	7 Marks
	b)	Differentiate 'corporate citizenship' and 'social responsibility.'	CO2	7 Marks

UNIT-III

5.		Design a format of a business letter and explain the significance of each component with example.	CO3	14 Marks
		(OR)		
6.	a)	Describe the importance of persuasive messages in the success of a company.	CO1	7 Marks
	b)	Differentiate 'positive messages' and 'negative messages.'	CO2	7 Marks

UNIT-IV

7.		Illustrate the basic patterns of business presentation.	CO4	14 Marks
		(OR)		
8.	a)	"A resume that captures the attention of the potential employer is essential to reach the top position in a corporate sector" Evaluate.	CO5	7 Marks
	b)	Examine the pros and cons of online recruitment process.	CO2	7 Marks

UNIT-V

9.		Describe different types of interview with their aims and objectives.	CO1	14 Marks
		(OR)		
10.	a)	"What you speak in an interview is not as important as how you speak." Justify.	CO5	7 Marks
	b)	Compare On-Campus interview with Off-Campus interview.	CO5	7 Marks

CODE No.: 16BT6HS06 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January – 2022

GERMAN LANGUAGE

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Ergäzen Sie : (ich, Sie, du, er, sie) CO1 7 Marks
   1. Mein Name ist Tina. Wie heißen _____?
   2. Hallo, ich bin Maria. Entschuldigung, wie heißt _____?
   3. Ich heiße Pia. Und wer bist _____?
   4. John kommt aus Frankfurt. _____ wohnt in Zürich.
   5. Das ist Frau Lang. _____ kommt aus Deutschland.
   6. _____ heiße Emma Reiter.
   7. Woher Kommen _____ ? Aus England?

   b) Der Vokal ist falsch. Wie heißt das Wort richtig? CO1 3 Marks
   1. Der Wog _____
   2. Das Lund _____
   3. Das Hatil _____
   4. Das Jihr _____
   5. Die A-Behn _____
   6. Der Boch _____

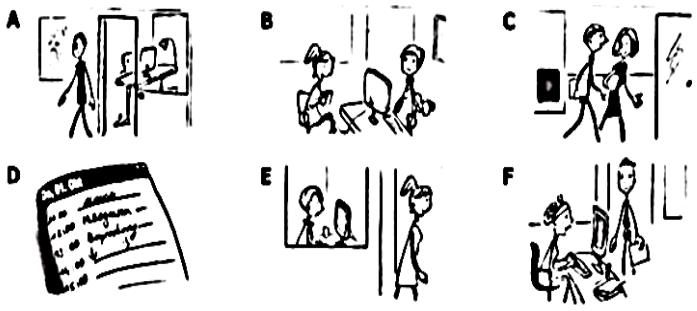
   c) Ergäzen Sie die Zahlen. CO1 4 Marks
   1. Null: _____
   2. Siebzig: _____
   3. Sechszehn:_____
   4. Dreiundfünfzig;_____
   5. 44:_____
   6. 75: _____
   7. 12: _____
   8. 66:_____

OR)

2. a) **Notieren Sie die Sprache(n).** CO1 4 Marks
   1. Portugal:_____
   2. Schweden: _____
   3. Thailand:_____
   4. Kanada : _____

   b) **Welches Bild passt? Ordnen Sie** CO1 6 Marks

a Welches Bild passt? Ordnen Sie zu.



1. ___ Die Besprechung ist nach dem Essen. **4. ___Er kommt mit einer Kollegin.**

2. ___ Er geht zu einer Kollegin. **5. ___ Sie ist bei einer Kollegin.**

3. ___ Er kommt aus dem Büro. **6. ___ Sie kommt von einer Kolleging.**

   c) **Schreiben Sie Sätze:** CO2 4 Marks
   1. Eva / sehr gern / fotografieren/.
   2. Eva / und Nina / gern / reisen/.
   3. Ina / sprechen / gern / Deutsch /.
   4. Boris / nicht gern / lesen/.

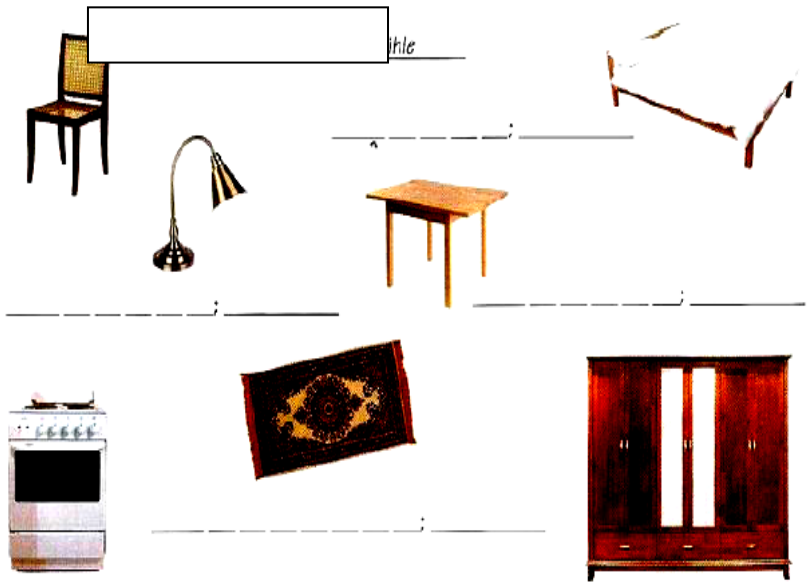
UNIT-II

3. **Ergänzen Sie die Verben.** CO3 14 Marks

a) (fahren) Wohin __1__ Herr Schmitt? – Er____2____ nach München.
b) (arbeiten) Wo ____3___ Herr Schmitt? – Er ___4___ bei Siemens.
c) (machen) Was __5__ Herr Hartmann? (fahren) Er ___6___ nach Haus.
d) (sprechen) Wir____7___ Deutsch. Er ____8____ Englisch.
e) (sprechen) Was __9_____ du? – Ich ____10____ Deutsch.
f) (fahren) Wir __11___ nach Italien. ___12____ du auch nach Italien?
g) (lesen) ___13_____ du?- Nein, ich ___14____ nicht.

(OR)

4. a) **Wie heißen die Sachen? Notieren Sie die Wörter mit Artikel.** CO2 7 Marks



b) **Wie viel ist das?** CO2 7 Marks

1. Neun+ Zehn + drei = ...
2. sechsundzwanzig– fünf + vier =.....
3. Sechzehn + elf – fuenf =.....
4. Neunundzwanzig + achtundachtzig =.....
5. Siebzehn + vierunfuenzig + zwanzig = ...
6. Sechsundzwanzig + Siebzehn- neun= .....
7. fünfzehn + achtundneunzig- eins = ...

UNIT-III

5. a) **Was ist richtig? Schreiben Sie**. CO3 7 Marks

1. Ich *reist / reise* gern.
2. Tom *kocht / kochen* nicht gern.
3. Nina *singst / singt* sehr gern.
4. Wir *lesen / lese* nicht gern.
5. Tom und Markus *spielen / spielt* gern.
6. Und du? *Liest / Lest* du gern?
7. *Tanzen / Tanzt* Sie gern, Frau Weber?

b) **Welches Wort passt nicht? Streichen Sie durch.** CO3 4 Marks

1. die Stunde	der Tag	der Mensch	die Woche
2. die Beruf	die Freizeit	die Journalistin	das Buch
3. das Kino	das Theater	der Frühling	das Museum
4. der Arzt	das Techniker	die Journalistin	das Buch

c) **Was müssen/können/wollen Sie machen? Beantworten Sie die Fragen.** CO3 3 Marks

1. Was müssen Sie am Wochenede machen?
2. Was Können Sie im Urlaub machen?
3. Was wollen Sie heute Aben machen?

(OR)

6. **Notieren Sie die Pluralformen.** CO2 14 Marks

Ärzte, Ärzinnen, Berfue, Bücher, Cafes, Frauen, Hobbys, Kinos, Miarbeiter, Nächte, Studentinnen, Taxifahrer, Techniker, Wörter

Singular	**Plural**	**Singular**	**Plural**
1. der Techniker	_____	8. die Frau	_____
2. der Taxifahrer	_____	9. die Studentin	_____
3. der Mitarbeiter	_____	10.die Ärztin	_____
4. der Beruf	_____	11. das Wort	_____
5. der Arzt	_____	12. das Buch	_____
6. die Nacht	_____	13. das Cafe	_____
7. das Hobby	_____	14. das Kino	_____

UNIT-IV

7. **Lessen Sie den Wochenkalender von Lea. Beantworten Sie die Fragen.** CO3 14 Marks

	Vormittag	Nachmittag	Abend
Montag	8:00–13:00 Uni	16:30–17:15 Saxophon	18:00–22:00 Taxi fahren
Dienstag	10:30–12:00 Uni	14:00–18:30 Uni	
Mittwoch	8:00–10:00 schwimmen	14:00–18:30 Uni	20:00 Kino
Donnerstag	8:00–12:00 Uni	14:00–18:30 Uni	
Freitag	8:00–13:00 Uni	14:00–18:00 Taxi fahren	21:00 tanzen
Samstag		15:00 Familienfeier von Tom ☺	
Sonntag	schlafen ☺☺		

1. Wann spielt Lea Saxophon?
2. Wann ist Lea in der Uni?
3. Wann fährt Lea Taxi?
4. Wann Schwimmt sie?
5. Wann geht sie ins Kino?
6. Wann tanzt sie?
7. Wann ist die Familienfeier?

(OR)

8. a) **Wie heißt das Gegenteil? Notieren Sie das passende Wort**. CO4 4 Marks
   1. Das zimmer ist nicht klein, es ist .....
   2. Im Garten ist es nicht leise, es ist .....
   3. Die Küche ist nicht dunkel, sie ist .....
   4. Das Haus liegt nicht weit weg, es liegt .....

   b) **Schreiben Sie die Fragen zu den Antworten.** CO1 3 Marks
   1. _____? * Fabio. Und du?
   2. _____? * Aus Rom.
   3. _____? * In Frankfurt.

   c) **Fragen und Antworten. Ordnen Sie zu.** CO4 7 Marks

1.	____Wie heißen Sie?	A	Aus Irland. Und Sie?
2.	____Wo wohnst du?	B	Englisch und Deutsch
3.	____Woher kommen Sie?	C	Emilia
4.	____Welche Sprachen sprechen Sie?	D	Mein Name ist Kunze.
5.	____ Wer bist du?	E	Aus Brasilien. Und du?
6.	____ Wo wohnen Sie?	F	In Stuttgart. Und Sie?
7.	____ Woher kommst du?	G	In Berlin. Und du?

UNIT-V

9. a) **Lessen Sie. Whoher kommen die Personen? Wo wohnen sie? Welche Sprachen sprechen sie?** CO6 12 Marks

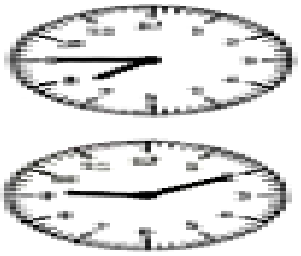
Rose Lewis kommt aus den USA. Sie wohnt in San Francisco. Sie spricht Englisch und Deutsch. Sie lernt Spanisch.

Boris Walder kommt aus Österreich. Er wohnt in Salzburg. Er spricht Deutsch und Englisch. Er lernt Arabisch.

Kateb Brahim kommt aus Algerien. Er wohnt in Genf. Er spricht Arabisch, Französisch und lernt Deutsch.

Hong Yang kommt aus China. Sie wohnt in Shanghai. Frau Hong spricht Chinesisch und Deutsch.

b) Wie Spät ist es? CO4 2 Marks



_____

_____

(OR)

10. a) **Wie heißen diese Berufe? Notieren Sie unter dem Bild. Ergänzen Sie in Ihrer Sprache.** CO5 7 Marks

der Hausmeister , die Juristin, die Lehrerin, der Elektriker, der Programmier

b) Lessen Sie. Schreiben Sie die Daten ins Formular. CO5 7 Marks

Tobias Gruber ist am 7. Dezember 1980 in Deutschland geboren. Er wohnt schon 3 Jahre in Wien. Er ist Programmierer und arbeitet in einem Krankenhaus. Er reist gern, und er geht auch gern ins Kino.

Vorname	Nachname
Geburtsdatum	Wohnort
Beruf	Hobbys

CODE No.: 16BT6HS11 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January – 2022

PERSONALITY DEVELOPMENT

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		"There is not one right personality. It differs by role". Explain.	CO1	14 Marks
		(OR)		
2.	a)	Explain the personality attribute in taking a bold decision.	CO2	7 Marks
	b)	What are the important traits a person should have for developing good interpersonal skills?	CO2	7 Marks

UNIT-II

3.		Attitude is a very critical personal attribute. Describe with illustrations.	CO3	14 Marks
		(OR)		
4.	a)	Taking up responsibility is strength. Illustrate.	CO2	7 Marks
	b)	Integrity and values are important for career growth. Explain.	CO2	7 Marks

UNIT-III

5.		Explain 80**:**20 rules with examples.	CO5	14 Marks
		(OR)		
6.	a)	Stress is required in life. Explain.	CO1	7 Marks
	b)	Self-management is essential for success. Give examples.	CO1	7 Marks

UNIT-IV

7.		"Leadership is the key to 99 percent of all successful efforts"-Erskine Bowles. Describe.	CO4	14 Marks
		(OR)		
8.	a)	Barriers in communicating with team. Explain with examples.	CO3	7 Marks
	b)	Important aspects to remember while communicating with superiors and other members.	CO3	7 Marks

UNIT-V

9.		Four main things to learn in the first week of the job. Explain.	CO5	14 Marks
		(OR)		
10.	a)	What is career planning? Why is it important?	CO4	7 Marks
	b)	Identifying work values will help your career growth. Illustrate.	CO4	7 Marks

CODE No.: 16BT51203 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

WEB TECHNOLOGIES
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Write an HTML document to provide a form that collects names and telephone number.	CO1	7 Marks
	b)	Explain in detail about client-side Storage.	CO1	7 Marks
		(OR)		
2.	a)	Write the HTML code to generate a login web page with fields user id, password and a submit button. Consider the following while writing the HTML code.	CO2	7 Marks
	b)	Name different types of offline web applications. Distinguish between HTML and HTML5.	CO2	7 Marks

UNIT-II

3.	a)	What are the benefits of using styles compared with placing formatting directly into the text of the web page?	CO2	7 Marks
	b)	Write a HTML code with Java script. Which will show an alert message “Hello” whenever user clicks a button?	CO1	7 Marks
		(OR)		
4.	a)	Explain about various java script functions and events.	CO3	7 Marks
	b)	Discuss about CSS Selectors and features of CSS3.	CO5	7 Marks

UNIT-III

5.	a)	Classify JQuery selectors and Explain in detail.	CO5	7 Marks
	b)	How to create responsive layouts using bootstrap CSS? Explain.	CO5	7 Marks
		(OR)		
6.	a)	Develop a login web page using the grid system in bootstrap.	CO7	6 Marks
	b)	Explain about responsive classes with suitable examples.	CO7	8 Marks

UNIT-IV

7.	a)	Describe the Integration of PHP and AJAX with an example.	CO5	7 Marks
	b)	Discuss different types of control structures in PHP.	CO5	7 Marks
		(OR)		
8.	a)	Discuss about Object Oriented PHP.	CO4	7 Marks
	b)	Explain the predefined and user defined functions in PHP with an example.	CO5	7 Marks

UNIT-V

9.	a)	Write a PHP script to retrieve the data from oracle database.	CO6	7 Marks
	b)	What are cookies? How can you create, access and delete a cookie in PHP with the help of an example?	CO4	7 Marks
		(OR)		
10.	a)	How the result set of Mysql is handled in PHP?	CO6	7 Marks
	b)	Discuss various authentication methodologies used in PHP.	CO4	7 Marks

CODE No.: 16BT51501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

COMPILER DESIGN
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain in detail about lexical analyzer generator LEX.	CO5	7 Marks
	b)	What is a compiler? Explain the structure of a compiler, showing the output of each phase using a simple expression.	CO1	7 Marks
		(OR)		
2.	a)	What is meant by input buffering? Explain the use of sentinels in recognizing tokens.	CO1	7 Marks
	b)	Compare compiler and interpreter with suitable diagrams.	CO1	7 Marks

UNIT-II

3.	a)	Construct SLR parser for the following grammar. $E \rightarrow E + T / T$ $T \rightarrow TF / F$ $F \rightarrow F^* / a / b$	CO3	10 Marks
	b)	Differentiate between Top down and Bottom up Parsing methods.	CO3	4 Marks
		(OR)		
4.	a)	What is recursive descent parsing? Write recursive descent parser for the following grammar after doing necessary transformations. $E \rightarrow E + T / T$ $T \rightarrow T * F / F$ $F \rightarrow (E) / id$	CO3	10 Marks
	b)	Why LR parsers are attractive?	CO1	4 Marks

UNIT-III

5.	a)	Explain about the type expressions and the type equivalences in detail.	CO4	7 Marks
	b)	Differentiate between Synthesized and Inherited attributes with suitable examples	CO4	7 Marks
		(OR)		
6.	a)	What is an Abstract syntax tree? How to construct it? Explain by writing syntax directed definition.	CO4	7 Marks
	b)	Define Type Checker. Write down the specification of a simple Type Checker.	CO4	7 Marks

UNIT-IV

7.	a)	Explain with an example, how to generate the intermediate code for the flow of control statements (for and while statements)	CO5	7 Marks
	b)	Compare three different storage allocation strategies.	CO6	7 Marks
		(OR)		
8.	a)	Translate the expression -(a+b)*(c+d)+(a+b+c) into quadruple, triple and indirect triple.	CO4	7 Marks
	b)	Explain with an example, how to generate the intermediate code for if-statements and go to statements.	CO3	7 Marks

UNIT-V

9.	a)	What are the principle sources of optimization? Give the classification of code optimization.	CO2	7 Marks
	b)	Explain with an example optimization of Basic blocks.	CO2	7 Marks
		(OR)		
10.	a)	Explain the functional issues to be considered while generating the object code.	CO3	7 Marks
	b)	Write the algorithm for simple code generator. And show with an example how instruction scheduling can affect the efficiency of generated code.	CO3	7 Marks

CODE No.: 16BT60114 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January – 2022

DISASTER MITIGATION AND MANAGEMENT

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Write an account on the impact of disasters on life and environment.	CO2	7 Marks
	b)	Explain how the public awareness is helpful in risk reduction.	CO1	7 Marks
		OR)		
2.	a)	Explain about Hazard Assessment.	CO2	7 Marks
	b)	Explain about basic principles and elements of disaster mitigation.	CO4	7 Marks

UNIT-II

3.	a)	Give adverse effects of tsunami. Also discuss the tsunami mitigation measures.	CO2	7 Marks
	b)	Distinguish between active control and passive control systems. Draw the block diagram of both the systems.	CO6	7 Marks
		(OR)		
4.	a)	Discuss the consequences of natural disasters in Urban areas in view of earth quakes.	CO6	7 Marks
	b)	Consider a worst affected Earthquake hazard and what government role in its remedial measures was.	CO5	7 Marks

UNIT-III

5.	a)	Explain the necessary steps to be taken to avoid dangerous epidemics after a flood disaster.	CO2	7 Marks
	b)	Write a short note on the drought control measures adopted across the globe.	CO8	7 Marks
		(OR)		
6.	a)	Discuss the consequences of natural disasters in Urban areas in view of : i) cyclones. ii) floods.	CO4	7 Marks
	b)	Explain the disaster flood with the help of a case study.	CO7	7 Marks

UNIT-IV

7.	a)	Explain briefly different causes for landslides.	CO2	7 Marks
	b)	Discuss the types of landslides.	CO4	7 Marks
		(OR)		
8.	a)	Discuss the consequences of the natural disaster landslide.	CO2	7 Marks
	b)	Discuss the various methods of preventing landslides.	CO2	7 Marks

UNIT-V

9.	a)	Explain cost-benefit analysis with respect to various disaster management programs.	CO3	7 Marks
	b)	Discuss about a few emerging trends in disaster management.	CO4	7 Marks
		(OR)		
10.	a)	Discuss the role of knowledge based expert system in disaster Management.	CO3	7 Marks
	b)	Discuss the various functions of disaster mitigation organization.	CO4	7 Marks

CODE No.: 16BT60115 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January – 2022

ENVIRONMENTAL POLLUTION AND CONTROL

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss briefly about impacts of noise pollution.	CO1	7 Marks
	b)	Classify the impacts of noise pollution on humans.	CO1	7 Marks
		(OR)		
2.	a)	What are the various causes of Air pollution?	CO1	7 Marks
	b)	Analyze the behavior of plumes under different lapse rate.	CO1	7 Marks

UNIT-II

3.	a)	Write an account of causes and control methods of air pollutants.	CO2	7 Marks
	b)	Discuss in detail about harmful effects of air pollutants on materials.	CO2	7 Marks
		(OR)		
4.	a)	Explain the working principle of Electrostatic Precipitator with a neat sketch. What are its advantages and disadvantages?	CO2	7 Marks
	b)	With neat sketch, explain working principle of cyclones.	CO2	7 Marks

UNIT-III

5.	a)	What are the causes, sources and effects of water pollution?	CO3	7 Marks
	b)	Differentiate between surface and ground water quality.	CO3	7 Marks
		(OR)		
6.	a)	Write the drinking water quality standards as per IS10500**:**2012.	CO3	7 Marks
	b)	Write short notes on aeration of water.	CO3	7 Marks

UNIT-IV

7.		List out and explain the effects of soil pollutants which are considered as important.	CO4	14 Marks
		(OR)		
8.	a)	What are the measures to be taken to prevent soil pollution?	CO4	7 Marks
	b)	Differentiate between organic and synthetic fertilizer.	CO4	7 Marks

UNIT-V

9.	a)	What are the different methods of solid waste disposal? Explain the method of Composting.	CO5	7 Marks
	b)	Write a detailed note on solid waste management.	CO5	7 Marks
		(OR)		
10.		List out the various types of solid wastes generated in your locality. Select and explain suitable techniques to control solid wastes.	CO5	14 Marks

CODE No.: 16BT60118 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January – 2022

RURAL TECHNOLOGY

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Explain role of technology in improving rural infrastructure.	CO1	14 Marks
		(OR)		
2.		Explain role of NABARD and CSIR in rural development.	CO1	14 Marks

UNIT-II

3.	a)	Fossil fuels will not support rising human needs on a long term anymore because of their faster consumption rates. What is the immediate action to be initiated to meet our energy needs? Suggest any two options in Indian context and their advantages.	CO2	7 Marks
	b)	Rural India is rich in biomass. Elaborate on the judicious use of the available biomass to meet the agricultural and energy needs of the villages.	CO4	7 Marks
		(OR)		
4.	a)	What is meant by 3 'R's? Explain the advantages of 3 R principle	CO1	7 Marks
	b)	Write in detail about any three types of alternative sources of energy.	CO2	7 Marks

UNIT-III

5.	a)	Explain how tissue culture is employed in vegetative propagation of nursery plants. State the role of nurseries in agro-forestry activities.	CO2	7 Marks
	b)	Write notes on any two agro-based technologies that contribute to economic development of the villages.	CO6	7 Marks
		(OR)		
6.		Discuss foods and agro based technologies which will give employment and profits to community.	CO4	14 Marks

UNIT-IV

7.	a)	What are Biofertilizers? Why are they superior to chemical fertilizers? Although organic farming is an age-old practice, why is it becoming difficult now to adopt the same? Give 2 reasons.	CO6	7 Marks
	b)	Central and State governments have contributed significantly to rural health by allocating funds for toilet construction to every household. Do you think 100% ODF (Open Defecation Free) has been achieved? If not, give any two reasons. Suggest two measures to achieve the target	CO4	7 Marks
		(OR)		
8.	a)	Explain water purification methods in context of rural suitability and sustainability.	CO5	7 Marks
	b)	Write a detailed note on rain water harvesting.	CO4	7 Marks

UNIT-V

9.		State the role of private sector in provision of employment and education in rural areas.	CO3	14 Marks
		(OR)		
10.		"Information technology" - Role and impact in development in rural areas, analyze clearly.	CO5	14 Marks

CODE No.: 16BT60501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

SOFTWARE TESTING

[Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Find out some myths related to software testing and explain them in detail.	CO1	7 Marks
	b)	Differentiate between effective and exhaustive software testing.	CO2	7 Marks
		(OR)		
2.	a)	What are the factors for determining the limit of testing?	CO1	7 Marks
	b)	"Testing should be performed with a mindset of finding bugs. This suspicious strategy (destructive approach) helps in finding more and more bugs". Justify?	CO2	7 Marks
		UNIT-II		
3.	a)	Explain Loop Testing in detail.	CO1	7 Marks
	b)	What is Basis Path Testing? With an example, specify the Steps to Calculate the independent paths.	CO3	7 Marks
		(OR)		
4.	a)	List and explain the elements of State Testing.	CO1	7 Marks
	b)	Write a program to check if a number is prime. Find its basic blocks and compute defs, C-uses and p-uses and draw the def-use graph.	CO4	7 Marks
		UNIT-III		
5.	a)	Describe the need of state table? Explain the procedure for converting state table to a test case.	CO3	7 Marks
	b)	Give Boundary value analysis with an example.	CO2	7 Marks
		(OR)		
6.	a)	Explain the techniques followed for decision table testing with an example.	CO1	7 Marks
	b)	Demonstrate the cause-effect graphing based testing.	CO3	7 Marks
		UNIT-IV		
7.	a)	Explain the process of computing the functional points of a real time project.	CO2	7 Marks
	b)	Analyze the functional point's analysis metrics.	CO2	7 Marks
		(OR)		
8.	a)	What is the role of testing group for conduction of software testing effectively?	CO1	7 Marks
	b)	Discuss the key concepts of Test Organization.	CO1	7 Marks
		UNIT-V		
9.	a)	How to do regression testing? Mention the steps briefly.	CO1	7 Marks
	b)	"Can regression testing be used for measuring the quality of software?". Justify?	CO5	7 Marks
		(OR)		
10.	a)	Explain the need for Automation.	CO1	7 Marks
	b)	Differentiate between Progressive *Vs* Regression Testing.	CO2	7 Marks

CODE No.: 16BT61201 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

CLOUD COMPUTING
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define virtualizations. Explain benefits of virtualizations in enterprises.	CO1	7 Marks
	b)	Write a short note on virtualization technologies.	CO1	7 Marks
		(OR)		
2.	a)	Explain in detail about Hypervisor.	CO1	7 Marks
	b)	Compare and contrast Zen and Virtual Iron.	CO1	7 Marks

UNIT-II

3.	a)	Define cloud computing. Enlist key characteristics of cloud computing.	CO2	7 Marks
	b)	Explain about risks and challenges in cloud computing.	CO2	7 Marks
		(OR)		
4.	a)	List and explain various cloud computing models.	CO2	7 Marks
	b)	Write a note on Cloud Deployment models.	CO2	7 Marks

UNIT-III

5.	a)	Outline Datacenter Technology with an example.	CO3	7 Marks
	b)	Evaluate cloud delivery models.	CO3	7 Marks
		(OR)		
6.	a)	Explain the process of workload distribution in cloud.	CO3	7 Marks
	b)	What is Dynamic Scaling? Explain how applications are scaled in cloud environment.	CO3	7 Marks

UNIT-IV

7.	a)	Compare and Contrast Data , Network and Cloud Security.	CO4	7 Marks
	b)	What are different cloud security solutions?	CO5	7 Marks
		(OR)		
8.		What is Disaster? Explain about Disaster recovery planning and management.	CO5	14 Marks

UNIT-V

9.	a)	Explain SQL Azure & Azure tables.	CO6	7 Marks
	b)	Write a note on Google App Engineer.	CO6	7 Marks
		(OR)		
10.	a)	List the policies of Cloud resource Management (CRM.).	CO6	7 Marks
	b)	What is Amazon S3? Explain in detail.	CO6	7 Marks

CODE No.: 16BT61503 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

SOFTWARE PROJECT MANAGEMENT
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain various objectives used for measurement of software size.	CO1	7 Marks
	b)	Describe five improvements to the basic waterfall process.	CO1	7 Marks
		(OR)		
2.	a)	What is the impact of the documentation and review meetings? Explain about requirements Driven functional decomposition.	CO2	7 Marks
	b)	Compare Iterative and Incremental model to that of waterfall model.	CO2	7 Marks

UNIT-II

3.		Write short notes on: i) Round Trip engineering. ii) Forward Engineering. iii) Reverse engineering.	CO2	14 Marks
		(OR)		
4.	a)	What are the key practices that improve the overall software quality?	CO2	7 Marks
	b)	What are the primary objectives, essential activities and primary evaluation criteria during inception phase? Explain.	CO3	7 Marks

UNIT-III

5.	a)	Discuss about management Artifacts.	CO3	7 Marks
	b)	Explain the significance of software architecture in modern software development process.	CO3	7 Marks
		(OR)		
6.	a)	What are the seven workflows in the lifecycle?	CO3	7 Marks
	b)	What levels of activity take place in these workflows during each of the four phases (Inception, Elaboration, Construction and Transition)?	CO3	7 Marks

UNIT-IV

7.	a)	Write short notes on: i) The iteration planning process. ii) Pragmatic planning.	CO4	7 Marks
	b)	What are three types of joint management reviews? Explain.	CO4	7 Marks
		(OR)		
8.	a)	Discuss about initial operational capability milestone and product release milestone.	CO4	7 Marks
	b)	Define round trip engineering. Explain the concept of round trip engineering and change Management.	CO4	7 Marks

UNIT-V

9.	a)	What is process discriminate? Explain the factors involved in tailoring the process.	CO5	7 Marks
	b)	Explain about next generation software economics.	CO5	7 Marks
		(OR)		
10.	a)	Explain about modern software economics.	CO6	7 Marks
	b)	Discuss in detail about Quality indicators.	CO6	7 Marks

CODE No.: 16BT70101 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

ESTIMATION AND QUANTITY SURVEYING
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. Estimate the following quantities of main items of work from the plan, section of a residential building by Long wall and Short wall method. CO4 14 Marks
   i) Earth work in excavation.
   ii) Brick work in foundation and Superstructure with deductions.
   iii) R.C.C Slab (M20).
   iv) Flooring.

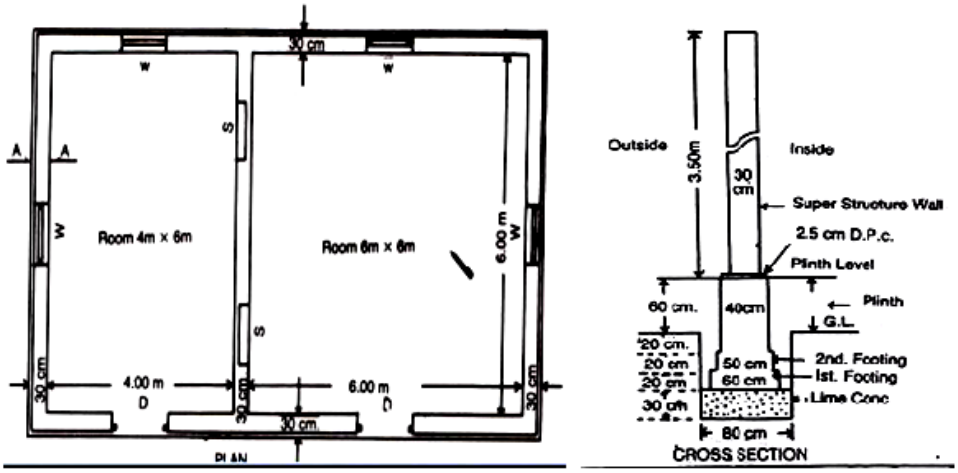


Fig. (1)

(OR)

2. a) Explain detailed estimate and Abstract of estimate with table formats. CO1 8 Marks
   b) Differentiate between long wall and short wall method and center line method with one room example. CO1 6 Marks

UNIT-II

3. Calculate the quantity of earth work on road embankment from chainage 0 to 120 m with the following data. CO4 14 Marks
   Formation width = 10.0 m
   Slope in banking = 2:1
   i) Mid sectional area method. ii) Prismoidal method.

Chainage (m)	0	30	60	90	120
Height of embankment (m)	3.42	2.78	1.62	1.48	1.32

(OR)

4. Prepare a detailed estimate for supplying, laying and jointing 300 mm diameter glazed stone ware pipe line jointing with 1:2 cement mortar. Measurement of trench is 500m x 0.9m x 0.6m. CO2 14 Marks

UNIT-III

5.		Write the detailed specifications for the following items. i) Mosaic flooring. ii) Plastering. iii) Brick work in super structure. iv) RCC work in detail.	CO1	14 Marks

(OR)

6.		List out the units of various items in buildings and also evaluate the cost of the following items of work. i) CC Flooring (1:1:3) with 20 mm thick. ii) Plain cement concrete (1:4:8) for bed concrete. iii) Plastering in CM (1:3) with 12 mm thick for ceiling.	CO2	14 Marks

UNIT-IV

7.		Explain the different types of contract systems. Explain any two methods with their advantages and disadvantages.	CO3	14 Marks

(OR)

8.	a)	What is tender? Explain briefly principles of tendering.	CO1	8 Marks
	b)	Summarize the contents of contract document.	CO1	6 Marks

UNIT-V

9.	a)	Explain the concept of sinking fund.	CO1	4 Marks
	b)	A leasehold property is to produce a net income of Rs.7000/- per annum for the next 40 years. Estimate the value of the property. Assume that the owner requires a return of 8.5% on his capital and that a sinking fund to replace the capital is also to be accumulated at 6%.	CO2	10 Marks

(OR)

10.	a)	Briefly explain the different methods of valuation.	CO1	7 Marks
	b)	Define the term depreciation and explain method of calculating depreciation.	CO3	7 Marks

CODE No.: 16BT70102 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

GEOSPATIAL TECHNOLOGIES
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the following. i) Types of aerial photographs. ii) Geometry of aerial photographs.	CO1	8 Marks
	b)	Explain the role of ground controls in aerial photographs.	CO1	6 Marks
		(OR)		
2.		What is photo mosaic? Discuss the methods used for mosaic construction.	CO1	14 Marks

UNIT-II

3.	a)	Discuss elements of remote sensing.	CO2	7 Marks
	b)	Compare the Spectral reflectance characteristics of vegetation and soil.	CO2	7 Marks
		(OR)		
4.	a)	List the sensor characteristics of LISS and PAN.	CO2	6 Marks
	b)	Define resolution. Explain any three of them.	CO2	8 Marks

UNIT-III

5.	a)	Define GIS? What are the GIS categories?	CO2	7 Marks
	b)	What are the fundamental operations of GIS?	CO2	7 Marks
		(OR)		
6.		Summarize the various map projections.	CO3	14 Marks

UNIT-IV

7.	a)	Explain how spatial data can be entered into GIS.	CO4	7 Marks
	b)	Explain digitization.	CO4	7 Marks
		(OR)		
8.		Classify the segments of GPS. Describe them briefly.	CO6	14 Marks

UNIT-V

9.		Justify the GIS as a tool for flood and drought impact assessment and monitoring.	CO7	14 Marks
		(OR)		
10.		Explain how watershed management for sustainable development can be done using GIS tools.	CO7	14 Marks

CODE No.: 16BT70103 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

RAILWAY, AIRPORT AND HARBOUR ENGINEERING
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	How railway development has been taken place in India? List out advantages of railways.	CO1	7 Marks
	b)	What are the requirements of an ideal rail joint and also explain various types of rail joints with neat sketches.	CO1	7 Marks
		(OR)		
2.	a)	Write a short note on different methods for welding of rails.	CO5	7 Marks
	b)	If the wheel base of a vehicle moving on a BG track is 6m, the diameter of wheel is 1.5m and depth of flange below the top of rail is 3.17cm. Determine the extra width required to be provided on gauge, if the radius of the curve is 170m.	CO6	7 Marks

UNIT-II

3.	a)	Describe in detail about plate laying techniques.	CO5	7 Marks
	b)	Explain various classifications of railway stations.	CO1	7 Marks
		(OR)		
4.		Discuss in detail about the modern methods of maintenance of railway tracks.	CO4	14 Marks

UNIT-III

5.	a)	A new airport is planned to be constructed in Andhra Pradesh for which list the factors to be considered for selection of site.	CO3	7 Marks
	b)	Explain about various aircraft characteristics.	CO1	7 Marks
		(OR)		
6.	a)	Explain the importance of airport planning.	CO1	7 Marks
	b)	Discuss in detail regarding airport lighting.	CO1	7 Marks

UNIT-IV

7.		The runway length required for landing at sea level is standard atmospheric conditions is 3000m. Runway length required for take-off at a level site at sea level in standard atmospheric conditions is 2500m. Aerodrome reference temperature is 25^0C and that of the standard atmospheric at aerodrome elevation of 150m is 14.025^0C. If the effective runway gradient is 0.5 percent, determine the runway length to be provided.	CO3	14 Marks
		(OR)		
8.	a)	Write the detail the various design elements to be considered in taxiway laying as per IS standards.	CO8	7 Marks
	b)	List out the characteristics and requirements of airport drainage. Explain in detail.	CO1	7 Marks

UNIT-V

9.	a)	Discuss various factors to be considered for selecting a suitable site for construction of a port.	CO1	7 Marks
	b)	Explain briefly about different types of harbors with neat sketch.	CO1	7 Marks
		(OR)		
10.	a)	Discuss in detail about the environmental concern required for port operations.	CO7	7 Marks
	b)	Discuss different types of docks.	CO1	7 Marks

CODE No.: 16BT70106 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

ENVIRONMENTAL IMPACT ASSESSMENT AND MANAGEMENT
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	What are the basic concepts of EIA? Explain.	CO1	7 Marks
	b)	How an initial environmental examination helps for a full scale EIA?	CO2	7 Marks
		(OR)		
2.	a)	Explain the different characteristics that the impact evaluation methods should have.	CO5	7 Marks
	b)	Describe the elements of EIA.	CO2	7 Marks
		UNIT-II		
3.	a)	Describe Environmental media Quality Index method in detail.	CO5	7 Marks
	b)	Describe the matrix method of EIA.	CO1	7 Marks
		(OR)		
4.	a)	Give a brief account on cost benefit analysis of EIA.	CO2	7 Marks
	b)	Discuss about the need of EIA for engineering projects.	CO1	7 Marks
		UNIT-III		
5.	a)	Draw the schematic diagram for conceptual approach to the study focused on surface water environment impacts.	CO4	7 Marks
	b)	Write a detailed note on 'compilation of water Quantity-Quality information'.	CO3	7 Marks
		(OR)		
6.		Explain methodology for the assessment impacts on health and safety due to adverse changes in soil environment.	CO5	14 Marks
		UNIT-IV		
7.	a)	Write the steps involved in the EIA assessment of air environment.	CO3	7 Marks
	b)	Explain the development activities on vegetation with example.	CO4	7 Marks
		(OR)		
8.	a)	Differentiate between deforestation and forest degradation.	CO6	7 Marks
	b)	Explain the common causes of deforestation around the world.	CO4	7 Marks
		UNIT-V		
9.	a)	What is meant by Environmental Audit? What are the different objectives of it? Explain.	CO6	7 Marks
	b)	Discuss about the Water Act and the Air Act.	CO7	7 Marks
		(OR)		
10.	a)	Write a short note on Environmental Legislation.	CO8	7 Marks
	b)	Write a short note on Post Audit activities.	CO8	7 Marks

CODE No.: 16BT70113 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

HIGHWAY CONSTRUCTION AND MAINTENANCE
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Mention the steps for construction of new highway on embankment and cutting.	CO1	7 Marks
	b)	Explain the important functions of highway embankment and sub grade in the performance of highway construction.	CO1	7 Marks
		(OR)		
2.	a)	Write a note on importance and construction of drainage layer for cement concrete pavement and dry lean concrete sub base course.	CO2	7 Marks
	b)	Explain with neat sketches, the method of construction of contract joints and expansion joints.	CO1	7 Marks

UNIT-II

3.	a)	Explain the principle application and method of construction of mechanical soil stabilization.	CO1	7 Marks
	b)	Discuss the principles and scope of soil cement stabilization.	CO1	7 Marks
		(OR)		
4.	a)	Mention the advantages and limitations of using soil cement in different pavement layer.	CO5	7 Marks
	b)	Discuss how soil bitumen mix id designed and stabilized road is constructed.	CO4	7 Marks

UNIT-III

5.	a)	Specify the details of geometrics design and standards of hill roads.	CO4	7 Marks
	b)	Mention the importance of sub surface drainage on hill roads.	CO5	7 Marks
		(OR)		
6.	a)	Design the cross section and longitudinal slope of trapezoidal drain assume bottom width of section to be 1m and cross slope to be 1 vertical and 1.6 horizontal. The allowable velocity of flow in the drain is 2.7m/sec and manning's roughness coefficient is 0.02. The maximum quantity of expected water in an open longitudinal drain on clayey soil is $3m^3$/sec	CO3	7 Marks
	b)	Discuss the maintenance problems on hill roads.	CO4	7 Marks

UNIT-IV

7.		Discuss the uses of highway construction equipments i.e bulldozer, grader, scraper	CO1	14 Marks
		(OR)		
8.	a)	Explain the importance of excavators, trucks and hauling equipments in highway construction.	CO1	7 Marks
	b)	Discuss about the equipment used in paving a cement concrete pavement.	CO1	7 Marks

UNIT-V

9.	a)	Explain the importance of preventive maintenance of road works.	CO7	7 Marks
	b)	Write a detailed note on premature failure of flexible pavement.	CO6	7 Marks
		(OR)		
10.	a)	Mention the causes of distress in CC pavements	CO6	7 Marks
	b)	Discuss the special maintenance and care required for road side planting.	CO6	7 Marks

CODE No.: 16BT70114 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

INDUSTRIAL WASTEWATER TREATMENT

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the effect of waste water on self purification capacity of streams.	CO1	7 Marks
	b)	Write a note on characteristics of industrial sewage.	CO1	7 Marks
		OR)		
2.	a)	A stream having a flow of 1 m^3/s and BOD 4 mg/l is saturated with DO. It receives an effluent discharge of 0.25m^3/s having BOD 20 mg/l and DO 4 mg/l. If the average velocity of flow is 0.15 m/s, calculate the DO deficit at points 20 km and 40 km downstream. Assume that the temperature is 20°C through out and BOD is measured at 5 days. Take rate constants for effluent and stream as 0.12 and 0.30 per day respectively, and saturation DO at 20°C as 9.17 mg/l.	CO4	7 Marks
	b)	Write the ISI limits for disposal of effluent into inland surface water and public sewers.	CO8	7 Marks

UNIT-II

3.	a)	Write short note on: i) Equalization. ii) Neutralization. iii) screen chamber. iv) Grit chamber.	CO5	7 Marks
	b)	Distinguish between aerobic, anaerobic and facultative micro-organisms and their role in the biological treatment.	CO1	7 Marks
		(OR)		
4.	a)	Explain the basic operations involved in the activated sludge process with the help of flow diagram.	CO1	7 Marks
	b)	Design a conventional activated sludge plant to treat settled domestic sewage for the following data: i) Population= 10,000 ii) Sewage contribution= 160 lpcd iii) Settled sewage BOD_5 = 200 mg/l iv) Effluent BOD_5 required= 20 mg/l v) F/M= 0.25 vi) MLSS= 3000 mg/l.	CO3	7 Marks

UNIT-III

5.	a)	Explain the process of nitrogen removal by nitrification and denitrification.	CO5	7 Marks
	b)	Write a detail note on the removal of phosphate by anaerobic filters.	CO5	7 Marks
		(OR)		
6.	a)	Write short notes on: i) Thermal reduction. ii) Air stripping. iii) Membrane systems.	CO5	7 Marks
	b)	List out the toxic chemicals present in any industrial wastewater. Explain Oxidation and reduction system to remove toxic chemicals.	CO4	7 Marks

UNIT-IV

7.	a)	Explain the sources and characteristics of wastewater of pulp and paper industry.	CO8	7 Marks
	b)	Explain the methods of treatment and disposal of wastewater from dairy industry.	CO8	7 Marks

(OR)

8.	a)	Draw an outline of sugar plant and explain the stages involved in treatment plant.	CO8	7 Marks
	b)	Discuss in brief the methods of treating wastewater from distillery industry.	CO8	7 Marks

UNIT-V

9.	a)	What are the analytical methods recommended for characterization of wastewater and explain any one method.	CO5	7 Marks
	b)	Write short note on: i) Waste volume and strength reduction. ii) Water conservation.	CO5	7 Marks

(OR)

10.		Discuss the hierarchy of waste management techniques with examples.	CO5	14 Marks

CODE No.: 16BT70120 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January – 2022

GROUND IMPROVEMENT TECHNIQUES

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the factors to be considered in the selection of the best technique for ground improvement.	CO2	7 Marks
	b)	Briefly explain methods for physical ground improvement and chemical ground improvement.	CO1	7 Marks
		(OR)		
2.	a)	List the various methods of ground improvement.	CO1	7 Marks
	b)	Discuss methods to improve performance of Alluvial Soils.	CO5	7 Marks

UNIT-II

3.	a)	Explain Vacuum Dewatering method in detail. Discuss the environmental effect of Vacuum Dewatering.	CO7	7 Marks
	b)	List the available dewatering methods for fine soils. Explain any one method in detail.	CO2	7 Marks
		(OR)		
4.	a)	Explain Electro-Kinetic Dewatering system in detail.	CO4	7 Marks
	b)	Explain well point system for dewatering of soil.	CO1	7 Marks

UNIT-III

5.	a)	Discuss the principles of In-situ soil densification. List the various methods of In-situ densification of granular soils.	CO1	7 Marks
	b)	Discuss the thermal methods for densification of cohesive soils.	CO4	7 Marks
		(OR)		
6.	a)	Explain in detail about Dynamic Compaction and Vibro-Compaction.	CO4	7 Marks
	b)	Discuss in detail about Blasting and Granular piles for densification of soils.	CO4	7 Marks

UNIT-IV

7.	a)	What are various soil stabilization techniques? Discuss their suitability with respect to type of soil.	CO1	7 Marks
	b)	Write short notes on soil stabilization using Grouting.	CO4	7 Marks
		(OR)		
8.	a)	Write short notes on Mechanical Stabilization and Bitumen Stabilization.	CO4	7 Marks
	b)	Write short notes on types of grouts, injection methods and Grout monitoring.	CO1	7 Marks

UNIT-V

9.	a)	Explain the concept of Soil Reinforcement. List the materials suitable to be used as Soil Reinforcement. Discuss the internal safety aspects of Reinforced Earth Walls.	CO6	7 Marks
	b)	Explain the components and applications of Reinforced Earth.	CO5	7 Marks
		(OR)		
10.	a)	Discuss the construction sequence of a Reinforced Earth wall with vertical faces.	CO3	7 Marks
	b)	Discuss one application each of Geomembrane and Geogrid reinforcements.	CO5	7 Marks

❀ ❀ ❀

CODE No.: 16BT70124 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January – 2022

REHABILITATION AND RETROFITTING OF STRUCTURES

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Explain the various causes for deterioration of concrete structures.	CO1	7 Marks
	b)	Explain the various categories of inspection based on method and Interval.	CO1	7 Marks
		OR)		
2.	a)	Distinguish between repair and rehabilitation.	CO1	7 Marks
	b)	Illustrate in detail the six facets of maintenance.	CO1	7 Marks
		UNIT-II		
3.	a)	Explain the parameters affecting the quality of concrete Construction.	CO2	7 Marks
	b)	Explain the components of quality assurance for building.	CO2	7 Marks
		(OR)		
4.	a)	Explain the factors Influencing Strength of Concrete.	CO2	7 Marks
	b)	Define durability of concrete. How much importance should be given for durability in design and construction?	CO2	7 Marks
		UNIT-III		
5.	a)	Demonstrate the arrangement of vacuum treatment of concrete.	CO3	7 Marks
	b)	Explain Polymer Impregnated Concrete.	CO3	7 Marks
		(OR)		
6.	a)	Ilustrate Polymer Concrete (PC) in detail .	CO3	7 Marks
	b)	Discuss the procedure of properties, manufacture and uses of fiber reinforced concrete.	CO3	7 Marks
		UNIT-IV		
7.	a)	Explain the process of epoxy injection. Also explain routing and scaling with sketches.	CO4	7 Marks
	b)	Describe the preliminary procedures in demolition of a structure.	CO4	7 Marks
		(OR)		
8.	a)	Describe in detail about the impulsion method of demolition of structures.	CO4	7 Marks
	b)	Discuss the procedure of fusion bonded epoxy coating of rebars with a simple sketch. Also give the advantages and disadvantages.	CO4	7 Marks
		UNIT-V		
9.	a)	Explain the techniques available for protection of rebar.	CO5	7 Marks
	b)	Illustrate about polymer coating for rebars during repair.	CO5	7 Marks
		(OR)		
10.	a)	Write short notes on Shoring and Underpinning.	CO5	7 Marks
	b)	Discuss about Epoxy bonded epoxy motor.	CO5	7 Marks

CODE No.: 16BT70201 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

POWER SYSTEM OPERATION AND CONTROL
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	The input –output curve characteristics of three units are: $F_1=750+6.49\ P_{G1}+0.0035P_{G1}^2$; $F_2=870+5.75P_{G2}+0.0015P_{G2}^2$; $F_3=620+8.56\ P_{G3}+0.001P_{G3}^2$; The fuel cost of unit 1, 2, 3 is 1.0 Rs / Mbtu. Total load is 800 MW. Calculate the economic load dispatch for a load is increased to 880 MW.	CO4	8 Marks
	b)	Derive relevant equations and state the significance and role of penalty factor.	CO1	6 Marks

(OR)

2.	a)	Derive coordination equation for economic dispatch including losses, in the power system. Give steps for economic dispatch calculation. Neglecting losses.	CO1	8 Marks
	b)	What are B- coefficients? Derive them.	CO1	6 Marks

UNIT-II

3.		Describe the hydro-thermal economic load scheduling. Derive the necessary equations.	CO2	14 Marks

(OR)

4.	a)	In a two plant operation system, the hydro plant is operated for 10 hrs, during each day and the steam plant is to operate all over the day. The characteristics of the steam and hydro plants are: $CT = 0.04\ PGT^2 + 30\ PGT + 10$ Rs./hr $WH = 0.12\ PGH^2 + 30\ PGH\ m^3/sec$ When both plants are running, the power owned from steam plant to load is 150 MW and the total quantity of water is used for the hydro plant operation during 10 hrs is $150 \times 10^6 m^3$. Determine the generation of hydro plant and cost of water used. Neglect the transmission losses.	CO4	10 Marks
	b)	Discuss the disadvantages of operation of power plants with hydro thermal combinations.	CO1	4 Marks

UNIT-III

5.		Discuss in detail, the priority list method for the solution of unit commitment problem with an example.	CO2	14 Marks

(OR)

6.	a)	Explain dynamic programming method using full load average production cost. State the merits and demerits.	CO1	5 Marks
	b)	Using the Dynamic programming method, how do you find the most economical combination of the units to meet a particular load demand?	CO2	9 Marks

UNIT-IV

7.	a)	Design a static var compensator for a low voltage distribution system with the following specifications, System Voltage=400V Frequency, f=50Hz Coil inductance L=5.37mH The inductor saturates at 950A and settles of 1.8mH at 1800A. Compensation is required over a range of -80KVAR to +30KVAR per phase.	CO3	8 Marks
	b)	Brief the merits of uncompensated transmission lines over compensated transmission lines.	CO2	6 Marks

(OR)

8.	a)	Compare the different types of compensating equipment for transmission system.	CO2	5 Marks
	b)	With a neat sketch, explain how a Series compensation of transmission system.	CO5	9 Marks

UNIT-V

9.	a)	What are the components of speed governor system of an alternator? Derive a transfer function and sketch a block diagram.	CO3	9 Marks
	b)	"Load frequency and economic dispatch control of the control area power system play a vital role", Justify with a neat diagram.	CO1	5 Marks

(OR)

10.	a)	With a neat block diagram, explain the single area load frequency control system.	CO3	6 Marks
	b)	Explain the effect of integral gain on the performance of load frequency control in two area load frequency control.	CO6	8 Marks

CODE No.: 16BT70202 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

SWITCHGEAR AND PROTECTION
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Analyze the difference between the fuse and relay with an example.	CO2	7 Marks
	b)	Explain the construction and working of directional over current relay and its use.	CO1	7 Marks
		(OR)		
2.	a)	How amplitude comparator is used in the protective relay system? Explain with neat sketch.	CO2	7 Marks
	b)	List various advantages and disadvantages microprocessor based relays and draw its basic block diagram.	CO1	7 Marks
		UNIT-II		
3.	a)	Explain the construction and operation air blast circuit breaker with neat sketch.	CO1	7 Marks
	b)	Describe the construction and working of maximum oil circuit breaker with neat sketch and its merits.	CO1	7 Marks
		(OR)		
4.	a)	Explain the various types of fuses and draw its characteristics.	CO1	8 Marks
	b)	Explain the following terms. i) Current chopping. ii) Resistance switching.	CO1	6 Marks
		UNIT-III		
5.	a)	The neutral point of a three phase 20MVA, 11kV alternator is earthed through a resistance of 5Ω; the relay is set to operate when there is an out of balance current of 1.5A. The CT's have a ratio of 1000/5A. What is the percentage of winding protected? Also calculate the earthing resistance required to protect 90% of the winding.	CO3	7 Marks
	b)	Explain the restricted earth fault protection in detail.	CO1	7 Marks
		(OR)		
6.	a)	How to design current transformer ratios? Explain in detail.	CO2	7 Marks
	b)	Determine the ratios of CT's to be used on high voltage side, if a 3-phase transformer rated for 33/6.6kV is Y-Δ connected and the protection current transformers on the low voltage side have a ratio of 300/5A.	CO4	7 Marks
		UNIT-IV		
7.	a)	Discuss and compare briefly various bus bar arrangements in a power system.	CO1	7 Marks
	b)	Explain about carrier current protection of transmission lines with a neat sketch.	CO1	7 Marks
		(OR)		
8.	a)	What are surge absorbers and how do they differ from surge diverter?	CO1	7 Marks
	b)	What is the basic impulse level? Explain their significance in power system studies.	CO1	7 Marks

UNIT-V

9.	a)	Explain about effective and resistance grounding with diagrams.	CO1	8 Marks
	b)	Suggest a suitable grounding method for protecting the equipment in the house hold and industrial applications.	CO6	6 Marks

(OR)

10.	a)	Explain the construction and working of Peterson coil grounding and its use.	CO1	7 Marks
	b)	Differentiate the advantages of grounding system over ungrounded systems.	CO2	7 Marks

CODE No.: 16BT70203 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

ENERGY CONSERVATION AND MANAGEMENT
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the different steps that are considered for detailed Energy Audit.	CO1	7 Marks
	b)	Define the terms energy index, pie charts and cost index in the context of energy efficiency.	CO1	7 Marks
		(OR)		
2.	a)	What are the best avenues to conserve energy for factories?	CO2	8 Marks
	b)	Define energy management and explain the importance of energy management.	CO1	6 Marks

UNIT-II

3.		What do you mean by energy conservation? Explain method of energy conservation used in industries.	CO4	14 Marks
		(OR)		
4.		Explain the energy conservation techniques used to reduce energy cost.	CO3	14 Marks

UNIT-III

5.	a)	Explain the concept of energy efficient motors and write the advantages and disadvantages of energy efficient motors.	CO5	8 Marks
	b)	Write the features of energy efficient motors.	CO1	6 Marks
		(OR)		
6.	a)	Explain any two methods adopted in energy efficient lighting systems.	CO5	7 Marks
	b)	List and explain energy savings opportunities in industrial lighting systems.	CO4	7 Marks

UNIT-IV

7.	a)	Write the different types of energy audit instruments and explain any two energy audit instruments.	CO5	7 Marks
	b)	Explain the significance of data logger and where there are used.	CO3	7 Marks
		(OR)		
8.	a)	Write the merits and demerits of time value of money.	CO1	7 Marks
	b)	Explain the principle of operation of thermo couple.	CO1	7 Marks

UNIT-V

9.	a)	Explain the terms: i) Peak clipping. ii) Peak shifting. iii) Valley filling.	CO1	7 Marks
	b)	Briefly explain the DSM planning and implementation.	CO2	7 Marks
		(OR)		
10.	a)	Write a note on Demand side management issues.	CO2	7 Marks
	b)	Explain multi-utility power exchange model.	CO1	7 Marks

CODE No.: 16BT70204 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

FLEXIBLE AC TRANSMISSION SYSTEMS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Derive the expression for active as well as reactive power flow in a lossless transmission line and draw its necessary phasor diagram.	CO2	7 Marks
	b)	Discuss importance of controllable parameters in transmission systems.	CO2	7 Marks
		(OR)		
2.	a)	Identify various stability issues that limit the transmission capabilities.	CO3	7 Marks
	b)	Explain the objective of FACTS controllers in the power system network.	CO1	7 Marks

UNIT-II

3.	a)	Explain significance of reactive power in electrical power transmission lines.	CO1	7 Marks
	b)	Describe the control of reactive power in electrical power transmission lines.	CO2	7 Marks
		(OR)		
4.	a)	How shunt compensation effects on power transfer capacity of transmission line?	CO4	7 Marks
	b)	Discuss the specification of the load compensation.	CO2	7 Marks

UNIT-III

5.	a)	Discuss the working and characteristics of TCR with relevant diagrams.	CO2	7 Marks
	b)	How shunt compensation improve transient stability?	CO4	7 Marks
		(OR)		
6.	a)	Briefly describe how transient is improved using STATCOM.	CO4	7 Marks
	b)	Differentiate SVC and STATCOM.	CO2	7 Marks

UNIT-IV

7.	a)	Discuss the working and characteristics of TCSC with relevant diagrams.	CO1	7 Marks
	b)	Design a block diagram for functional control of GCSC.	CO3	7 Marks
		(OR)		
8.	a)	Describe the working and characteristics of SSSC with relevant diagrams.	CO1	7 Marks
	b)	How do you improve transient stability using static series compensation?	CO4	7 Marks

UNIT-V

9.	a)	Describe transient stability enhancement can be solved by using phase angle regulators.	CO5	7 Marks
	b)	Configure thyristor tap changer for continuous and discrete control of TCVR and describe.	CO4	7 Marks
		(OR)		
10.	a)	Design the basic structure of UPFC.	CO3	7 Marks
	b)	Discuss the basic working principle of IPFC.	CO2	7 Marks

CODE No.: 16BT70205 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

POWER SYSTEM AUTOMATION
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Illustrate the latest developments of operation and control in power system.	CO6	7 Marks
	b)	Describe the Operator activities in power system control.	CO1	7 Marks
		(OR)		
2.	a)	List and explain about the elements of computer control system.	CO2	7 Marks
	b)	Explain about time and mode decomposition in power system operation and control.	CO1	7 Marks

UNIT-II

3.	a)	Define SCADA and state its desirable properties.	CO1	7 Marks
	b)	Explain SCADA architecture in detail.	CO3	7 Marks
		(OR)		
4.	a)	Define RTU, HMI and IED.	CO1	7 Marks
	b)	Explain SCADA systems in operation and control of interconnected power system.	CO4	7 Marks

UNIT-III

5.	a)	List the advantages of substation automation.	CO2	7 Marks
	b)	Describe the substation automation architectures with neat sketches.	CO3	7 Marks
		(OR)		
6.		Illustrate about various equipment used in new integrated digital substation.	CO2	14 Marks

UNIT-IV

7.	a)	What are the hardware and software requirements of distribution automation?	CO2	7 Marks
	b)	State and explain the need for Distribution automation.	CO1	7 Marks
		(OR)		
8.	a)	List the advanced analytical Distributed Management System applications.	CO5	7 Marks
	b)	Explain about the Distributed Management System framework integration with subsystem.	CO5	7 Marks

UNIT-V

9.	a)	What is the need of deregulation in power system and also list its advantages?	CO1	7 Marks
	b)	Describe the concept of Power Exchange in power system restructuring.	CO1	7 Marks
		(OR)		
10.	a)	Explain various ISO (Independent System Operator) models.	CO1	7 Marks
	b)	Explain the various transmission pricing methods in power system restructuring.	CO5	7 Marks

CODE No.: 16BT70208 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

POWER QUALITY
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define power quality and state the various reasons for poor power quality.	CO1	7 Marks
	b)	Describe about CBEMA and ITIC curves.	CO5	7 Marks
		(OR)		
2.		Discus the responsibilities of power suppliers and power users to maintain the power Quality in the grid connected power system	CO6	14 Marks

UNIT-II

3.	a)	Differentiate impulsive and oscillatory transients.	CO2	7 Marks
	b)	Differentiate among over voltages, under voltages, sags and swells in power system.	CO2	7 Marks
		(OR)		
4.	a)	Explain various sources of voltage sags and interruptions in power system.	CO1	7 Marks
	b)	Discus various methods of voltage sag mitigation methods.	CO4	7 Marks

UNIT-III

5.	a)	Differentiate transients versus harmonic distortion.	CO2	7 Marks
	b)	Discuss about harmonic sources from commercial loads.	CO3	7 Marks
		(OR)		
6.		Explain the design aspects of passive harmonic filter and state the standards on Harmonics.	CO3	14 Marks

UNIT-IV

7.	a)	Explain about various power quality measuring instruments.	CO5	7 Marks
	b)	State the significance and objectives of power quality monitoring.	CO1	7 Marks
		(OR)		
8.	a)	Describe historical perspective of power quality measuring instruments.	CO1	7 Marks
	b)	Explain assessment of power quality measurement data.	CO2	7 Marks

UNIT-V

9.	a)	Discuss the distributed generation connection requirements and impacts on the network.	CO6	7 Marks
	b)	Explain the interconnection and optimal location of DG in power system network.	CO6	7 Marks
		(OR)		
10.	a)	Describe various protection issues for distributed generation.	CO4	7 Marks
	b)	Explain various technologies for distributed generation.	CO1	7 Marks

CODE No.: 16BT70209 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

SMART GRID TECHNOLOGY
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Write a short note on "need of electricity". Draw the power distribution diagram defining all the sections of power grid.	CO1	7 Marks
	b)	Differentiate between resilience grid and self-healing grid.	CO1	7 Marks
		(OR)		
2.	a)	Describe the opportunities and challenges related to smart grid.	CO1	7 Marks
	b)	Discuss about present development in smart grid considering any one case study.	CO1	7 Marks

UNIT-II

3.	a)	Give the functions of Distribution management system.	CO2	7 Marks
	b)	Briefly discuss about Wide area monitoring system and its applications.	CO2	7 Marks
		(OR)		
4.		Develop functional models of : i) Substation automation. ii) Feeder automation.	CO2	14 Marks

UNIT-III

5.	a)	Compare conventional metering with smart metering.	CO3	7 Marks
	b)	Give importance of HAN in smart grid.	CO3	7 Marks
		(OR)		
6.		Discuss about various services provided by Demand side Integration in smart grid environment.	CO3	14 Marks

UNIT-IV

7.	a)	Why is it necessary to develop power quality monitoring systems in modern electrical grids with renewable interfacing?	CO4	7 Marks
	b)	Describe the functions of Electromagnetic Compatibility (EMC) in smart grids.	CO4	7 Marks
		(OR)		
8.		Develop schematic diagrams for hardware and software requirements for web based power quality monitoring systems.	CO4	14 Marks

UNIT-V

9.		Compare wired and wireless communication channels for smart grid applications.	CO5	14 Marks
		(OR)		
10.		Explain any four Networks used for communication in smart grid environment.	CO5	14 Marks

CODE No.: 16BT70210 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

SOFT COMPUTING TECHNIQUES

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Illustrate the advantages of Neural Network and explain different disciplinary point of Neural Network.	CO1	7 Marks
	b)	Explain the concept of Biological Neural Network and demonstrate with a suitable example.	CO1	7 Marks
		OR)		
2.	a)	Describe the basic models of ANN.	CO1	7 Marks
	b)	Demonstrate the concept of McCulloch Pitts Neural Network Model and explain with a suitable example.	CO1	7 Marks

UNIT-II

3.	a)	Illustrate the architecture of Back propagation Network and describe the process with a flowchart.	CO2	6 Marks
	b)	Solve OR function with binary inputs and bipolar targets using perceptron training algorithm up to 5 epochs.	CO2	8 Marks
		(OR)		
4.	a)	List and explain different activation functions for BAM.	CO3	7 Marks
	b)	Analyze the concept of Hamming Distance and Energy function.	CO3	7 Marks

UNIT-III

5.	a)	Illustrate the Properties of Crisp set and Fuzzy Set.	CO3	7 Marks
	b)	Describe the cardinality of fuzzy relations.	CO3	7 Marks
		(OR)		
6.		Summarize the following: i) Operations of Fuzzy Relations. ii) Fuzzy Cartesian Product.	CO3	14 Marks

UNIT-IV

7.	a)	Illustrate the concept of defuzzification methods.	CO4	6 Marks
	b)	Two Fuzzy relations are given. Find Max-product composition of above two relations	CO4	8 Marks

R	y_1	y_2	y_3
x_1	0.4	0.6	0
x_2	0.9	1	0.1

S	z_1	z_2
y_1	0.5	0.8
y_2	0.1	1
y_3	0	0.6

(OR)

8.		Describe the following: i) Aggregation of Rules. ii) Decomposition of Rules.	CO4	14 Marks

UNIT-V

9.	a)	Illustrate the Advantages and Limitations of Genetic Algorithm	CO5	7 Marks
	b)	Differentiate Single point and Two Point Crossover in Genetic Algorithm	CO5	7 Marks

(OR)

10.	a)	Solve the problem of maximizing the function $f(x) = x^2$. Where x is permitted to vary between 0 and 31.	CO5	8 Marks
	b)	Differentiate Encoding and Decoding and compare these techniques with an example.	CO5	6 Marks

CODE No.: 16BT70301 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

AUTOMOBILE ENGINEERING
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What are the advantages of front and rear wheel drives?	CO1	7 Marks
	b)	Explain the necessity of Super charger and its working with a neat sketch.	CO2	7 Marks
		(OR)		
2.		Explain construction and working of Fuel Injection Pump with a neat sketch.	CO2	14 Marks

UNIT-II

3.	a)	Explain the working of Coil ignition system with a neat sketch.	CO1	10 Marks
	b)	What are the requirements of a spark plug?	CO1	4 Marks
		(OR)		
4.	a)	What are the advantages and disadvantages of air cooling system?	CO3	5 Marks
	b)	With a neat sketch, explain the working of forced circulation cooling system of automobile.	CO1	9 Marks

UNIT-III

5.	a)	Explain briefly the Bharat stage-V pollution standards.	CO6	7 Marks
	b)	What is a catalytic converter? Explain its importance.	CO5	7 Marks
		(OR)		
6.	a)	Explain briefly the pollution control techniques for CI engines.	CO5	7 Marks
	b)	What are the merits and demerits of Biomass and LPG fuels?	CO4	7 Marks

UNIT-IV

7.	a)	Explain clearly double de-clutching.	CO1	4 Marks
	b)	Explain the working of Centrifugal clutch with a neat sketch.	CO1	10 Marks
		(OR)		
8.	a)	Define the following. i) Castor. ii) Camber. iii) Kingpin Inclination.	CO1	3 Marks
	b)	Explain the working of power steering with a neat sketch.	CO1	11 Marks

UNIT-V

9.	a)	Write short notes on stub axles.	CO1	6 Marks
	b)	Explain the function of full floating and semi-floating axles with the help of neat sketches.	CO1	8 Marks
		(OR)		
10.		Explain construction and working of Master cylinder of hydraulic braking system with a neat sketch.	CO1	14 Marks

CODE No.: 16BT70302 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

FINITE ELEMENT METHOD

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Derive the equations of equilibrium for a three dimensional body. CO1 9 Marks
   b) Explain essential and natural boundary conditions. CO1 5 Marks

(OR)

2. Derive element stiffness matrix and force vectors for one dimensional bar element. CO1 14 Marks

UNIT-II

3. For the two-bar truss shown in Fig.1. Determine the displacements of node 1 and the stress in element 1-3. CO2 14 Marks

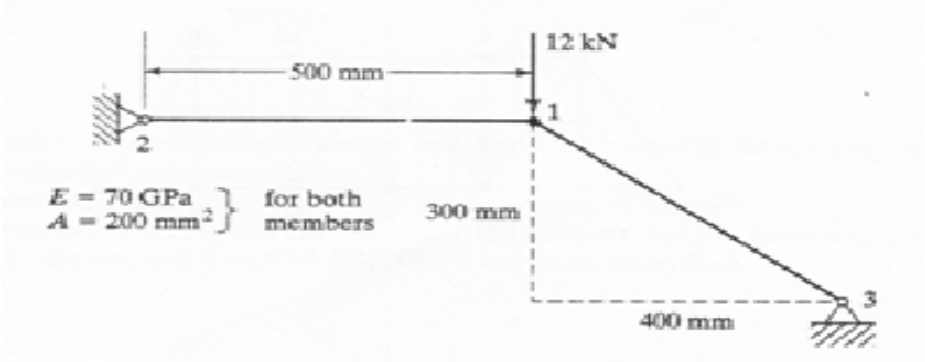


Fig.1

(OR)

4. For the beam and loading shown in fig 2. Determine the slopes at 2 and 3. CO2 14 Marks

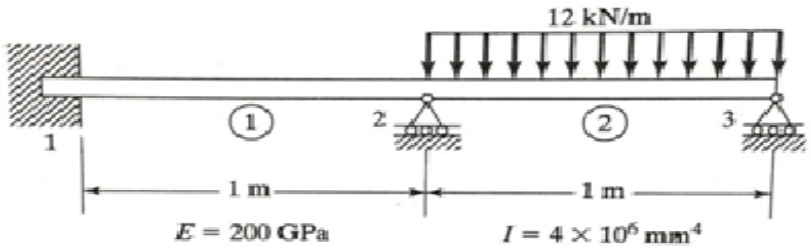


Fig.2

UNIT-III

5. For the triangular element shown in Fig.3.Obtain the strain-displacements relation matrix B and determine the strains εx, εy, and γxy. CO3 14 Marks

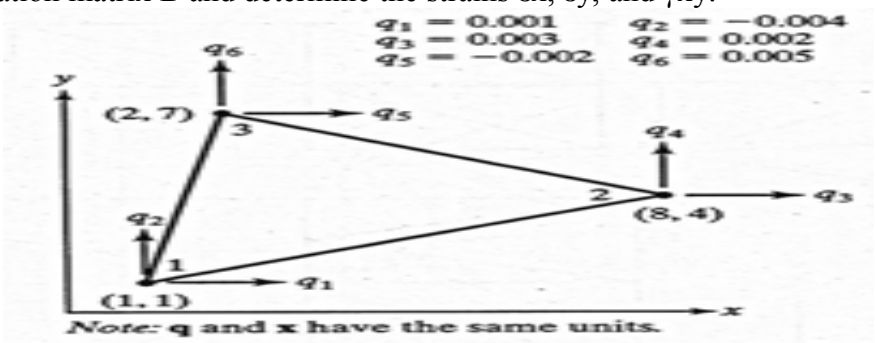


Fig.3

(OR)

6. Derive B matrix for axisymmetric triangular element. CO3 14 Marks

UNIT-IV

7. a) Derive w_1, w_2 and ξ_1, ξ_2 for 2 point formula. CO4 6 Marks

b) Evaluate using two point gauss quadrature. $I = \int_{-1}^{1} \left[3e^x + x^2 + \frac{1}{(x+2)} \right] dx$. CO4 8 Marks

(OR)

8. A composite wall consists of three materials, as shown in Fig.4 the outer temperature is T_o= 20°C.Convection heat transfer takes place on the inner surface of the wall with T_∞ = 800°C and h = 25 W/m^2.°C. Determine the temperature distribution in the wall. CO4 14 Marks

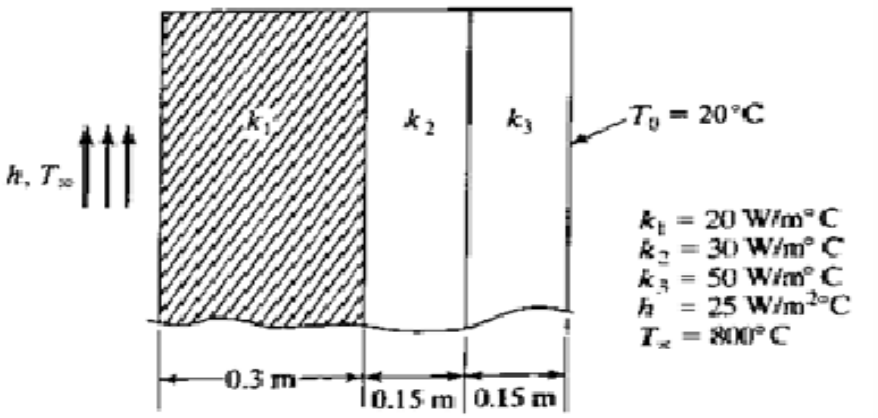
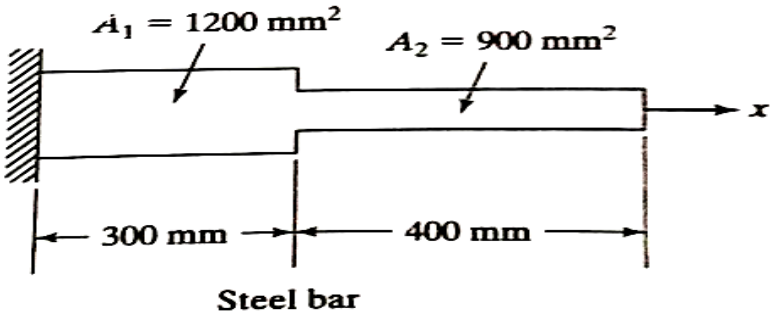


Fig.4

UNIT-V

9. Consider axial vibration of the steel bar shown. Determine the natural frequencies. CO5 14 Marks



Steel bar

(OR)

10. a) State Hamilton principle and explain with an example. CO5 10 Marks

b) Write lumped mass matrix for bar and truss elements. CO5 4 Marks

CODE No.: 16BT70303 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

OPERATIONS RESEARCH
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. Solve the following problem through graphically. CO1 14 Marks

Max $Z= 3X_1+2X_2$
S/t $X_1-2X_2 \leq 1$
$X_1+X_2 \geq 3$
$X_1, X_2 \geq 0$

(OR)

2. Solve the following problem through BIG-M method. CO2 14 Marks

Max $Z= 3X_1+2X_2$
S/t $X_1-X_2 \leq 1$
$X_1+X_2 \geq 3$
$X_1, X_2 \geq 0$

UNIT-II

3. A Company has 5 Jobs and 5 Persons to be performed. Time for each Person would take to perform each job is given in the following matrix. How the jobs should be allocated to each person so as to minimize the total time. CO4 14 Marks

Jobs

Persons	A	B	C	D	E
1	2	9	2	7	1
2	6	8	7	6	1
3	4	6	5	3	1
4	4	2	7	3	1
5	4	3	9	5	1

(OR)

4. A Company has 4 Sources which supplies goods to 3 destinations. Monthly Source supplies and destinations demand requirements are shown below. Unit shipping costs are also given in table. Determine the optimum distribution for this company to minimize shipping costs. CO3 14 Marks

Destination

Source	1	2	3	Supply
1	2	7	4	5
2	3	3	1	8
3	5	4	7	7
4	1	6	2	14
Demand	7	9	18	

UNIT-III

5. Solve the following game whose payoff matrix for Player-A is given below and Find the solution to the game. CO6 14 Marks

	Player-B				
Player-A	-2	0	0	5	3
	3	2	1	2	2
	-4	-3	0	-2	6
	5	3	-4	2	-6

(OR)

6. Solve the following game whose payoff matrix for player-A is given below and find the solution to the game. CO6 14 Marks

	Player-B	
Player-A	5	1
	3	4

UNIT-IV

7. Draw Network diagram and find Critical path, Project duration, Slack for all events, Probability of completing the projection 41 days from the following data. CO5 14 Marks

Activity (i-j)	Duration (days)		
	Optimistic time	Most likely time	Pessimistic time
1-2	3	6	15
1-6	2	5	14
2-3	6	12	30
2-4	2	5	8
3-5	5	11	17
4-5	3	6	15
6-7	3	9	27
5-8	1	4	7
7-8	4	19	28

(OR)

8. Consider the following Project, Construct the Network diagram and find Critical Path, Project Duration, Critical Activities and Non-critical Activities, Total Float and Free Float. CO5 14 Marks

Activity	Precedence	Duration
A	-	5
B	A	7
C	A	9
D	B	4
E	C	8
F	D,E	7

UNIT-V

9. A bakery keeps stock of popular brand of bread previous experience indicates the daily demand as given below. CO5 14 Marks

Daily Demand	Probability
0	0.01
10	0.2
20	0.15
30	0.5
40	0.12
50	0.02

Random Numbers: 48, 78, 19, 51, 56, 77, 15, 14, 86, 8.
Using the above sequence simulate the demand for next 10 days. Find out stock situation, if owner of Bakery decides to make 30 breads every day. Estimate the daily average demand for bread on the basis of simulated data.

(OR)

10. The Director of finance for a firm cooperative is concerned about the yields per acre. He can expect about this year corn crop, the probability distribution of the yields for the current weather conditions is given below. He would like to simulation of yield and he might expect over 10 years. Simulate the average yield by using the following random numbers 20, 72, 34, 54, 30, 22, 48, 74, 76, 2. CO5 14 Marks

Yield in Kg/acre	Probability
120	0.18
140	0.26
160	0.44
180	0.12

CODE No.: 16BT70304 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

CRYOGENICS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What is the necessity of low temperature?	CO1	6 Marks
	b)	Explain the limitations of vapour compression refrigeration system for low temperature applications.	CO2	8 Marks
		(OR)		
2.		Discuss multi-stage refrigeration system with a neat sketch in detail.	CO1	14 Marks

UNIT-II

3.		List out the desired properties of cryogenic fluids and explain.	CO2	14 Marks
		(OR)		
4.	a)	Describe different molecular forms of hydrogen.	CO1	4 Marks
	b)	Discuss the properties of helium isotopes at cryogenics range.	CO3	10 Marks

UNIT-III

5.		Explain the different methods of liquefication of air. Discuss about Claude system in detail.	CO2	14 Marks
		(OR)		
6.	a)	Discuss Joule's Thomson effect.	CO1	7 Marks
	b)	Explain liquification of hydrogen.	CO2	7 Marks

UNIT-IV

7.		List out the applications of cryogenic refrigeration system and explain.	CO4	14 Marks
		(OR)		
8.		Write a note on low temperature properties of engineering materials.	CO4	14 Marks

UNIT-V

9.		List out health hazards of cryogenic liquids and explain.	CO5	14 Marks
		(OR)		
10.		What are different insulations used in cryogenic equipment and explain any two types of insulations?	CO5	14 Marks

CODE No.: 16BT70306 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

QUALITY MANAGEMENT AND RELIABILITY ENGINEERING

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Explain the customers' perception of quality. CO1 7 Marks
   b) Explain the dimensions of product and service quality. CO1 7 Marks

(OR)

2. a) Explain the role of Deming Cycle in continuous quality improvement. CO1 7 Marks
   b) Describe the principles of six sigma. Explain its applications. CO1 7 Marks

UNIT-II

3. a) Explain the causes of variation of quality of product or process. CO5 7 Marks
   b) Differentiate between "Variable charts" and "Attribute charts". CO5 7 Marks

(OR)

4. In a factory producing spark plug the number of defectives found in inspection of 20 lots of 100 each , is given below: CO5 14 Marks

Lot No.	1	2	3	4	5	6	7	8	9	10
No. of Defectives	**5**	**10**	**12**	**8**	**6**	**4**	**6**	**3**	**3**	**5**
Lot No.	11	12	13	14	15	16	17	18	19	20
No. of Defectives	**4**	**7**	**8**	**3**	**3**	**4**	**5**	**8**	**6**	**10**

Construct appropriate control chart and state whether the process is in statistical control.

UNIT-III

5. a) Define the following terms. CO2 4 Marks
   i) AQL. ii) LTPD. iii) IQL. iv) AOQ.
   b) Describe the different types of sampling plans. CO2 10 Marks

(OR)

6. Use the cumulative Poisson table to construct an OC curve for this sample plan $N = 5000$; $n = 80$; $c = 2$. CO2 14 Marks

UNIT-IV

7. A system is composed of 10 components connected in series. Each component has an exponential time to failure distribution with a constant failure rate of 0.5 per 4000 hours. Compute the reliability of the system for 2000 hours of operation and find MTTF. CO3 14 Marks

(OR)

8. a) Explain the following. CO3 7 Marks
   i) MTTF, MTBF. ii) Weibull Distribution.
   b) How Reliability of a system could be enhanced? CO6 7 Marks

UNIT-V

9. a) What do you mean by redundancy? Explain with an example. CO4 7 Marks
   b) What is the role of Optimization in Reliability calculation? CO4 7 Marks

(OR)

10. a) Discuss the following. CO4 7 Marks
    i) Fault tree analysis. ii) Maintainability.
    b) How do you apply reliability to the maintenance programme? CO4 7 Marks

CODE No.: 16BT70309 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

INDUSTRIAL ROBOTICS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Describe the function of the four basic components of robot.	CO1	8 Marks
	b)	What do you understand by degree of freedom (DOF)? How many DOFs are required to position an end effector at any point in 3-D space?	CO1	6 Marks
		(OR)		
2.		Write short notes on: i) Vacuum Grippers. ii) Magnetic Grippers.	CO1	14 Marks
		UNIT-II		
3.		Describe the various power transmission devices used in robotics system with neat sketches.	CO2	14 Marks
		(OR)		
4.	a)	Explain the working of a hydraulic drive system used in robots.	CO2	7 Marks
	b)	Write short notes on Stepper motors.	CO2	7 Marks
		UNIT-III		
5.		Explain the lagrangian formulation for a planar 2R manipulator	CO1, CO4	14 Marks
		(OR)		
6.	a)	Determine the transformation matrix T that represents a rotation of β^o about x-axis and followed by a rotation of Θ^o about z-axis.	CO2	6 Marks
	b)	Write the homogenous transform matrix for a rotation of 90^o about the z-axis followed by a rotation of -90^o about the axis, followed by a translation of (4, 5,9).	CO2	8 Marks
		UNIT-IV		
7.	a)	Explain the skew motion and joint interpolated motion with path control.	CO1	8 Marks
	b)	Summarize the techniques of demonstrating points to robot space.	CO1	6 Marks
		(OR)		
8.	a)	Discuss any one non-optical position sensor with a neat sketch.	CO5	6 Marks
	b)	Explain Optical encoders in detail.	CO5	8 Marks
		UNIT-V		
9.	a)	Explain in detail manual lead through programming method in robot application.	CO1, CO6	8 Marks
	b)	Describe the capabilities of and limitations of lead through programming.	CO2	6 Marks
		(OR)		
10.	a)	What are the reasons for the successful application of robots in manufacturing industry?	CO6	7 Marks
	b)	Give over view of robot's future and present applications.	CO6	7 Marks

CODE No.: 16BT70311 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

PRODUCTION AND OPERATIONS MANAGEMENT

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss the role of production operations in industry.	CO2	7 Marks
	b)	Explain the role of scientific management in historic development of production systems.	CO2	7 Marks
		(OR)		
2.	a)	Discuss about the how workforce changes, innovation and technology affects productivity.	CO3	7 Marks
	b)	Explain about physical and informational flow in a production system.	CO5	7 Marks

UNIT-II

3.	a)	Explain the objectives and uses of forecasting.	CO1	7 Marks
	b)	Discuss about the moving average and weighted moving methods in forecasting.	CO1	7 Marks
		(OR)		
4.	a)	Explain how forecasting control is done in simple averages and exponential smoothing.	CO1	7 Marks
	b)	A firm uses simple exponential smoothing with $\alpha = 0.2$ to forecast demand. In April the forecast was for 200 units, and the actual demand was for 200 units. The actual demand in may and June was 250 and 260 respectively. Forecast the value for July.	CO4	7 Marks

UNIT-III

5.	a)	What is aggregate planning and explain the Objectives of aggregate planning.	CO1	7 Marks
	b)	Explain level and chase aggregate production planning strategies.	CO1	7 Marks
		(OR)		
6.	a)	Discuss about Magee's modified response model in aggregate planning.	CO1	7 Marks
	b)	Discuss about the functions of Master production schedule.	CO1	7 Marks

UNIT-IV

7.	a)	Discuss about Material Requirement Planning (MRP) logic, and its drawbacks.	CO6	7 Marks
	b)	What do you understand by Enterprise Resource Planning (ERP)? Explain its main functions.	CO4	7 Marks
		(OR)		
8.	a)	Explain the importance of preventive maintenance in production.	CO4	7 Marks
	b)	What is Just-In-Time and Explain the philosophy of Just-In-Time (JIT).	CO4	7 Marks

UNIT-V

9.	a)	Discuss the CDS heuristic in flow shop scheduling.	CO6	7 Marks
	b)	What is flow shop scheduling and give the algorithm for Johnson's rule for n job and 3 machines.	CO6	7 Marks
		(OR)		
10.	a)	Discuss the benefits and risks of supply chain.	CO1	7 Marks
	b)	Explain the role of suppliers in creating an effective supply chain.	CO1	7 Marks

CODE No.: 16BT70312 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January – 2022

POWER PLANT ENGINEERING
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain in brief about coal handling system in a thermal power plant.	CO1	7 Marks
	b)	Discuss the factors to be considered for the site selection of thermal power plants.	CO1	7 Marks

(OR)

2.	a)	What is pulverized fuel firing? List its advantages over other methods.	CO1	7 Marks
	b)	Explain in brief about different dust collectors used in a thermal power plant.	CO1	7 Marks

UNIT-II

3.		With the help of a neat sketch, explain the components of a Diesel power plant.	CO2	14 Marks

(OR)

4.	a)	Give the applications where Gas turbine power plants are preferred and explain the reasons for their use.	CO3	8 Marks
	b)	Compare Open cycle and Closed cycle Gas turbine power plants.	CO2	6 Marks

UNIT-III

5.	a)	What is the use of spillway in a hydroelectric plant? Explain the different types.	CO3	8 Marks
	b)	What are the advantages of hydroelectric plants over other power plants?	CO3	6 Marks

(OR)

6.	a)	What is a moderator? Name common moderators used and discuss their advantages and limitations.	CO2	7 Marks
	b)	With the help of a sketch, explain the working of a Sodium-Graphite reactor.	CO2	7 Marks

UNIT-IV

7.	a)	With the help of a schematic diagram, explain OTEC system and give its merits and limitations.	CO3	7 Marks
	b)	What are the different types of Wind mills? Explain the conditions in which they are used. What are their limitations.	CO3	7 Marks

(OR)

8.	a)	Explain the Solar pond concept in generating electricity.	CO4	7 Marks
	b)	Discuss about thermo electric power generator and what are the materials considered for this conversion.	CO4	7 Marks

UNIT-V

9.	a)	Explain briefly about the following: i) Load curve. ii) Load duration curve.	CO6	4 Marks
	b)	The yearly duration curve of a certain plant can be considered as a straight line from 150 MW to 40 MW. Power is supplied with one generating unit of 100 MW capacity and two units of 50 MW capacities each. Determine: i) Installed capacity. ii) Load factor. iii) Plant factor. iv) Maximum demand. v) Utilization factor.	CO6	10 Marks

(OR)

10.	a)	How the FGD system is useful in the removal of SO2 from thermal plants?	CO5	7 Marks
	b)	What are the methods of storage or disposal of radioactive waste materials?	CO5	7 Marks

CODE No.: 16BT70314 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January – 2022

RAPID PROTOTYPING TECHNOLOGY
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Classify the RP systems with highlighting the applications.	CO2	7 Marks
	b)	Explore the development of RP industry in future.	CO1	7 Marks
		(OR)		
2.	a)	Identify the need for compression in product development.	CO1	7 Marks
	b)	Discuss about the history of the RP systems.	CO1	7 Marks

UNIT-II

3.	a)	Illustrate the 'Stereo-Lithography' system with principle of operation, process parameters, merits and de-merits with neat sketches.	CO3	10 Marks
	b)	List the applications of the 'Selective Laser Sintering' process.	CO2	4 Marks
		(OR)		
4.		What is FDM? Explain the principle of operation, process parameters, merits & de-merits and applications with neat sketches.	CO3	14 Marks

UNIT-III

5.		Illustrate the methodology of the 'Solid Ground Curing' with process parameters and applications with neat sketches.	CO3	14 Marks
		(OR)		
6.		Demonstrate the methodology of the 'Laminated Object Manufacturing' (LOM) with process parameters and applications with neat sketches.	CO3	14 Marks

UNIT-IV

7.		Explain the following Indirect rapid tooling methods. i) Aluminium filled epoxy tooling. ii) Silicon rubber tooling. iii) Spray metal tooling.	CO4	14 Marks
		(OR)		
8.		Differentiate between the Direct and In-direct rapid tooling with examples and highlight the merits and demerits.	CO4	14 Marks

UNIT-V

9.		Discuss about the various parameters influencing the part accuracy, data presentation error, finishing.	CO5	14 Marks
		(OR)		
10.		Explore the methodology for surface generation from point cloud method in RP technology with neat sketches.	CO2	14 Marks

❀ ❀ ❀

CODE No.: 16BT70401 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

CELLULAR AND MOBILE COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Illustrate how cell splitting is implemented is done in cellular systems.	CO2	7 Marks
	b)	Compare different generations of cellular systems.	CO1	7 Marks
		(OR)		
2.	a)	Illustrate the concept of frequency reuse for improving the capacity of cellular system.	CO2	7 Marks
	b)	Summarize various performance criterion for cellular systems.	CO1	7 Marks
		UNIT-II		
3.	a)	Compare and contrast adjacent channel and near end far end interference.	CO1	7 Marks
	b)	Illustrate the role of antenna height, beam titling and power applied on interference and coverage area.	CO2	7 Marks
		(OR)		
4.	a)	Illustrate the need of diversity receiver.	CO3	7 Marks
	b)	Illustrate the effective technique for reducing interference at the receiving end of an antenna.	CO6	7 Marks
		UNIT-III		
5.	a)	Illustrate the concept of propagation over water or flat open area.	CO3	7 Marks
	b)	Give the general formula and remarks for Lee model.	CO3	7 Marks
		(OR)		
6.	a)	Differentiate between different mobile antennas.	CO3	7 Marks
	b)	In a mobile radio environment, the average cell-site antenna height is about 60m, the mobile antenna height is about 2m and communication path length is 4km, compute incident and elevation angle.	CO3	7 Marks
		UNIT-IV		
7.	a)	With neat sketch, explain the concept of hand-off strategies.	CO5	7 Marks
	b)	Compare and contrast the fixed and non fixed channel assignment strategies.	CO4	7 Marks
		(OR)		
8.	a)	Define dropped call rate and develop the expression for dropped call rate.	CO4	7 Marks
	b)	Give the concept of channel sharing and borrowing in brief.	CO4	7 Marks
		UNIT-V		
9.	a)	With neat sketch, explain the GSM subsystems in brief.	CO1	7 Marks
	b)	Give the limitations of conventional mobile systems and how are they overcome by cellular systems.	CO1	7 Marks
		(OR)		
10.	a)	Illustrate the concept of CDMA 2000.	CO6	7 Marks
	b)	With neat sketch, explain the architecture of North American TDMA.	CO1	7 Marks

CODE No.: 16BT70402 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

EMBEDDED SYSTEMS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain what features make the MSP430 suitable for low-power and portable applications.	CO1	7 Marks
	b)	Analyze the Registers in the CPU of the MSP430.	CO1	7 Marks
		(OR)		
2.	a)	Compare and contrast Volatile and Non-volatile Memory.	CO1	7 Marks
	b)	Discuss pin out of MSP430.	CO1	7 Marks

UNIT-II

3.	a)	Derive number of machine cycles for any three instructions.	CO2	7 Marks
	b)	Explore Cycle-by-cycle operation of instructions of two operands with destination as register and indexed.	CO2	7 Marks
		(OR)		
4.	a)	Identify and review the MSP430 Stack Pointer.	CO2	7 Marks
	b)	Compose the program to Copy Blocks of Data using MSP430 instruction set.	CO2	7 Marks

UNIT-III

5.	a)	Detail out what happens when interrupt is requested.	CO2	7 Marks
	b)	Develop embed –c code to Flash Led by Software Delay using function.	CO3	7 Marks
		(OR)		
6.	a)	Explore how MSP430 will be awakening from a Low-Power Mode.	CO4	7 Marks
	b)	Elaborate the key Issues Associated with Interrupts.	CO4	7 Marks

UNIT-IV

7.	a)	Demonstrate the working SD16_A sigma–delta ADC Block using diagram.	CO5	7 Marks
	b)	Develop a code which displays the temperature measured by the internal sensor on the LCD to a resolution of 0.1ºC using ADC12.	CO5	7 Marks
		(OR)		
8.	a)	Construct a Relaxation oscillator based on Comparator A+.	CO5	7 Marks
	b)	Paraphrase the usage on ADC10 in MSP430.	CO5	7 Marks

UNIT-V

9.	a)	Elaborate the Device-To-Cloud Communications model in Internet Of Things.	CO6	7 Marks
	b)	Discuss IOT related security challenges in detail.	CO6	7 Marks
		(OR)		
10.		Discuss Key Considerations and Challenges in IOT Interoperability / Standards	CO6	14 Marks

CODE No.: 16BT70403 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

MICROWAVE ENGINEERING
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain construction details and operation of circulator.	CO5	7 Marks
	b)	A Three-port circulator has an insertion loss of 1dB isolation 30dB and VSWR = 1.5. Find the scattering matrix.	CO4	7 Marks
		(OR)		
2.	a)	Write a short note on various wave guide attenuators.	CO1	7 Marks
	b)	Discuss briefly about various coupling mechanism in wave guide discontinuities.	CO1	7 Marks

UNIT-II

3.	a)	Derive the expression for output power and efficiency of a reflex klystron.	CO4	7 Marks
	b)	What are differences between O-type and M-type tubes?	CO1	7 Marks
		(OR)		
4.	a)	Explain the operation of cylindrical travelling wave magnetron.	CO1	7 Marks
	b)	Explain, how amplification process takes place in TWT.	CO2	7 Marks

UNIT-III

5.	a)	Write a short note on Transfer Electronic Devices.	CO1	7 Marks
	b)	Explain the operation of Gunn diode in oscillation mode.	CO2	7 Marks
		(OR)		
6.	a)	Draw the characteristics of TRAPATT diode and show how it exhibits negative resistance.	CO2	7 Marks
	b)	Write a short notes on BARITT diode.	CO1	7 Marks

UNIT-IV

7.	a)	Describe briefly about each block of microwave bench.	CO1	7 Marks
	b)	Two identical directional are used in a wave guide to sample the incident and reflected powers. The output of the two couplers if founded to be 2.5mw and 0.15mw. Find the values of VSWR in the wave guide.	CO4	7 Marks
		(OR)		
8.	a)	Explain about measurement of Q of the cavity.	CO1	7 Marks
	b)	Draw the microwave bench setup for measurement of low VSWR and explain its operation.	CO3	7 Marks

UNIT-V

9.	a)	Write a short notes on: i) MUF ii) skip distance and give relation between MUF and skip distance assuming earth is flat.	CO1	7 Marks
	b)	Describe about various types of fading occurs in radio wave propagation.	CO1	7 Marks
		(OR)		
10.	a)	What are the various modes of wave propagation and explain dround wave propagation.	CO1	7 Marks
	b)	Explain about multihop propagation.	CO1	7 Marks

CODE No.: 16BT70406 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

SATELLITE COMMUNICATIONS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss the factors which determine the choice of orbit for communication satellite.	CO1	5 Marks
	b)	Show that the height of Geo-synchronous orbit is about 36,000 Kms.	CO2	5 Marks
	c)	Find the coverage area of a satellite from which it is visible at a minimum elevation angle of 10^0 for the Geo-synchronous orbit.	CO3	4 Marks
		(OR)		
2.	a)	Explain the various reasons for preferring satellite than optical fibers which are providing very high band width.	CO2	8 Marks
	b)	A geosynchronous satellite moving in an equatorial circular orbit at a height of 35000 Km above the surface of the Earth gets inclined at an angle of 2^0. Calculate the maximum deviation in latitude and also maximum deviation in longitude. Determine the maximum displacements in Km caused by latitude and longitude displacements.	CO3	6 Marks

UNIT-II

3.	a)	Discuss the principle of N-S control of a spinner satellite using infrared sensor with a neat figure.	CO1	7 Marks
	b)	Discuss about the G/T Ratio for earth station.	CO2	7 Marks
		(OR)		
4.	a)	Write short notes on Equipment reliability and Space qualification.	CO5	7 Marks
	b)	Derive the power received from the satellite at the earth station from the basic transmission theory.	CO4	7 Marks

UNIT-III

5.	a)	Explain the Tracking, telemetry and Command sub system of a spacecraft.	CO1	8 Marks
	b)	Calculate the frame efficiency of TDMA frame of period 2.2 ms. Total frame: Length = 128000 symbols Guard interval = 110 symbols No. of Traffic bursts\ frame =14 No. of Reference burst\frame = 1 CDC during reference burst = 10 symbols No. of Preamble =208 symbols	CO4	6 Marks
		(OR)		
6.	a)	"Horn antennas are commonly used as primary radiators in reflector systems", Justify?	CO4	7 Marks
	b)	Discuss various modulation and multiplexing techniques used with satellite links.	CO3	7 Marks

UNIT-IV

7.	a)	What are the various NGSO constellation designs? Explain any two.	CO2	7 Marks
	b)	Explain satellite based store-and-forward messages.	CO4	7 Marks

(OR)

8.	a)	How the non-geo proposals are categorized?	CO2	7 Marks
	b)	Compare GEO and MEO satellites.	CO4	7 Marks

UNIT-V

9.	a)	Explain the generation of GPS signals with a neat sketch.	CO4	7 Marks
	b)	Compare GPS and differential GPS.	CO6	7 Marks

(OR)

10.	a)	Explain the signal processing techniques used in GPS receiver.	CO3	7 Marks
	b)	What are the successful measurements in a GPS C/A code receiver?	CO5	7 Marks

CODE No.: 16BT70407 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

WIRELESS COMMUNICATION AND NETWORKS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Explain TDMA and FDMA. Compare them on the basis of their advantages.	CO1	7 Marks
	b)	Draw the architecture of ISDN and explain its working.	CO6	7 Marks
		(OR)		
2.	a)	With a neat diagram, discuss various spread spectrum multiple access techniques.	CO6	7 Marks
	b)	Explain various types of traffic routing in wireless networks and compare them.	CO	7 Marks
		UNIT-II		
3.	a)	In a typical Mobile IP implementation in a home agent, the agent maintains a mobility binding table to map a mobile node's home address to its care-of address for packet forwarding. What entries are essential for each row of the table?	CO5	6 Marks
	b)	What is tunneling? Discuss the features of Mobile IP.	CO2	8 Marks
		(OR)		
4.	a)	Discuss in detail Mobile IP discovery process and ICMP. Also describe the relationship between the two while in operation.	CO4	7 Marks
	b)	Write short notes on the functional areas supported by WML.	CO1	7 Marks
		UNIT-III		
5.	a)	What are the Physical and MAC layer differences in Wi-Fi and WiMAX systems?	CO1	8 Marks
	b)	Draw flow chart on the MAC layer operation in 802.11 standards.	CO3	6 Marks
		(OR)		
6.	a)	What are the requirements of a WLAN? Discuss with an example Infrared LANs.	CO2	8 Marks
	b)	Discuss various WLAN topologies.	CO3	6 Marks
		UNIT-IV		
7.	a)	Write notes on Bluetooth and 802.15 standards.	CO6	8 Marks
	b)	Discuss L2CAP protocol describing the packet formats.	CO6	6 Marks
		(OR)		
8.	a)	Discuss in detail error correction schemes used in Bluetooth.	CO5	7 Marks
	b)	Discuss Bluetooth base band logical channels.	CO1	7 Marks
		UNIT-V		
9.	a)	How many classes of QoS are supported by GPRS and what are the differences between them?	CO2	7 Marks
	b)	What is the difference between full-duplex and half-duplex CDPD operations?	CO1	7 Marks
		(OR)		
10.	a)	Compare and contrast HIPERLAN-1 and HIPERLAN-2.	CO5	7 Marks
	b)	What is the difference between logical and transport channels in HIPERLAN-2.	CO1	7 Marks

CODE No.: 16BT70408 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

LOW POWER CMOS VLSI DESIGN
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What are the different types of power dissipation in CMOS circuit? Derive the expression for power dissipation in CMOS circuit.	CO1	7 Marks
	b)	Explain the variation of total output current in CMOS inverter under varying output capacitance.	CO1	7 Marks
		(OR)		
2.	a)	Explain two major sources of leakage current in MOS transistos.	CO1	7 Marks
	b)	Explain the basic principles of low power design.	CO1	7 Marks

UNIT-II

3.	a)	Explain about power model based on component operations.	CO2	7 Marks
	b)	Explain in detail about gate level power analysis.	CO2	7 Marks
		(OR)		
4.	a)	Explain the following. i) Sample correlation. ii) Negative correlation. iii) Uniform white noise region.	CO2	7 Marks
	b)	Explain in detail Monte carlo power simulation procedure.	CO2	7 Marks

UNIT-III

5.	a)	Explain in detail about driving high capacitance load using inverter cascade.	CO3	7 Marks
	b)	Write the mapping steps for mapping a Boolean function to a complex transistor network.	CO3	7 Marks
		(OR)		
6.	a)	With examples, explain the basic transformation operators.	CO3	7 Marks
	b)	Draw various logic implementations of signal gating.	CO3	7 Marks

UNIT-IV

7.	a)	Draw charge sharing circuit for half-swing clock.	CO4	7 Marks
	b)	Explain in detail about various clock power reduction techniques.	CO4	7 Marks
		(OR)		
8.	a)	Explain in detail about CMOS floating node and Tristate keeper circuit.	CO4	7 Marks
	b)	Explain in detail about low swing bus circuit techniques.	CO4	7 Marks

UNIT-V

9.	a)	Explain in detail about different performance management techniques.	CO5	7 Marks
	b)	Explain how to reduce power dissipation using switching activity reduction.	CO5	7 Marks
		(OR)		
10.	a)	Derive the expression for power dissipation of a pipelined system.	CO5	7 Marks
	b)	Explain in detail about operator transformation with an example.	CO5	7 Marks

CODE No.: 16BT70409 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January – 2022

RF ENGINEERING
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the high frequency behaviour of a capacitor with equivalent circuit.	CO3	7 Marks
	b)	Draw and describe thin film resistor impedance as a function of frequency.	CO3	7 Marks
		OR)		
2.	a)	Write a short note on chip capacitors.	CO3	7 Marks
	b)	Compute the skin depths for Copper (σ_{Cu}= 64.516 x 10^6s/m), Aluminium(σ_{Al} = 40 x 10^6s/m) and Gold (σ_{Au}= 48.54 x 10^6s/m) at 1GHz and 10GHz.	CO3	7 Marks

UNIT-II

3.	a)	What is a quarter wave transformer and how to match the impedance using it?	CO2	7 Marks
	b)	Derive the relationship between VSWR and S_{11}.	CO2	7 Marks
		(OR)		
4.	a)	Derive the expression for characteristic impedance, Z_0 of a transmission line.	CO2	7 Marks
	b)	What is a lossless line and derive the expression for its characteristic impedance?	CO2	7 Marks

UNIT-III

5.	a)	Explain any of the two discrete component matching methods.	CO3	7 Marks
	b)	What is a tunable filter and how to design it?	CO4	7 Marks
		(OR)		
6.	a)	Draw and describe the construction and operation of varactor diode.	CO3	7 Marks
	b)	Describe the operation of FET intended for RF applications.	CO3	7 Marks

UNIT-IV

7.	a)	Distinguish between incident power, input power and available power.	CO4	7 Marks
	b)	Draw and explain stabilization techniques for input and output ports.	CO4	7 Marks
		(OR)		
8.	a)	What are the design principles of a broadband amplifier?	CO5	7 Marks
	b)	Draw and explain the operation of VGA amplifier.	CO5	7 Marks

UNIT-V

9.	a)	Draw and explain the principle of operation of feedback oscillator.	CO4	7 Marks
	b)	Draw and explain the operation of VCO.	CO4	7 Marks
		(OR)		
10.	a)	Write a short note on direct digital synthesizer.	CO5	7 Marks
	b)	Discuss frequency domain considerations of RF mixers.	CO5	7 Marks

CODE No.: 16BT70410 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

SPEECH PROCESSING
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Explain the unique properties of speech compared to other real time signals.	CO4	7 Marks
	b)	What is the vowel triangle? What functions do F_0 variations have in speech communication?	CO4	7 Marks
		(OR)		
2.	a)	Give the boundary conditions for lossless tube model of speech production and device its transfer function.	CO5	7 Marks
	b)	Distinguish between semi-vowels and vowels from the articulatory point of view.	CO4	7 Marks
		UNIT-II		
3.	a)	What are the advantages of time domain methods of speech processing over frequency domain methods?	CO1	7 Marks
	b)	How the short time energy is computed? What is its significance?	CO1	7 Marks
		(OR)		
4.	a)	Give a brief note about time domain methods of silence detection in speech signal.	CO3	7 Marks
	b)	Find the long-time autocorrelation function $\rho(k)$, for given signal x(n) and sketch the $\rho(k)$ as a function of k. $x(n)= A \cos(\omega_o n)$	CO	7 Marks
		UNIT-III		
5.	a)	Describe about homomorphic systems used in speech signal processing.	CO5	7 Marks
	b)	Short notes homomorphic vocoder.	CO2	7 Marks
		(OR)		
6.	a)	Explain properties of the complex cepstrum.	CO1	7 Marks
	b)	Explain formant estimation from cepstrally smoothed log spectra method.	CO5	7 Marks
		UNIT-IV		
7.		Derive the expression for gain from the prediction error .of linear prediction.	CO2	14 Marks
		(OR)		
8.	a)	Explain the pitch detection using LPC parameters.	CO2	7 Marks
	b)	Compare methods of solution of LPC analysis equation.	CO2	7 Marks
		UNIT-V		
9.	a)	Draw the block diagram of a speaker verification system and explain in detail.	CO6	7 Marks
	b)	Distinguish between speaker verification and speaker identification.	CO6	7 Marks
		(OR)		
10.		Explain the Isolated digit recognition system operation with neat block diagram.	CO6	14 Marks

CODE No.: 16BT70505 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January – 2022

HUMAN COMPUTER INTERACTION

[Computer Science and Engineering, Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What is a user interface? Why it is so important in designing an application?	CO1	8 Marks
	b)	Compare and contrast the characteristics of Graphical user interface with Web user interface design.	CO3	6 Marks
		(OR)		
2.	a)	Illustrate the concept of direct manipulation in graphical systems.	CO1	8 Marks
	b)	Briefly describe the principles of user interface design.	CO1	6 Marks

UNIT-II

3.	a)	Briefly describe about advantages and disadvantages of graphical user interface. Explain the design goals in creating a user interface.	CO2	8 Marks
	b)	List and explain the important human characteristics that have an influence on interface design.	CO3	6 Marks
		(OR)		
4.	a)	Illustrate the goals of Interface design.	CO2	8 Marks
	b)	Discuss briefly about technological considerations in interface design.	CO3	6 Marks

UNIT-III

5.	a)	Explain about ordering and organizing of screen elements.	CO3	6 Marks
	b)	List and briefly explain any four screen based controls.	CO3	8 Marks
		(OR)		
6.	a)	List and discuss the qualities that provide visually pleasing composition for screen.	CO3	6 Marks
	b)	What is the importance of designing Menus in user interface? Explain about various design principles for single and multiple Menus.	CO3	8 Marks

UNIT-IV

7.	a)	State different types of windows and explain any four.	CO4	6 Marks
	b)	Describe all the guidelines to be considered for choosing the colors for an Icon.	CO4	8 Marks
		(OR)		
8.	a)	Explain various window operations.	CO4	6 Marks
	b)	Discuss the general guide lines of organizing and laying out components on window.	CO4	8 Marks

UNIT-V

9.	a)	Explain the role of user interface architects in building software tools. Also discuss about the specification methods of software tools.	CO5	8 Marks
	b)	When should the speech generation is preferable. Explain in detail.	CO5	6 Marks
		(OR)		
10.	a)	Explain any three pointing devices.	CO5	6 Marks
	b)	Describe about discrete word recognition and continuous speech recognition in detail.	CO5	8 Marks

CODE No.: 16BT71001 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

ANALYTICAL INSTRUMENTATION
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Describe the working of pH meter with a neat sketch.	CO1	6 Marks
	b)	Explain magnetic wind oxygen analyzer with a neat sketch.	CO1	8 Marks
		(OR)		
2.	a)	Compare sodium analyzer with silica analyzer.	CO2	7 Marks
	b)	Explain the construction and working of conductivity meter.	CO1	7 Marks

UNIT-II

3.	a)	Explain the working of single beam and double beam null type UV-Visible Spectrophotometers with neat diagrams.	CO1	8 Marks
	b)	What is a spectrophotometer? Explain in detail about the construction and working principle of Fourier Transform IR Spectrometer.	CO1	6 Marks
		(OR)		
4.	a)	Outline the principles of visible spectroscopy and detailed comparison of various detecting units.	CO2	7 Marks
	b)	Elucidate the working of any one type of IR spectrometer and mention how the chemical solution is analyzed.	CO4	7 Marks

UNIT-III

5.	a)	Specify the significance of flame photometer in analysis of chemical solutions and explain the working of clinical flame photometer.	CO5	7 Marks
	b)	What is meant by Nuclear Magnetic Resonance? Explain the construction and working principle of NMR Spectrometer.	CO1	7 Marks
		(OR)		
6.	a)	Describe the working principle of atomic absorption spectrometer with relevant application.	CO1	7 Marks
	b)	Identify and explain the importance of time of flight mass spectrometers in medical applications.	CO3	7 Marks

UNIT-IV

7.	a)	List the different detectors used in liquid chromatography. Explain any one.	CO1	7 Marks
	b)	Explain the working principle of liquid chromatography with a neat sketch.	CO1	7 Marks
		(OR)		
8.	a)	Discuss the construction and working principle of gas chromatography and explain the role in chemical compound analysis.	CO5	7 Marks
	b)	Explain about Photo ionization detector and Flame ionization detector.	CO1	7 Marks

UNIT-V

9.	a)	Explain how Sulphur dioxide is measured in environment and discuss its pollution issues in environment.	CO6	6 Marks
	b)	With necessary diagrams explain the Proportional Counter and Ionization chamber.	CO1	8 Marks

(OR)

10.	a)	Explain the working of X-ray detectors.	CO1	8 Marks
	b)	Write short notes on GM counter and give its applications.	CO1	6 Marks

CODE No.: 16BT71002 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

BIOMEDICAL SIGNAL PROCESSING
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	With a neat diagram, explain the computer aided diagnosis and therapy based upon biomedical signal analysis	CO1	14 Marks
	(OR)		
2.	Explain the following biomedical signals. Draw the waveforms and frequency ranges relevant to these signals. i) ECG. ii) EEG.	CO1	14 Marks

UNIT-II

3.	Identify three potential sources of physiological artifacts in recording the EEG signal. Explain how derivative based operators to remove low-frequency artifacts	CO2	14 Marks
	(OR)		
4.	Under what conditions synchronised averaging fail to reduce noise? Write a detailed note on frequency domain filters to remove low frequency noise and removal of periodic artifacts	CO2	14 Marks

UNIT-III

5.	Write a brief note on Adaptive Canceler. Design an adaptive filter using LMS algorithm.	CO3	14 Marks
	(OR)		
6.	What is the difference between static filters and adaptive filters? Explain how phase sensitive detectors used in biomedical signal analysis.	CO3	14 Marks

UNIT-IV

7.	Explain various methods used for QRS detection in ECG signals.	CO4	14 Marks
	(OR)		
8.	Explain the various data reduction techniques used in biomedical signal analysis.	CO5	14 Marks

UNIT-V

9.	Explain why the periodogram is not a consistent estimate of the power spectral density. Explain the use of windows in the estimation of power spectral density.	CO5	14 Marks
	(OR)		
10.	Write a short note on: i) Welch method for power spectral density. ii) Measures derived from power spectral density functions.	CO6	14 Marks

CODE No.: 16BT71003 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

INDUSTRIAL AUTOMATION
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Classify The PLC. What are the differences between PLC and Computer? Explain.	CO1	8 Marks
	b)	Describe in detail about PLC I/O Modules.	CO2	6 Marks
		(OR)		
2.	a)	Describe the basic sequence of operation in a PLC.	CO2	8 Marks
	b)	Explain the bidirectional opto-isolator.	CO2	6 Marks

UNIT-II

3.	a)	Write a note of instruction sets of PLC ladder programming.	CO3	7 Marks
	b)	Explain the PLC comparison functions using switches and contact relays with a suitable example.	CO2	7 Marks
		(OR)		
4.	a)	Explain the PLC athematic functions using switches and contact relays with a suitable example.	CO2	9 Marks
	b)	Explain in detail od PID functions with diagram.	CO1	5 Marks

UNIT-III

5.	a)	What are the advantages of distributed control systems over centralized computer control of processes? How to program a DCS?	CO5	6 Marks
	b)	Explain in detail about Local Control Unit (LCU).	CO2	8 Marks
		(OR)		
6.	a)	List and explain advanced function blocks in the DCS system.	CO2	6 Marks
	b)	Discuss the need for automation in process industries.	CO3	8 Marks

UNIT-IV

7.	a)	Explain the different elements of SCADA in detail.	CO1	6 Marks
	b)	What is the role of master terminal unit in supervisory control system?	CO2	8 Marks
		(OR)		
8.	a)	Explain the selection procedure of SCADA system for industrial automation.	CO4	8 Marks
	b)	Explain, how to control analog parameters in by RTU in SCADA system.	CO5	6 Marks

UNIT-V

9.	a)	Explain communication modes of HART.	CO6	8 Marks
	b)	With neat sketch, explain the different ways in which devices are connected to the field bus.	CO3	6 Marks
		(OR)		
10.	a)	List different HART commands. Explain the operation of field bus with a neat diagram.	CO4	6 Marks
	b)	List and compare OSI layers used in HART protocol.	CO6	8 Marks

CODE No.: 16BT71006 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

INDUSTRIAL ELECTRONICS

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Mention the principle of operation of SCR and explain its static characteristics with neat sketch.	CO1	7 Marks
	b)	Mention SCR communication techniques and differentiate.	CO1	7 Marks
		OR)		
2.	a)	Analyze two transistor model of SCR by deriving the total current in SCR.	CO2	7 Marks
	b)	Explain with necessary derivations how we can protect SCR from high voltages.	CO3	7 Marks

UNIT-II

3.	a)	Derive the load current for full wave control rectifier and explain its working in detail.	CO2	7 Marks
	b)	Discuss about chopper circuit configurations.	CO1	7 Marks
		(OR)		
4.	a)	Explain the operation and construction of cycloconverters in detail.	CO1	7 Marks
	b)	Describe the working of a single-phase half bridge inverter what it its main draw back. Explain how this drawback is overcome.	CO2	7 Marks

UNIT-III

5.	a)	Classify electronic timers, mention the role of digital timers in industries and mention its applications.	CO3	7 Marks
	b)	List out different types of resistance welding and explain in detail about any two of them.	CO2	7 Marks
		(OR)		
6.	a)	Explain the principle of operations and applications of high frequency heating and dielectric heating.	CO1	7 Marks
	b)	Discuss about Ultrasonic flaw detection and mention its applications.	CO1	7 Marks

UNIT-IV

7.	a)	Classify IC voltage regulators and explain about adjustable regulator.	CO4	7 Marks
	b)	Analyze the operation of series regulator with neat sketch.	CO2	7 Marks
		(OR)		
8.	a)	Explain with a neat sketch, how you can protect the 723 general purpose regulator from over current condition.	CO4	7 Marks
	b)	Illustrate the technique used in switching regulators and explain its working in detail.	CO3	7 Marks

UNIT-V

9.	a)	Discuss the basic concepts of numerical control and how these control the stepper motor and DC motor operations.	CO1	7 Marks
	b)	Explain data processing unit characteristics of CNC/DNC system in detail and compare it with N/C system.	CO2	7 Marks
		(OR)		
10.	a)	Explain the CNC typical system in detail.	CO1	7 Marks
	b)	Using appropriate technique explain the concept of CNC interfacing with machines.	CO2	7 Marks

CODE No.: 16BT71009 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

POWER PLANT INSTRUMENTATION
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	With neat diagram explain the operation of solar power plant and mention the important parameters to be monitored in each block.	CO1	7 Marks
	b)	Briefly explain the importance of instrumentation in power generation.	CO2	7 Marks
		(OR)		
2.	a)	With neat diagram, explain the operation of wind power plant and mention the important parameters to be monitored in each block.	CO1	7 Marks
	b)	What is meant by cogeneration and also explain the topping and bottoming cycle operation of cogeneration systems?	CO2	7 Marks

UNIT-II

3.	a)	Explain in detail about the Drum level measurement with neat sketch.	CO3	7 Marks
	b)	Explain briefly about Dust measurement with clear diagram.	CO1	7 Marks
		(OR)		
4.	a)	Explain in detail about any three types of steam Temperature measurement.	CO4	7 Marks
	b)	Explain briefly about Smoke measurement with clear diagram.	CO2	7 Marks

UNIT-III

5.	a)	What is the need of connecting thermocouples in series and parallel during temperature measurement?	CO4	7 Marks
	b)	Why float type level measurement is not suitable for boiler drum level measurement?	CO2	7 Marks
		(OR)		
6.	a)	Explain about combustion control mechanisms.	CO5	7 Marks
	b)	Elaborate the furnace draft control in air fuel circuit.	CO3	7 Marks

UNIT-IV

7.	a)	Classify Instrumentation systems for vibrating monitoring.	CO3	7 Marks
	b)	Explain in detail about the Vibration monitoring and control.	CO4	7 Marks
		(OR)		
8.	a)	What are the monitoring parameters in vibration measurement?	CO4	7 Marks
	b)	Explain in detail about the Lubricant oil control for Pressure, flow and temperature.	CO3	7 Marks

UNIT-V

9.	a)	Elaborate the electrical safety and maintenance of electrical system.	CO6	7 Marks
	b)	Write short notes on explosion hazards and intrinsic safety.	CO1	7 Marks
		(OR)		
10.		Explain in detail about interlocks for boiler operation.	CO1	14 Marks

CODE No.: 16BT71201 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

BIG DATA TECHNOLOGIES
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain Apache Hadoop and the Hadoop ecosystems.	CO1	7 Marks
	b)	Compare Hadoop with other systems.	CO1	7 Marks
		(OR)		
2.	a)	Explain file based data structures and Serialization.	CO2	7 Marks
	b)	Construct Architecture of Hadoop and explain each component in detail.	CO2	7 Marks

UNIT-II

3.	a)	Examine the process of Map reduce with an example.	CO4	7 Marks
	b)	Use Hive to perform a word count with an example.	CO4	7 Marks
		(OR)		
4.	a)	Explain about Hadoop streaming.	CO3	7 Marks
	b)	Explain map reduce types, input and output formats.	CO3	7 Marks

UNIT-III

5.	a)	Explain all user defined functions of Hive.	CO4	7 Marks
	b)	Compare Hbase and RDBMS.	CO4	7 Marks
		(OR)		
6.	a)	Explain Pig user defined functions.	CO5	7 Marks
	b)	Explain Pig data processing operation in detail.	CO1	7 Marks

UNIT-IV

7.	a)	Compare and contrast Pig, Hive, and HBase. List strengths and weaknesses of each tool set. Research and summarize three published use cases for each tool set.	CO4	7 Marks
	b)	Explain about Zookeeper service in detail.	CO4	7 Marks
		(OR)		
8.	a)	Explain the process of building application with Zookeeper.	CO4	7 Marks
	b)	Explain how Database exports are done in Sqoop and exports done in Sqoop.	CO4	7 Marks

UNIT-V

9.		Elaborate procedure for creating Face book Database in Hive environment.	CO5	14 Marks
		(OR)		
10.		Elaborate the procedure for importing and exporting database with an example.	CO5	14 Marks

CODE No.: 16BT71202 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

MOBILE APPLICATION DEVELOPMENT
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Write a short note on the benefits of creating a Mobile App.	CO1	6 Marks
	b)	List the features of Android and how can screen real estate be effectively used.	CO1	8 Marks
		(OR)		
2.	a)	Discuss in detail about content and controls in the Mobile information design with neat sketch.	CO1	8 Marks
	b)	What is Android? Briefly discuss about the history of android versions.	CO1	6 Marks

UNIT-II

3.	a)	Illustrate the Lifecycle of an activity with a neat diagram.	CO1	7 Marks
	b)	Analyze how to persist state information during changes in configuration.	CO2	7 Marks
		(OR)		
4.	a)	Discuss in detail about Adding Action items to the Action Bar.	CO4	9 Marks
	b)	Create an Android app to programmatically hide or display the Action Bar.	CO5	5 Marks

UNIT-III

5.	a)	Create an android app that illustrates the importance of AutoCompleteTextView.	CO5	8 Marks
	b)	Develop an android app which can choose a Date from a Dialog Pop-Up.	CO6	6 Marks
		(OR)		
6.	a)	Create an Android app to Add Images to Buttons and display an image by clicking that particular button.	CO4	9 Marks
	b)	Distinguish different ways to save and load of user preferences.	CO2	5 Marks

UNIT-IV

7.	a)	Discuss in detail about the two ways to send **sms** messages in the android application.	CO1	7 Marks
	b)	Develop an android app to download plain text content from a server and display it in the app.	CO2	7 Marks
		(OR)		
8.	a)	Develop an android application to send an email.	CO6	7 Marks
	b)	Explain in detail how to monitor SVEC location such that if the user is within a ten meter radius from that location, app has to fire intent to launch the web browser.	CO3	7 Marks

UNIT-V

9.	a)	Define Service and write an alarm clock service (prescheduled time has been reached, has to sound) that run persistently in the background.	CO6	8 Marks
	b)	Briefly describe the anatomy of an **ios** app.	CO1	6 Marks
		(OR)		
10.	a)	Define Service and discuss how to start and stop a service.	CO1	8 Marks
	b)	Write short notes on Debugging **ios** Apps.	CO1	6 Marks

CODE No.: 16BT71203 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January – 2022

INFORMATION RETRIEVAL SYSTEMS
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Define Information Retrieval System. Explain Objectives of Information Retrieval Systems.	CO1	7 Marks
	b)	Outline the functional overview of Information Retrieval System.	CO1	7 Marks
		(OR)		
2.	a)	Differentiate fuzzy searches and term masking.	CO1	7 Marks
	b)	Explain how Search and browse capabilities are crucial to assist the user in locating relevant items.	CO2	7 Marks
		UNIT-II		
3.	a)	Demonstrate the Stemming Process and describe the dictionary look-up stemmers.	CO3	10 Marks
	b)	What is meant by entity processing? Explain in detail.	CO3	4 Marks
		(OR)		
4.	a)	Discuss Automatic Indexing and User Search techniques.	CO1	6 Marks
	b)	Define vector weighting and discuss any two algorithms of vector weighting.	CO2	8 Marks
		UNIT-III		
5.	a)	Define term clustering. Describe various types of automatic term clustering techniques.	CO4	8 Marks
	b)	Why are there three levels of binding in the creation of a search?	CO2	6 Marks
		(OR)		
6.	a)	Discuss Weighted Searches of Boolean Systems for User Search Techniques.	CO1	8 Marks
	b)	What are some potential ambiguities in use of relevance feedback on hypertext documents?	CO2	6 Marks
		UNIT-IV		
7.	a)	Explain various information visualization techniques.	CO1	9 Marks
	b)	What is meant by display of the item in information presentation.	CO1	5 Marks
		(OR)		
8.	a)	Describe multimedia information retrieval.	CO5	8 Marks
	b)	Exemplify about TREC results.	CO5	6 Marks
		UNIT-V		
9.		Explain Software Text Search algorithms Hardware Text Search Systems.	CO5	14 Marks
		(OR)		
10.	a)	Give introduction to Information System Evaluation.	CO1	5 Marks
	b)	Discuss measures used in System Evaluations.	CO4	9 Marks

CODE No.: 16BT71205 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

CRYPTOGRAPHY AND NETWORK SECURITY
[Computer Science and Engineering, Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Differentiate threat and attack. What are the different types of attacks?	CO2	7 Marks
	b)	Generate the cipher text for the message "CRYPTOGRAPHY" using ceaser cipher with the key as 5.	CO4	7 Marks
		(OR)		
2.	a)	Briefly discuss about a model for network security.	CO1	7 Marks
	b)	What is a transposition cipher? Explain the rail fence technique with an example.	CO4	7 Marks

UNIT-II

3.	a)	State and explain the principles of public key cryptography.	CO1	7 Marks
	b)	List the improvements of Oakley compared to Diffie-Hellman algorithm.	CO1	7 Marks
		(OR)		
4.	a)	Discuss about the following block cipher modes of operation. i) Cipher feedback mode. ii) Output feedback mode.	CO3	6 Marks
	b)	Explain the working of RSA algorithm with an example.	CO3	8 Marks

UNIT-III

5.	a)	Describe HMAC algorithm in detail.	CO1	7 Marks
	b)	Explain the classification of message authentication function in detail.	CO1	7 Marks
		(OR)		
6.	a)	What are the various approaches to producing message authentication?	CO3	7 Marks
	b)	Identify the role of digital signature in e-commerce.	CO4	7 Marks

UNIT-IV

7.	a)	Differentiate between transport and tunneling modes.	CO6	7 Marks
	b)	What is the role of security association in IP Security? List the parameters used to identify the security association.	CO6	7 Marks
		(OR)		
8.	a)	Explain about S/MIME in detail.	CO5	7 Marks
	b)	Write about transport layer security.	CO6	7 Marks

UNIT-V

9.	a)	Explain detail the password selection strategies.	CO5	7 Marks
	b)	Write a short note on intrusion detection.	CO1	7 Marks
		(OR)		
10.	a)	Write a short notes on "Firewalls".	CO5	7 Marks
	b)	Write a short notes on "Viruses".	CO5	7 Marks

CODE No.: 16BT71501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

SYSTEM MODELING AND SIMULATION
[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain various components and organization of discrete event simulation model.	CO1	6 Marks
	b)	What are the simulation diagrams? Explain them with neat sketches.	CO1	8 Marks
		(OR)		
2.		Explain about discrete event simulation in detail.	CO1	14 Marks

UNIT-II

3.	a)	Explain about basic math functions and variables of R with examples.	CO2	7 Marks
	b)	Justify the "R functions are first-class objects".	CO2	7 Marks
		(OR)		
4.	a)	Write R code to implement Binary Search Tree.	CO2	7 Marks
	b)	Write R function to check whether the given number is prime or not.	CO2	7 Marks

UNIT-III

5.	a)	Explain the various probability terminologies and concepts.	CO2	7 Marks
	b)	Explain the following continuous distribution. i) Uniform distribution. ii) Exponential distribution.	CO1	7 Marks
		(OR)		
6.		A company uses 6 trucks to haul manganese are from Kolar to industry. There are two loaders, to load each truck. After loading, a truck moves to the weighing scale to be weighed. The queue discipline is FIFO. When it is weighed, a truck travels to the industry and returns to the loader queue. The distribution of loading time, weighing time and travel time are as follows:	CO4	14 Marks

Loading time	10	5	5	10	15	10	10
Weigh time	12	12	12	16	12	16	
Travel time	60	100	40	40	80		

Calculate the total busy time of loaders, the scale, average loader and scale utilization.
Assume 5 trucks are at the loader and one is at the scale, at time "0". Stopping event time TE = 64min.

UNIT-IV

7.	a)	List and explain different queuing notations.	CO2	7 Marks
	b)	A production process manufactures computer chips on the average at a 2% non conforming. Every day, a random sample of size 50 is taken from the process. If the sample contains more than two non conforming chips, the process will be stopped. Compute the probability that the process is stopped by the sampling scheme.	CO3	7 Marks
		(OR)		

8.	a)	Compare different techniques used for generating random numbers with examples.	CO4	8 Marks
	b)	What are Pseudo random numbers? What are the problems that occur while generating Pseudo random number?	CO1	6 Marks

UNIT-V

9.	a)	With a neat diagram, explain the concept of model building, verification and validation.	CO6	7 Marks
	b)	Describe the three step approach formulated by Naylor and Finger in the validation process.	CO6	7 Marks

(OR)

10.	a)	Explain the replication method for steady state simulations.	CO6	7 Marks
	b)	Differentiate between terminating and steady state simulations by giving one example each.	CO6	7 Marks

CODE No.: 16BT71502 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January – 2022

SYSTEMS ENGINEERING
[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Illustrate the functioning of system Engineer career development Model.	CO1	7 Marks
	b)	Explain various system engineering domain and fields.	CO1	7 Marks
		(OR)		
2.	a)	Discuss about career opportunities and growth in System Engineer profession.	CO3	7 Marks
	b)	Discuss about various system engineering approaches.	CO1	7 Marks

UNIT-II

3.	a)	Explain about functional elements of system building blocks.	CO2	7 Marks
	b)	Illustrate the life cycle model of DoD.	CO3	7 Marks
		(OR)		
4.	a)	Explain the automobile system boundaries by showing context diagram.	CO2	7 Marks
	b)	Discuss on role of testing throughout system development.	CO2	7 Marks

UNIT-III

5.	a)	Analyze and explain projected system needs by showing flow diagram.	CO3	7 Marks
	b)	Explain about requirements analysis in the concept definition phase.	CO3	7 Marks
		(OR)		
6.	a)	What is feasibility? Explain Visualization of Subsystem Implementation.	CO3	7 Marks
	b)	Design and explain functional block diagram of a standard coffeemaker using IDEF method.	CO3	7 Marks

UNIT-IV

7.	a)	How do analyze and evaluate test results and user interfaces? Discuss.	CO4	7 Marks
	b)	Write a short note on: i) Modular Configuration. ii) User Interface Design.	CO4	7 Marks
		(OR)		
8.	a)	Discuss about prototype development as a risk mitigation technique.	CO5	7 Marks
	b)	Explain systems engineering method in engineering design.	CO4	7 Marks

UNIT-V

9.	a)	Describe the application of concurrent engineering in successive phases of system development.	CO6	10 Marks
	b)	Explain about operational factors in system development.	CO5	4 Marks
		(OR)		
10.	a)	Illustrate the Problems in the Transition Process.	CO5	10 Marks
	b)	Write a short note on: i) WBS. ii) SEMP.	CO6	4 Marks

CODE No.: 16BT71503 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

DATA ANALYTICS
[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss the data processing chain with neat sketch.	CO1	7 Marks
	b)	Explain various applications of data analytics.	CO1	7 Marks
		(OR)		
2.	a)	"Data almost certainly needs to be cleansed and transformed before it can be used for data mining". Justify.	CO1	7 Marks
	b)	How would you judge the quality of data visualizations?	CO1	7 Marks

UNIT-II

3.	a)	What is a decision tree? Why decision trees are the most popular classification technique?	CO2	7 Marks
	b)	Compare and contrast decision trees with regression models.	CO2	7 Marks
		(OR)		
4.	a)	Explain the steps required to build an ANN.	CO2	7 Marks
	b)	Explain the key elements that differed in the construction of Decision Tree algorithms.	CO2	7 Marks

UNIT-III

5.	a)	Explain Apriori algorithm for association rule mining.	CO3	7 Marks
	b)	Discuss advantages and disadvantages of K-Means algorithm.	CO3	7 Marks
		(OR)		
6.	a)	Define Baye's theorem. Explain Naïve Baye's model for classification.	CO3	7 Marks
	b)	Discuss briefly text classification.	CO3	7 Marks

UNIT-IV

7.	a)	Explain in detail about Big Data Landscape.	CO4	7 Marks
	b)	Explain briefly about descriptive statistics.	CO4	7 Marks
		(OR)		
8.	a)	Discuss the use of normal distribution with respect to data analysis.	CO4	7 Marks
	b)	Explain page rank algorithm.	CO4	7 Marks

UNIT-V

9.	a)	Discuss Hadoop distributed file system.	CO5	7 Marks
	b)	How does Map Reduce work? Explain with an example.	CO5	7 Marks
		(OR)		
10.		Discuss the following in MongoDB Query language. i) MapReduce functions. ii) Cursors. iii) Import and Export.	CO6	14 Marks

CODE No.: 16BT71508 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations January - 2022

INTERNET OF THINGS

[Computer Science and Engineering, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What are the IoT protocols in Application layer? Discuss in detail.	CO1	7 Marks
	b)	Explain about logical design of IOT device.	CO1	7 Marks
		(OR)		
2.	a)	Describe about Communication models in IOT.	CO2	7 Marks
	b)	With neat diagrams, explain about IoT Levels and Deployment Templates in detail.	CO2	7 Marks

UNIT-II

3.		Explain in detail about various Domain Specific IoT applications.	CO4	14 Marks
		(OR)		
4.	a)	Explain Arduino interfacing with an example.	CO3	7 Marks
	b)	Describe various Linux commands to implement on Raspberry Pi.	CO3	7 Marks

UNIT-III

5.	a)	Define Electronics, Sensors and Actuators used for IOT applications.	CO2	7 Marks
	b)	Write a program to detect an object using IR sensor.	CO2	7 Marks
		(OR)		
6.	a)	Write short notes on: i) Internet Communications. ii) MAC Addresses.	CO3	7 Marks
	b)	Explain the role of UDP and TCP in IOT.	CO3	7 Marks

UNIT-IV

7.		Explain the Seven steps of Design Methodology for IOT System Design.	CO4	14 Marks
		(OR)		
8.	a)	Discuss about Home Automation in detail.	CO4	7 Marks
	b)	What are the various service types? Explain.	CO4	7 Marks

UNIT-V

9.	a)	Describe about data Analytics for IOT in detail.	CO5	7 Marks
	b)	Explain about Hadoop ecosystem in detail.	CO5	7 Marks
		(OR)		
10.	a)	Briefly explain about Hadoop Map Reduce for batch data analysis.	CO5	7 Marks
	b)	Describe about Apache Oozie in detail	CO6	7 Marks

CODE No.: 16BT5HS01 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

MANAGEMENT SCIENCE
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Identify different functions of management and explain each one of them with examples.	CO1	14 Marks

(OR)

2.	a)	What are the advantages of Centralization and Decentralization? Explain.	CO3	6 Marks
	b)	Write the organization structure of your college. What type of structure is that?	CO3	8 Marks

UNIT-II

3.	a)	Explain the basic steps of Method study.	CO1	7 Marks
	b)	Explain briefly the basic principles involved in preparing the layout of any industrial plant indicating the important techniques available for the purpose.	CO2	7 Marks

(OR)

4.	a)	List and explain the steps involved in work-measurement.	CO1	7 Marks
	b)	Enumerate the factors affecting quality and explain how to overcome them.	CO1	7 Marks

UNIT-III

5.	a)	Write the differences between on-job training and off-job training.	CO1	6 Marks
	b)	What is performance appraisal? List the objectives and steps involved in performance appraisal.	CO1	8 Marks

(OR)

6.	a)	Explain the methods of merit rating with examples.	CO1	8 Marks
	b)	Enumerate the assumptions of McGregor's theory of 'X' and 'Y'.	CO1	6 Marks

UNIT-IV

7. A small project is composed of 8 activities whose time estimates are listed in the table below. CO4 14 Marks

Activity	Predecessor	Estimated duration(Weeks)		
		Optimistic	Most likely	Pessimistic
A	-	1	1	7
B		1	4	7
C		2	2	8
D	A	1	1	1
E	B	2	5	14
F	C	2	5	8
G	D,E	3	6	15
H	F,G	1	2	3

i) Draw the project network and determine the expected project completion time.
ii) What duration will have 95% confidence of project completion?

(OR)

8.	a)	Explain the term 'Entrepreneur'. State the characteristics of an entrepreneur.	CO5	6 Marks
	b)	Differentiate between entrepreneur and manager.	CO5	8 Marks

UNIT-V

9.	a)	What is meant by Business Process Outsourcing? Also state its need.	CO6	7 Marks
	b)	Explain the concept of Just-In-Time and state its advantages.	CO6	7 Marks
		(OR)		
10.	a)	Explain the concept of six sigma.	CO6	7 Marks
	b)	Discuss in detail the role of BPO in the area of manufacturing.	CO6	7 Marks

CODE No.: 16BT6HS11 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

PERSONALITY DEVELOPMENT

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Describe in your own words how the unrealistic and vague goals affect your life.	CO1	14 Marks
		(OR)		
2.	a)	Explain why rewards for success or accomplishment are better ways to provide reinforcement than punishment for failure.	CO4	7 Marks
	b)	Explain the objectives of your short term goals with a few examples.	CO4	7 Marks

UNIT-II

3.		Developing positive attitudes and eliminating negative ones is the best kind of reforming you can do – Differentiate.	CO2	14 Marks
		(OR)		
4.	a)	List out three steps in the process of attitude improvement.	CO1	7 Marks
	b)	List out the a few negative consequences for those who have negative attitudes.	CO1	7 Marks

UNIT-III

5.		Apply a few strategies to improve efficient work habits.	CO3	14 Marks
		(OR)		
6.	a)	Stress in your private life influences your work and vice versa. Describe.	CO1	7 Marks
	b)	Mention few ways to develop your thinking skills.	CO1	7 Marks

UNIT-IV

7.		Differentiate between the Laissez-Faire Leader and the Democratic Leadership styles.	CO2	14 Marks
		(OR)		
8.	a)	It is important to find out and apply the preferred communication style of your supervisor. Infer the idea	CO4	7 Marks
	b)	"Your supervisor should be aware of all the problems". Predict the statement	CO4	7 Marks

UNIT-V

9.		Your short and medium range goals will include efforts to secure raises and promotions. Illustrate	CO3	14 Marks
		(OR)		
10.	a)	Up gradation of skills for the requirement of a job is compulsory". Evaluate.	CO5	7 Marks
	b)	"A performance Appraisal is an official evaluation of your work" Justify.	CO5	7 Marks

CODE No.: 16BT50304 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

REFRIGERATION AND AIR CONDITIONING
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	"The COP of an air refrigeration cycle is very low, but still a refrigeration system is most common in the Air craft", discuss the statement.	CO1	6 Marks
	b)	A Bell-Coleman refrigeration cycle works between 1 bar and 6 bar. The adiabatic efficiency of compression is 90% and expansion is 95%. Find the COP of the system and its tonnage when the air flow rate is 2 kg/sec. The ambient temperature is 25ºC and refrigerator temperature is -5ºC.	CO3	8 Marks
		(OR)		
2.	a)	Derive an expression for the COP of Bell- Coleman cycle.	CO1	6 Marks
	b)	The capacity of a refrigerator is 200 TR when working between - 8ºC and 26ºC. Determine the mass of ice produced per day from water at 26ºC. Also find the power required to drive the unit. Assume that the cycle operates on reversed Carnot cycle and latent heat of ice is 335 kJ/kg	CO2	8 Marks

UNIT-II

3.	a)	How does the increase in condenser temperature affect COP? Also explain the influence of evaporator temperature on COP. Which of the two temperatures have more influence on COP?	CO1	6 Marks
	b)	A vapour compression machine is used to maintain a temperature of -23ºC in a refrigerated space. The ambient temperature is 37ºC. The compressor takes in dry saturated vapour of F-12. A minimum 10ºC temperature difference is required at the evaporator as well as at condenser. There is no sub cooling of the liquid If the refrigerant flow rate is 1 kg/min, Find: i) Tonnage of refrigeration. ii) Power requirement. iii) Ratio of COP of this cycle to COP of Carnot cycle.	CO4	8 Marks
		(OR)		
4.	a)	What are essential properties of a good refrigerant?	CO1	4 Marks
	b)	A four cylinder, single acting R-12 compressor 30 cm x 40 cm runs at 960 r.p.m. The compressor clearance factor is 0.03 and the law of compression $PV^{1.1} = C$. The operating pressures for the vapour compression refrigeration system are: 8.47 bar (35ºC) and 1.004 bar (-30º). The refrigerant temperatures are: entering the compressor -20ºC, leaving the compressor 50ºC; entering the condenser 45ºC, leaving the condenser 25ºC, entering the expansion valve 30º and leaving the evaporator dry saturated. Assuming that heat removed in the compressor is 25 kJ/sec. calculate: i) The refrigerating capacity. ii) The compressor power. iii) COP. iv) Mass of condensing cooling water assuming the rise in temperature to be 10ºC. v) Also tabulate energy balance for 1 kg of refrigerant.	CO4	10 Marks

UNIT-III

5.	a)	Discuss the advantages of vapour absorption refrigeration system over vapour compression refrigeration system.	CO1	7 Marks
	b)	In a vapour absorption refrigeration system, heating, cooling and refrigeration takes place at the temperatures of 100ºC, 20ºC and -5ºC respectively. Find the maximum C.O.P of the system.	CO3	7 Marks

(OR)

6.	a)	What is thermo electric refrigeration system? List out the merits and demerits of thermo-electric refrigeration system over other refrigeration system. What are the fields of its applications?	CO2	7 Marks
	b)	Determine the COP of a vapour absorption refrigeration system when the temperature of generator is 120ºC, the temperature of the condenser is 30ºC and the temperature of the evaporator is -20º C. What would be its COP if it were a Carnot.	CO2	7 Marks

UNIT-IV

7.		The following data apply to an air conditioning system: Room sensible heat =41868kJ/hr ; room latent heat=41868 kJ/hr; inside design condition= 25º, 50**%** RH, outside design condition=35°C,DBT, 27**.**8 WBT. Return air from the room is mixed with the outside air before entering the cooling coil in the ratio of 4**:**1. Return air from the room is mixed with the cooling air, i.e. after the cooling coil in the ratio of 1**:**4. Cooling coil by pass factor is 0**.**1. The air may be reheated if necessary before supplying to the conditioned space. Assume ADP as 10ºC and determine, i) Supply air conditions into the room. ii) Refrigeration load due to the reheat. iii) Total refrigeration capacity. iv) The quantity of fresh air supplied.	CO5	14 Marks

(OR)

8.	a)	Explain in brief, an adiabatic saturation process. Represent the same on a psychrometric chart.	CO1	6 Marks
	b)	Ten grams of moisture per kg of dry air is removed from atmospheric air when it is passed through an air conditioning system and its temperature becomes 20ºC. The atmospheric conditions are 40ºC DBT and 60**%** RH. Find the following for the conditioned air: i) Relative humidity. ii) Wet-bulb temperature. iii) Dew point temperature. iv) Enthalpy change for the air. Assume standard atmospheric pressure.	CO6	8 Marks

UNIT-V

9.	a)	Discuss the filters used in air conditioning systems.	CO1	7 Marks
	b)	Explain the use of heat pump for heating and cooling cycle with a neat diagram.	CO1	7 Marks

(OR)

10.	a)	Define human comfort and explain the factors which affect human comfort.	CO1	7 Marks
	b)	Discuss various types of duct systems and their applications.	CO1	7 Marks

CODE No.: 16BT50501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

COMPUTER NETWORKS
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Compare Optical Fibers and Copper Cable Guided Transmission Mediums.	CO2	7 Marks
	b)	With a neat diagram, explain ISO - OSI reference model.	CO1	7 Marks
		(OR)		
2.	a)	What are the reasons for using layered protocols? Explain in detail.	CO1	7 Marks
	b)	List the requirements in building a computer network.	CO1	7 Marks

UNIT-II

3.	a)	Suppose we want to transmit the "message 1011 0010 0111 and protect it from errors using the CRC polynomial $x^4 + x^2 + 1$. Use polynomial long division to determine the message that should be transmitted. Suppose the leftmost bit of the message is inverted due to noise on the transmission link. What is the result of the 'receiver's CRC calculation? How does the receiver know that an error has occurred?	CO4	7 Marks
	b)	Explain the algorithm used for reliable transmission and flow control.	CO1	7 Marks
		(OR)		
4.	a)	Describe random access protocols with their merits and demerits.	CO1	7 Marks
	b)	Compare Fast Ethernet and Gigabit Ethernet Technologies.	CO2	7 Marks

UNIT-III

5.	a)	Draw and explain about Header format of Internet Protocol version 4.	CO1	7 Marks
	b)	A network on the Internet has a subnet mask of 255.255.240.0. What is the maximum number of nodes it can handle?	CO3	7 Marks
		(OR)		
6.	a)	What is meant by Anycast Routing? Explain with an example.	CO1	6 Marks
	b)	Recall various Network Layer design issues.	CO1	8 Marks

UNIT-IV

7.	a)	Compare TCP congestion control mechanisms.	CO2	8 Marks
	b)	What is the total size of the minimum TCP MTU, including TCP and IP overhead but not including data link layer overhead?	CO2	6 Marks
		(OR)		
8.	a)	A client uses UDP to send data to server. The data length is 16 bytes. Calculate the efficiency of this transmission at the UDP level (ration of useful bytes to total bytes).	CO4	6 Marks
	b)	Briefly explain the following Timers in TCP. i) Retransmission Time Out. ii) Persistence Timer	CO1	8 Marks

UNIT-V

9.	a)	Describe the Distribution of Domain Name System(DNS) Name Space.	CO1	6 Marks
	b)	Consider DNS servers.	CO2	8 Marks
		i) Compare two approaches, obtaining a name from a file in a remote machine and from a DNS server of the local ISP.		
		ii) Describe the relationship between a domain name taken from a DNS server and an IP address subnet.		

(OR)

10.	a)	Summarize the principles of application layer protocols.	CO2	6 Marks
	b)	Explain in detail about Simple Mail Transfer Protocol.	CO1	8 Marks

CODE No.: 16BT51203 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

WEB TECHNOLOGIES
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Name different types of lists supported by HTML. Distinguish between HTML and HTML5.	CO1 CO2	7 Marks
	b)	Explain the following HTML tags with suitable example. i) <pre> ii) <canvas> iii) <img> iv)	CO1	7 Marks
		(OR)		
2.	a)	Explain various form elements of HTML with suitable example.	CO1	7 Marks
	b)	Explain the following HTML tags with suitable example. i) <font> ii) <meta> iii) <p> iv) <video>	CO1	7 Marks

UNIT-II

3.	a)	Classify CSS selectors and explain.	CO2	7 Marks
	b)	Design a web page that display credit card type and then validate the entered card number according to the card type.	CO6	7 Marks
		(OR)		
4.	a)	Explain the following pre-defined objects of JavaScript. i) Window. ii) Document.	CO1	7 Marks
	b)	Develop a web page to convert Indian rupees to Foreign currency. Read the Indian rupees through input dialog and select foreign currency to which Indian rupees are converted using drop down menu.	CO6	7 Marks

UNIT-III

5.		Develop a mobile optimized website for displaying the images using responsive classes.	CO5	14 Marks
		(OR)		
6.		Develop Contact Us Web Page using the grid system in bootstrap.	CO5	14 Marks

UNIT-IV

7.	a)	Build a PHP Page that reads User Name and Favorite Color from the html form and then display user name in green color and sets user favorite color as a background color to the web page.	CO4	8 Marks
	b)	Demonstrate the implementation of Object Cloning in PHP.	CO1	6 Marks
		(OR)		
8.	a)	Develop a PHP code to implement constructor.	CO3	8 Marks
	b)	Demonstrate OOP principles with suitable example using PHP.	CO1	6 Marks

UNIT-V

9.	a)	Define a prepared statement. Explain in detail with the suitable program.	CO3	7 Marks
	b)	Create a web page to perform form data validation in PHP.	CO4	7 Marks
		(OR)		
10.	a)	List the different authentication methodologies used in PHP.	CO1	7 Marks
	b)	Design a web page to store the contact us form data in the database using PHP. (Note: contact us page contains the following fields Name, Email, subject, message and submit button).	CO3	7 Marks

❀ ❀ ❀

CODE No.: 16BT51501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

COMPILER DESIGN
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Compare Recursive interpreters and Iterative interpreters.	CO1	7 Marks
	b)	Write the specification of YACC parser generator and explain with example.	CO5	7 Marks

(OR)

2.	a)	Explain Input buffering with example.	CO1	7 Marks
	b)	Give the Specification of Tokens.	CO1	7 Marks

UNIT-II

3.		Form ACTION/GOTO table for the following grammar S → L=R |R L → *R |id R → L Justify whether the grammar is LR(0) or not.	CO3	14 Marks

(OR)

4.	a)	Define Ambiguous grammar. Eliminate ambiguity for the grammar E→E+E/E-E/(E)/id.	CO3	7 Marks
	b)	Give the limitations of Recursive descent parser.	CO1	7 Marks

UNIT-III

5.	a)	List out some typical semantic errors. Explain how they can be rectified.	CO1	7 Marks
	b)	Define static checking. Give some examples of static checks.	CO1	7 Marks

(OR)

6.	a)	Write a syntax directed translation scheme for desk calculator grammar L→En E→E+T E→T T→T*F T→F F→ (E) F→digit.	CO4	8 Marks
	b)	Write Type Expression for the type an array of pointers to real, where the array index ranges from 1 to 100.	CO1	6 Marks

UNIT-IV

7.	a)	Compare various forms of three address code.	CO1	7 Marks
	b)	Convert the following arithmetic expression into syntax tree and three address code $b^* - (a + b)$.	CO4	7 Marks

(OR)

8.	a)	Explain the usage of search tree in implementing symbol table.	CO1	7 Marks
	b)	Differentiate between formal parameters and actual parameters. Explain about activation of procedure/function.	CO6	7 Marks

UNIT-V

9.	a)	Discuss various object code forms.	CO1	7 Marks
	b)	Design an algorithm for code generation from there address code.	CO3	7 Marks

(OR)

10.	a)	With an example, explain peephole optimization.	CO2	7 Marks
	b)	Explain code generation algorithm with the function GETREG.	CO1	7 Marks

CODE No.: 16BT60118 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

RURAL TECHNOLOGY

[Electrical and Electronics Engineering, Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss briefly about impacts occurred while transferring the technology.	CO1	7 Marks
	b)	Explain the role of technology in poverty eradication in rural development.	CO1	7 Marks

(OR)

2.	a)	Thandrapadu is one of the backward village in Kurnool District with lack of infrastructure facilities. Choose the technologies that can improve the rural infrastructure.	CO4	7 Marks
	b)	List out and explain the different ways how you will eradicate poverty.	CO1	7 Marks

UNIT-II

3.	a)	Kumar is a young doctorate in Mechanical engineering from NIT Trichy and carried out his research in renewable energy sources. He wants to implement his ideas in rural areas. How can he help rural areas in using solar energy?	CO4	7 Marks
	b)	Ramesh who supplies solar cooker from Bangalore and want to sell in the village. What is the principle behind the working of solar cooker?	CO2	7 Marks

(OR)

4.	a)	The increase of wood waste and animal waste is more in the village Ramapuram which is near to the forest area. Show how the waste can be used by the rural people with the technology for cooking?	CO4	7 Marks
	b)	Explain briefly about procedure involved in concentration solar power and photovoltaic cells for generation of electricity.	CO2	7 Marks

UNIT-III

5.	a)	Define tissue culture. Explain briefly how the production of one of the ornamental plant orchids can be increased with the plant tissue culture.	CO4	7 Marks
	b)	Explain the role of food and agro based technologies in rural development.	CO4	7 Marks

(OR)

6.		Discuss how food and agro based technologies gives employment and profits to community with government partnership.	CO1	14 Marks

UNIT-IV

7.	a)	Raghunath is an agricultural scientist wants to give awareness to the rural people about the usage of organic fertilizers in the crop filed. Suggest the importance and uses of bio fertilizers.	CO6	7 Marks
	b)	Pandurangapuram which is one of the villages in the drought prone area of the Rayalaseema area. Show how rain water technology is useful for the village.	CO4	7 Marks

(OR)

8.	a)	Write the importance of medical and aromatic plants and explain their need in community development.	CO5	7 Marks
	b)	Give solution how dry land can be converted to farming land keeping in view of bio-fertilizers.	CO2	7 Marks

UNIT-V

9.	a)	What is meant by CSR? How development can be achieved with the involvement of private sector participation in the rural area?	CO3	7 Marks
	b)	Write a short note on Sansaad Aadarsh Gram Yojana.	CO1	7 Marks

(OR)

10.		What are the various ICT applications? How it is applicable to rural India?	CO2	14 Marks

CODE No.: 16BT60501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

SOFTWARE TESTING
[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define early testing. List the benefits of early testing.	CO1	7 Marks
	b)	What is the psychology behind testing by an independent team?	CO1	7 Marks
		(OR)		
2.	a)	Compare manual testing and automated testing.	CO2	8 Marks
	b)	Define test strategy matrix. Explain.	CO1	6 Marks

UNIT-II

3.	a)	What is loop testing? Explain various loops.	CO1	8 Marks
	b)	Explain data flow testing in detail.	CO1	6 Marks
		(OR)		
4.	a)	Differentiate statement coverage and condition coverage.	CO2	8 Marks
	b)	Explain multiple condition coverage.	CO1	6 Marks

UNIT-III

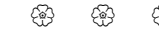
5.	a)	List the steps involved in deriving test cases using cause effect graphing based testing.	CO2	7 Marks
	b)	Derive the test cases for the following scenario. "A program has been designed to determine the nature of roots of a quadratic equation. The quadratic equation takes three input values from the range [0, 100]."	CO3	7 Marks
		(OR)		
6.	a)	Design a finite state machine which accepts "aabb" character sequence in a given text.	CO3	7 Marks
	b)	Write an algorithm that simulates the behavior of finite state machine.	CO1	7 Marks

UNIT-IV

7.		Test the Auto Teller Machine software by developing the following. i) Unit test plan. ii) Integration test plan. iii) System test plan.	CO6	14 Marks
		(OR)		
8.		Consider a project with the following components: EI(Simple)=30, EO(average)=20, EQ(average)=35, ILF(complex)=8, ELF(complex)=05. In addition, the system requires significant end-user efficiency, moderate distributed data processing, critical data communications, and other GSCs are incidental. Compute the function points for this system using FPA.	CO4	14 Marks

UNIT-V

9.	a)	Explain the need for automated testing tools.	CO1	7 Marks
	b)	Analyze the steps involved in selecting software testing tools.	CO2	7 Marks
		(OR)		
10.		Evaluate the role software size metrics on software quality.	CO5	14 Marks



CODE No.: 16BT60501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

SOFTWARE TESTING

[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain Software Testing Model with neat diagram.	CO1	8 Marks
	b)	Explain Software testing as process. Justify?	CO1	6 Marks
		(OR)		
2.	a)	Define STLC and explain each step in detail.	CO1	8 Marks
	b)	Compare Positive and Negative testing.	CO2	6 Marks

UNIT-II

3.	a)	Distinguish between decision node and junction node.	CO2	7 Marks
	b)	Design Test cases for Statement coverage and Branch coverage. Explain with an appropriate example.	CO3	7 Marks
		(OR)		
4.	a)	Explain data flow testing in detail.	CO1	6 Marks
	b)	Write a program to display the prime numbers up to a given number. Draw the control flow graph and calculate the cyclomatic complexity number for the given program.	CO4	8 Marks

UNIT-III

5.	a)	List and explain the elements of state testing.	CO1	7 Marks
	b)	Identify the possible states, inputs of a software process and draw its corresponding state table.	CO2	7 Marks
		(OR)		
6.	a)	Describe the need of state table. Explain the process of converting state table into test cases.	CO3	7 Marks
	b)	"Error Guessing is an ad hoc approach for testing." Comment on this statement.	CO1	7 Marks

UNIT-IV

7.	a)	Discuss the key components of test management.	CO1	7 Marks
	b)	Analyze the role testing group activities for conducting software testing effectively.	CO2	7 Marks
		(OR)		
8.	a)	List the differences between size oriented metrics and function point analysis metrics.	CO2	7 Marks
	b)	Explain the process of calculating function points of real time software.	CO4	7 Marks

UNIT-V

9.	a)	Identify the different parameters required for evaluating regression test selection techniques.	CO2	7 Marks
	b)	T contains 90 tests of which 20 are modification-revealing for P and P' and M selects 12 of these 20 tests, then calculate the inclusiveness of M relative to P, P' and T.	CO4	7 Marks
		(OR)		
10.	a)	Apply the regression testing techniques on measuring software quality.	CO5	7 Marks
	b)	Use web application testing tool to insert standard checkpoints for flight application.	CO6	7 Marks

❀ ❀ ❀

CODE No.: 16BT61201 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

CLOUD COMPUTING
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	How Virtualization is useful for Cloud Computing? Justify.	CO1	7 Marks
	b)	List various types of Virtualization Technologies.	CO1	7 Marks
		(OR)		
2.		Explain features and services of XEN Virtualization Technology.	CO1	14 Marks

UNIT-II

3.	a)	Define Cloud Computing. Illustrate the important Characteristics of Cloud Computing.	CO1	7 Marks
	b)	Compare Grid Computing ***vs***. Cloud Computing.	CO2	7 Marks
		(OR)		
4.		List various types of clouds with suitable examples.	CO1	14 Marks

UNIT-III

5.	a)	Compare and Contrast Web Technology and Service Technology.	CO2	7 Marks
	b)	Sketch Cloud Computing Architecture according to NIST standard and explain in-detail.	CO2 CO5	7 Marks
		(OR)		
6.		Evaluate various components in Cloud Architecture. i) Workload Distribution. ii) Resource Pooling. iii) Dynamic Scalability. iv) Elastic Resource Capacity.	CO4	14 Marks

UNIT-IV

7.	a)	Distinguish between **IaaS** and **PaaS** with services and features.	CO2	7 Marks
	b)	Analyze various Disasters in Cloud Computing. Explain. i) Cloud Scale l. ii) Disasters in the Cloud.	CO2	7 Marks
		(OR)		
8.		Discuss various security issues of Cloud security.	CO2	14 Marks

UNIT-V

9.		Create SVEC College web application using IBM Bluemix cloud.	CO5	14 Marks
		(OR)		
10.		Design and develop bucket instance with 4GB storage space using Amazon Web Services.	CO6	14 Marks

CODE No.: 16BT61503 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

SOFTWARE PROJECT MANAGEMENT

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	How do we estimate software? Explain various components of a good cost estimate process with example.	CO1	14 Marks

(OR)

2.	What are the ways of achieving better economics in software? Explain with some examples.	CO1	14 Marks

UNIT-II

3.	How do you evaluate the completion of each of the four phases in software life cycle?	CO1	14 Marks

(OR)

4.	Illustrate the modern principles of software project management.	CO2	14 Marks

UNIT-III

5.	What are the 7 workflows in the life cycle? Explain the artifacts of each of them.	CO3	14 Marks

(OR)

6.	Illustrate the Model based Architecture with example.	CO2	14 Marks

UNIT-IV

7.	Explain in detail about the check point of process.	CO4	14 Marks

(OR)

8.	Explain in detail about the project organization and responsibilities.	CO5	14 Marks

UNIT-V

9.	List all quality indicators and management indicators. Explain their role in project control.	CO6	14 Marks

(OR)

10.	What are roles of Project manager in the Agile management and benefits of Agile management?	CO3	14 Marks

CODE No.: 16BT70101 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

ESTIMATION AND QUANTITY SURVEYING

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. Estimate the detailed quantity for the following items of two roomed building from the given plan and cross section as shown in Fig.1, by using long wall and short wall method**.** CO4 14 Marks

   i) Earth work excavation.
   ii) Brick work in CM (1:4) for substructure up to plinth level.
   iii) R.C.C. slab with (1:1.5:3)
   iv) Inside Plastering in cm (1:5) with 12 mm thick.

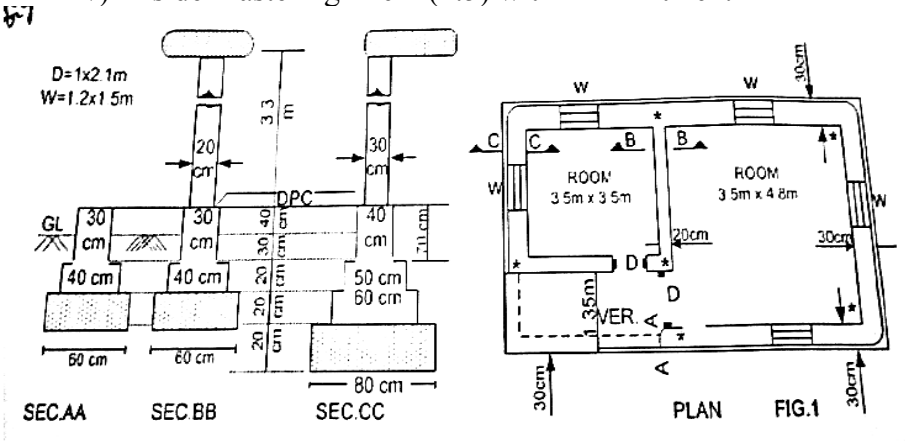


Fig. 1

(OR)

2. Estimate the quantities of the building items of a hexagonal room from the given plan and section as shown in Fig.2, by using center line method. CO4 14 Marks

   i) Earthwork excavation for foundation.
   ii) I-Class brick work for super structure.
   iii) Plastering in CM (1:5), 20 mm thick for inside walls.

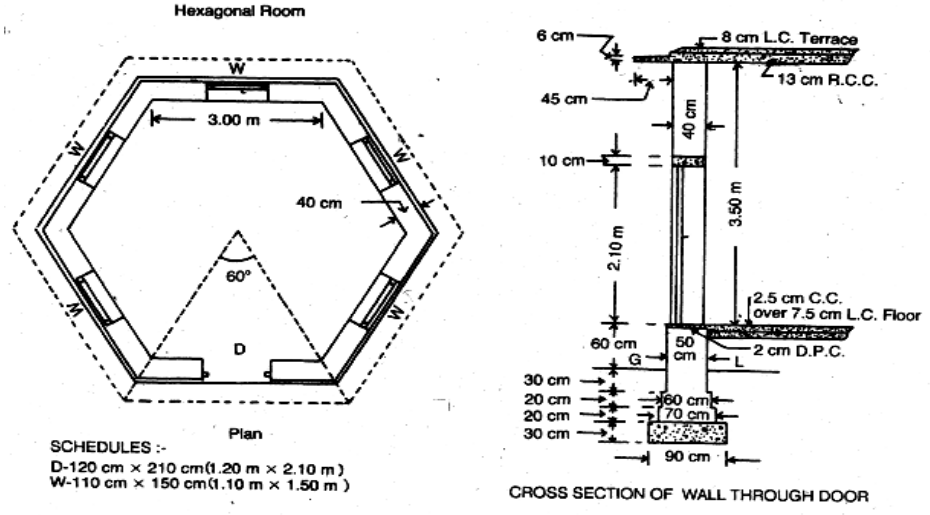
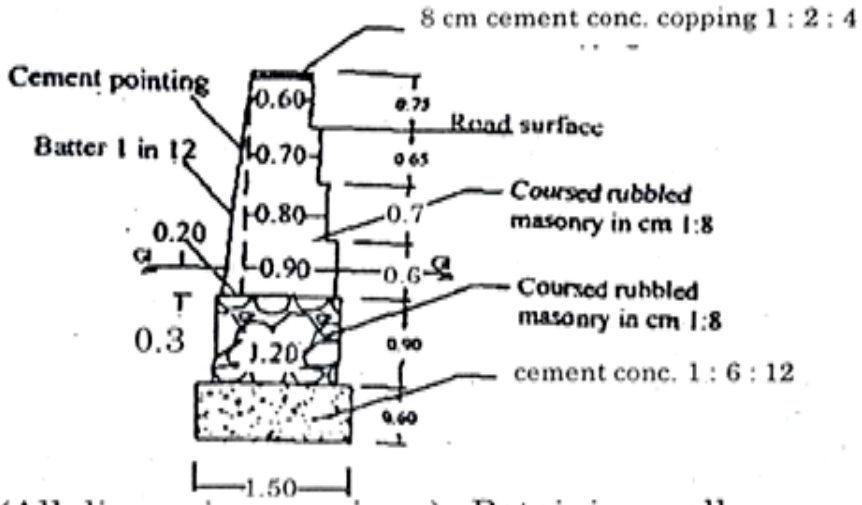


Fig. 2

UNIT-II

3. a) Estimate the quantity of sanitary line using NP_2 RCC Hume pipe line for 1 km with a trench size of 75 cm breadth and 1.50 m depth and alround sand filling with 40 cm thick including refilling the excavated earth etc. complete. CO2 7 Marks

b) Estimate the quantities of the retaining wall shown in figure below. CO2 7 Marks



(All dimensions are in m) Retaining wall.

(OR)

4. a) What are the different methods for computation of earth work excavation in road embankments? CO1 6 Marks

b) Prepare a detailed estimate for construction of a new state highway for 1km length. The formation width of the road is 10m, average height of the bank is 1m and side sloes are 2:1. The metal width is 3.7 meters with bottom layer PCC 1:4:8 with 150mm thick and top layers CC 1:1.5:3 with 300mm thick. CO2 8 Marks

UNIT-III

5. a) Write the types of specification. Give their advantages and disadvantages. CO1 7 Marks

b) Describe the general specification for first class buildings. CO3 7 Marks

(OR)

6. Evaluate the cost of the following items of work as per SSR. CO4 14 Marks

i) Brick masonry in CM (1:6) for superstructure.
ii) Plastering in CM (1:4), 12 mm thickness.
iii) White washing with 3 coats including primary coat for walls.

UNIT-IV

7. a) Describe the legal requirements of a contract. CO3 7 Marks

b) What is negotiated contract? Describe briefly labour contract. CO1 7 Marks

(OR)

8. a) Define arbitration. What are the requirements of arbitration? CO1 7 Marks

b) Discuss the types of termination of contract. CO1 7 Marks

UNIT-V

9.	a)	List the different methods of depreciation.	CO1	6 Marks
	b)	Calculate the annual rent of a building with the following data. Cost of land = Rs.20,000/- Cost of building = Rs.80,000/- Estimate life = 80years Return expected = 5% on land 6% on building Annual repairs are expected to be 0.7% of the cost construction and other out goings will be 25% of the gross rent.	CO2	8 Marks

(OR)

10.	a)	State the following terms : i) Scrap valve. ii) Salvage valve. iii) Book valve. iv) Market valve.	CO1	6 Marks
	b)	An old building has been purchased by a person at a cost of Rs.30,000/- excluding the cost of the land. Evaluate the amount of annual sinking fund at 4**%** interest assuming the future life of the building as 20 years and scarp value of the building as 10% of the cost of purchase.	CO6	8 Marks

CODE No.: 16BT70102 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

GEOSPATIAL TECHNOLOGY
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define: i) tilt. ii) focal length. iii) isocentre.	CO1	6 Marks
	b)	Define aerial photogrammentry and its types.	CO1	8 Marks
		(OR)		
2.	a)	Define Mosaic and its types.	CO2	7 Marks
	b)	Define stereoscopy and its determination.	CO2	7 Marks

UNIT-II

3.		What are the various elements of Remote Sensing? Analyze the Electromagnetic spectrum in brief.	CO3	14 Marks
		(OR)		
4.	a)	Compare the spectral reflectance characteristics of water and vegetation.	CO3	7 Marks
	b)	Define Resolution. Classify the resolutions of the sensors.	CO3	7 Marks

UNIT-III

5.		Analyze the fundamental operations of GIS in detail.	CO2	14 Marks
		(OR)		
6.		Distinguish between Raster GIS and vector GIS.	CO2	14 Marks

UNIT-IV

7.		Evaluate various surface analysis tools and explain the slope analysis in GIS.	CO6	14 Marks
		(OR)		
8.		Classify the segments of Global Positioning System (GPS).	CO4	14 Marks

UNIT-V

9.		Demonstrate the process of Land use and Land cover mapping with help of RS and GIS.	CO5	14 Marks
		(OR)		
10.		Demonstrate the role of RS and GIS and give suitable recommendation for sustainable watershed management.	CO7	14 Marks

CODE No.: 16BT70103 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

RAILWAY, AIRPORT AND HARBOUR ENGINEERING

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What is a sleeper? List the functions, types of sleepers and compare one another.	CO1	7 Marks
	b)	What are the requirements of an ideal rail joint? Also explain the various rail joints used in railways with neat sketches.	CO1	7 Marks
		(OR)		
2.	a)	Compare the widening of gauges on curves with formula and coning of wheels with neat sketches.	CO2	7 Marks
	b)	If the wheel base of a vehicle moving on a B.G track is 6m, the diameter of wheel is 1.5m and depth of flange below the top of rail is 3.17 cm. Determine the extra width required to be provided on a gauge, if the radius of the curve is 160 m.	CO6	7 Marks

UNIT-II

3.	a)	Describe in detail about plate laying techniques.	CO5	7 Marks
	b)	Discuss in detail about the modern methods of maintenance of railway tracks.	CO4	7 Marks
		(OR)		
4.	a)	Summarize how poor soil is being stabilized and explain the methods in detail.	CO1	7 Marks
	b)	Discuss the materials required for track laying and list the factors considered in the construction of railway track.	CO1	7 Marks

UNIT-III

5.	a)	List the factors to be considered for the selection of site for a commercial airport.	CO1	7 Marks
	b)	What are the basic patterns of runway configurations? Discuss each pattern.	CO1	7 Marks
		(OR)		
6.	a)	Explain the importance of airport planning.	CO1	7 Marks
	b)	What are the characteristics of a good airport layout?	CO1	7 Marks

UNIT-IV

7.	a)	What are the items to be considered in the geometric design of runway and explain it in detail?	CO3	7 Marks
	b)	Write the construction procedure of the windrose diagram.	CO5	7 Marks
		(OR)		
8.	a)	Write in detail the various design elements to be considered in taxiway laying as per IS standards.	CO8	7 Marks
	b)	The length of a runway at mean sea level, standard temperature and zero gradients is 1600m. The site has an elevation of 320m, with a reference temperature of 33.6ºC. The runway has to be constructed with an effective gradient of 0.25%. Calculate the actual length of the runway at site.	CO3	7 Marks

UNIT-V

9.	a)	Write in detail about Inland water transports and coastal protection works.	CO5	7 Marks
	b)	Discuss the factors to be considered while selecting a suitable site for the construction of a port.	CO1	7 Marks

(OR)

10.	a)	Discuss in detail about the environmental concern required for port operation.	CO7	7 Marks
	b)	What are the components of a harbour? Draw neat sketches of the layout of an artificial harbour and road stead.	CO1	7 Marks

CODE No.: 16BT70104 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

ADVANCED FOUNDATION ENGINEERING

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

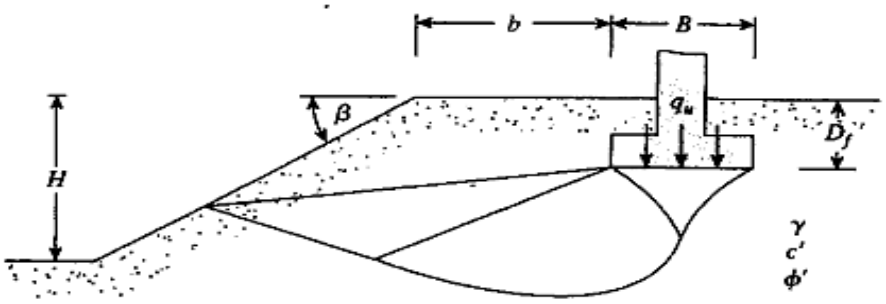
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Write a short note on determination of bearing pressure using Pressure meter and Dilatometer.	CO1	6 Marks
	b)	Calculate the net allowable bearing pressure and ultimate load of rectangular footing 2 m x 4 m in plan, founded at a depth of 1.8 m below ground surface. The load on footing acts at an angle of 15° to the vertical and is eccentric in the direction of width and length by 20 cm and 30 cm respectively. The saturated unit weight of the soil is 18 kN/m^3. Natural water table is at a depth of 2 m below ground level. The unit cohesion of soil is 30 kN/m^2 and soil friction angle is 27°.	CO2	8 Marks

OR)

2.	a)	Where do you provide a combined footing? Discuss the procedure for the design of rectangular combined footing.	CO1	6 Marks
	b)	The figure shows a shallow foundation in clay. The following data are given: B=1.2 m; D_f=1.2 m; b=0.8 m; H=6.3 m; slope angle=30^0, unit weight of soil=17.5 kN/m^3, φ=0 and c=50 kN/m^2. Determine the gross allowable bearing capacity with a factor of safety 4. N_c=6.3.	CO6	8 Marks



UNIT-II

3.	a)	Describe briefly Reese and Matlocks theory of analysis and design of laterally loaded piles.	CO1	6 Marks
	b)	A concrete pile of 13 m length and 405 mm x 405 mm in cross section is embedded in saturated clay (c_u=85 kN/m^2, γ = 18 kN/m^3). Determine the allowable load that the pile can carry (F.S = 4). Use the α method for determining the skin resistance (α = 0.6).	CO6	8 Marks

(OR)

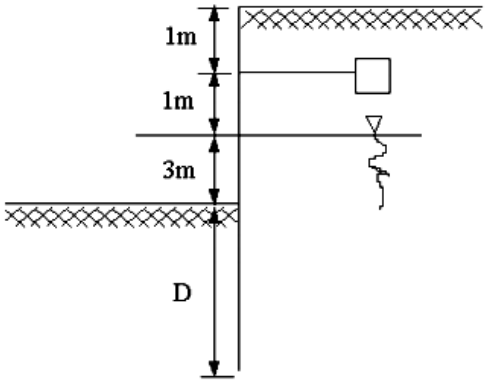
4.	a)	Discuss the evaluation of lateral resistance of rigid and flexible piles.	CO1	6 Marks
	b)	A friction pile group is carrying a load of 3000 kN including the weight of the pile cap at a site where the soil is uniform clay to a depth of 20 m, underlain by rock. The clay may be assumed to be of normal sensitivity and normally loaded, with liquid limit 60%. Number of piles =16, length of pile = 11 m, diameter of pile = 0.5, spacing of piles = 1.5 m centre to centre, unit weight = 16 kN/m^3, initial void ratio = 1.0. Compute the settlement of the group.	CO2	8 Marks

UNIT-III

5.	a)	Write about the cantilever sheet piling in granular soils.	CO1	6 Marks
	b)	A cantilever sheet pile is to be constructed to retain sandy soil to a depth of 6 m. The dry unit weight of sand is 16 kN/m^3 and the saturated unit weight is 20 kN/m^3. The angle of shearing resistance of sand is 32^0. The water level is 3 m above the dredge line. Design the depth of embedment of the sheet pile.	CO3	8 Marks

(OR)

6.	a)	Sketch a typical section of a braced cut and show the various components.	CO8	6 Marks
	b)	Design an anchored bulkhead for its depth and determine the force in the tie rod of the anchored bulkhead shown in figure. The backfill and the soil below the dredge line is sand, having the following properties: G=2.6, e=1.0 and ϕ=30^0. Use the free earth support method.	CO3	8 Marks



UNIT-IV

7.	a)	How to classify an expansive soil based on its liquid limit, plasticity index, shrinkage limit and percentage of clay fraction?	CO1	7 Marks
	b)	How lime column technique minimizes the swelling and shrinkage characteristics of expansive soils?	CO5	7 Marks

(OR)

8.	a)	Describe the method of replacement of the expansive soil with a good quality soil. How would you solve the problem of constructing a footing using this method?	CO4	7 Marks
	b)	Determine the capacity of 5.0m long single under-reamed pile of stem diameter 40 cm. The stratum is a deep deposit of medium dense sand having γ = 18 kN/m^3 and ϕ = 30^0.	CO2	7 Marks

UNIT-V

9.	a)	What are the different types of marine structures? Explain types and choice of breakwaters in brief.	CO1	6 Marks
	b)	Write a brief note on the design of Rubble Mound Breakwaters as per IS code.	CO7	8 Marks

(OR)

10.		Write short notes on the following: i) Breakwaters. ii) Wharves. iii) Jetties. iv) Ship Impact.	CO1	14 Marks

CODE No.: 16BT70119 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

BRIDGE ENGINEERING
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

(Use of codes IRC:6-2014, IRC:21-2000, IS 456:2000, IRC:83-(Part-I)-1999, IRC:83-(Part-II)-1987 and Pigeaud's curves are permitted in the examination hall)

UNIT-I

1.	a)	What are the different types of live loads considered in the design of RCC bridges? Explain them.	CO1	8 Marks
	b)	Explain the gauges which are used in railways.	CO1	6 Marks

(OR)

2.	a)	Discuss about general design requirements of bridges.	CO8	7 Marks
	b)	Mention the importance of investigation of site in bridge design.	CO1	7 Marks

UNIT-II

3. Design the RC box culvert bridge, situated in the state highway with following data: CO3 14 Marks

Width of the bridge	:	12 m
Wearing course	:	56 mm thick
Condition of exposure:		Moderate
Depth of foundation	:	1.35 m
Clear span	:	5 m
Height of the vent	:	3 m
Load case	:	AA tracked vehicle

M25 grade concrete and HYSD bars.

(OR)

4. Design a reinforced concrete slab bridge using the following data: CO3 14 Marks

Clear width of road way	=	7.8m
Clear span	=	11m
Live load	=	IRC class AA.

Use M-25 grade concrete and Fe 415 steel.

UNIT-III

5. Design the interior slab panel of a reinforced concrete T-beam bridge using the following data by Pigeauds method. CO5 14 Marks

Clear width of road way	=	8m
Effective span	=	16m
Live load	=	class AA.

Use M-20 grade of concrete and Fe 415 steel.

(OR)

6. Design the intermediate longitudinal girder of the bridge by Courbon's method for the maximum loading of class AA tracked vehicle. An RCC bridge consists of 3 longitudinal girders of span 15 m each with 4 cross beams at appropriate places. Assume the other preliminary dimensions of this two lane bridge as per the IRC specifications, moderate exposure and cement concrete wearing coat. CO5 14 Marks

UNIT-IV

7.	a)	Explain the forces acting on bridge bearings.	CO2	5 Marks
	b)	Design a steel rocker bearing for transmitting a vertical reaction of 1100kN and a horizontal reaction of 150kN at the support of a bridge girder, assuming the following permissible stresses according to IRC. Permissible compressive stress in concrete bed block = 5 N/mm^2 Permissible bending stress in steel plate = 165 N/mm^2 Permissible bearing stress in steel plate = 190 N/mm^2 Permissible shear stress in steel = 110 N/mm^2 Sketch the typical details of the rocker bearing.	CO3	9 Marks

(OR)

8.		Design an elastomeric pad bearing to support a tee beam girder of a major bridge using the fallowing data: Maximum dead load reaction/bearing = 340 kN Maximum load reaction/ bearing = 550 kN Longitudinal force due to friction for each bearing = 35 kN Effective span of the girder = 23 m Estimated rotation at bearing of the girder due to dead and live loads = 0.003 radians. M20 grade concrete is used. Total estimated shear strain due to creep, shrinkage and temperature = 5 x 10^{-4} units. Draw the details of the bearing.	CO3	14 Marks

UNIT-V

9.	a)	List out the various forces acting on piers.	CO1	7 Marks
	b)	Specify the design principles of abutment as per code.	CO8	7 Marks

(OR)

10.		Write short note on: i) Bed block. ii) Wing walls and approach slab. iii) Bridge foundations.	CO1	14 Marks

CODE No.: 16BT70120 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

GROUND IMPROVEMENT TECHNIQUES
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What are the factors to be considered in the selection of best technique for the ground improvement?	CO1	6 Marks
	b)	Explain the suitability of ground improvement technique for different types of soils.	CO5	8 Marks
		(OR)		
2.	a)	List out the methods of ground improvement.	CO1	7 Marks
	b)	How the performance of black cotton soil can be improved. Discuss.	CO2	7 Marks

UNIT-II

3.	a)	What are dewatering methods available for the fine grained soils? Explain any one.	CO1	7 Marks
	b)	Explain the vacuum method of dewatering, in detail. Is this method environmental friendly. Discuss.	CO7	7 Marks
		(OR)		
4.	a)	Discuss the uses of single stage well point installation.	CO1	7 Marks
	b)	Explain in detail about electro–osmosis dewatering system.	CO5	7 Marks

UNIT-III

5.	a)	What is the principle of soil densification? List out the factors that affect compaction and discuss in brief.	CO1	7 Marks
	b)	List out the various in–situ densification methods in granular soils. Describe briefly vibro–compaction methods.	CO5	7 Marks
		(OR)		
6.	a)	What are the benefits of preloading a saturated clay deposit? Infer how the stone columns are useful for improving the properties of cohesive soils.	CO4	7 Marks
	b)	Explain the impact at ground surface and impact at depth methods of densifying granular soils, in brief.	CO5	7 Marks

UNIT-IV

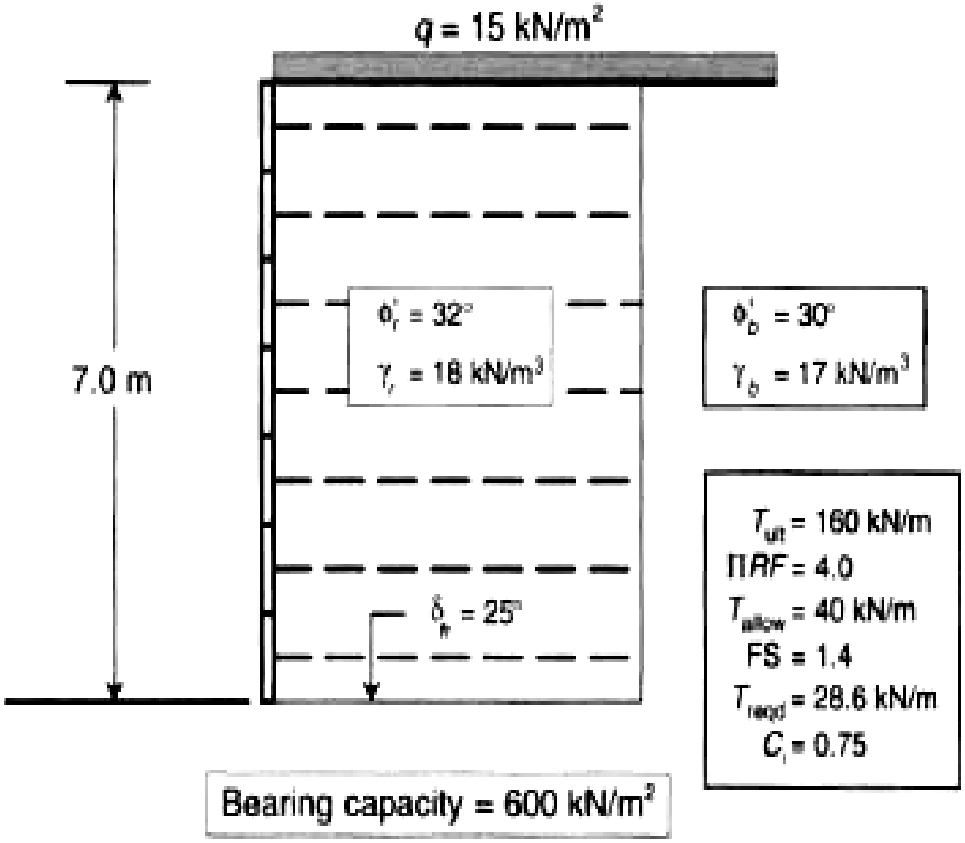
7.	a)	What are the various soil stabilization techniques? Write their suitability with respect to the soil type.	CO1	7 Marks
	b)	Write short notes on: i) Pre-grout investigation. ii) Post grout test. iii) Grout holes pattern. iv) Selection of grout characteristics.	CO1	7 Marks
		(OR)		
8.	a)	Describe in detail how chemicals are used in stabilizing the soil with the help of an example.	CO1	7 Marks
	b)	Write a note on suspension and solution grouting techniques and their effectiveness in improving the in-situ soil conditions.	CO5	7 Marks

UNIT-V

9.	a)	What is soil reinforcement? List various materials to be used as soil reinforcement. Discuss the internal stability aspects of reinforced earth walls.	CO6	7 Marks
	b)	Provide one application each of geomembrane and geogrid types of reinforcements.	CO1	7 Marks

(OR)

10.	a)	Explain the factors governing the design of reinforced soil walls. Write the construction sequence of a reinforced earth wall with vertical faces.	CO1	5 Marks
	b)	Design a 7m high geogrid-reinforced wall where the reinforcement spacing must be at 1.0m spacings, since the wall facing is of the articulated precast concrete type of this same dimension. The coverage ratio is 0.8 (i.e., geogrids do not cover the entire ground surface at each lift: they are slightly separated). The length-to-height ratio or the reinforced soil wall should not be less than 0.7 (i.e., L ~ 4.9m). Additional details of the problem including soil and geogrid data are shown in the diagram below.	CO3	9 Marks



❀ ❀ ❀

CODE No.: 16BT70201 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

POWER SYSTEM OPERATION AND CONTROL

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. A thermal power plant has three units with the following fuel cost characteristics: CO4 14 Marks

$F_1(P_1) = 570 + 7.5P_1 + 0.0017P_1^2$ Rs/Hr $600MW \le P_1 \le 150MW$

$F_2(P_2) = 380 + 7.8P_2 + 0.002P_2^2$ Rs/Hr $500MW \le P_1 \le 125MW$

$F_3(P_3) = 200 + 7.9P_3 + 0.005P_3^2$ Rs/Hr $600MW \le P_1 \le 150MW$

Obtain the economic operation schedule for these units for a total load demand of 750MW.

i) without considering generator limits.
ii) considering generator limits.
iii) total cost of operation for the above two cases and hence comment on the results.

(OR)

2. a) List the various performance indicators to quantify the accuracy of the forecasting modal. CO1 7 Marks

b) The load curve of an utility observed over a period of time is as follows: CO5 7 Marks

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019
Load (MW)	425	450	466	478	410	398	375	352	362

Estimate the load for the year 2020 using the moving average of order 4 and determine various errors to quantify the forecast accuracy.

UNIT-II

3. a) What are the important methods of hydro-thermal coordination? CO1 2 Marks

b) Derive the condition for economic generation of steam and hydro plants for short term scheduling. State the assumptions made. CO6 12 Marks

(OR)

4. Describe the hydro-thermal economic load scheduling. Derive the necessary equations. CO2 14 Marks

UNIT-III

5. a) What do you mean by unit commitment? Discuss various constraints related to unit commitment problem. CO2 7 Marks

b) Does Unit Commitment guarantee economic power of power generation? Justify your answer. CO2 7 Marks

(OR)

6. Discuss in detail, the priority list method for the solution of unit commitment problem with an example. CO2 14 Marks

UNIT-IV

7. a) Describe the fundamental characteristics of an excitation system. CO1 7 Marks

b) Draw and explain the block diagram representation of IEEE Type-1 model. CO2 7 Marks

(OR)

8.	a)	Design a static var compensator for a low voltage distribution system with the following specifications. System voltage = 400V Frequency, f = 50Hz Coil inductance L = 5.37mh The inductor saturates at 950 A and settles of 1.8mH at 1800A. Compensation is required over a range of -80KVAR to +30KVAR per phase.	CO3	7 Marks
	b)	Brief the merits of uncompensated transmission lines over compensated transmission lines.	CO2	7 Marks

UNIT-V

9.		For a single area system, show that the static error in frequency can be reduced to zero with integral control.	CO2	14 Marks

(OR)

10.		Explain the functioning of speed governing system and obtain its necessary mathematical modeling with neat diagram.	CO1	14 Marks

CODE No.: 16BT70202 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

SWITCHGEAR AND PROTECTION
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	With a neat sketch, enumerate the difference between definite time and inverse characteristic of relays.	CO1	7 Marks
	b)	Explain the principle of impedance type distance relay and its characteristics on V-I and R-X planes.	CO1	7 Marks
		(OR)		
2.	a)	Write short notes on: i) Reactance relay. ii) Mho relay. iii) Directional impedance relay.	CO1	6 Marks
	b)	Explain the directional impedance relay and its characteristic on R-X plane.	CO2	8 Marks

UNIT-II

3.	a)	Compare and analyze the properties of the SF_6 gas with other insulating mediums used for arc quenching in the circuit breakers.	CO2	7 Marks
	b)	Discuss the principle of operation of air-blast circuit breaker.	CO1	7 Marks
		(OR)		
4.	a)	Define and explain the following terms concerned to the protective device fuse. i) Fusing current. ii) Cut off current. iii) Operating time. iv) Breaking capacity.	CO1	6 Marks
	b)	What are the advantages and disadvantages of using air as the arc quenching medium?	CO1	8 Marks

UNIT-III

5.	a)	List the various abnormal conditions that occur in a generator and also mention the protective schemes available for the protection of generator.	CO1	6 Marks
	b)	Design suitable CTs on the HV side for a three-phase, 11 kV/ 132 kV, delta-star connected power transformer protected by differential protection. The CT's on the LV side have a current ratio of 500/5.	CO3	8 Marks
		(OR)		
6.		An alternator rated at 11 kV protected by the balanced circulating current system has its neutral grounded through a resistance of 12Ω. The protective relay is set to operates when these is an out of balance current of 1.8 A in the pilot wires, which are connected to the secondary of 1000/5 ratio current transformers. Determine: i) The percentage of the winding which remains unprotected. ii) The minimum value of the earthing resistance required to protect 80% of the winding.	CO4	14 Marks

UNIT-IV

7.	a)	Explain the principle of distance relaying applied to protection of radial transmission line.	CO1	7 Marks
	b)	Distinguish between reactance, impedance and mho relays as regards their applications to distance protection.	CO2	7 Marks

(OR)

8.	a)	Discuss various methods of protection of a transmission line and enumerate the advantages and disadvantages of each method.	CO2	7 Marks
	b)	What is a surge absorber? Write a short note on Ferranti surge absorber.	CO1	7 Marks

UNIT-V

9.	a)	A 132 kV, 3-phase, 50 Hz transmission line 200 km long consists of three conductors of effective diameter 20mm arranged in a vertical plane with 4m spacing and regularly transposed. Find the inductance and kVA rating of the arc suppression coil in the system.	CO5	7 Marks
	b)	What are the various adverse effects of not following the proper earthing techniques in designing of generators and transformers?	CO6	7 Marks

(OR)

10.	a)	Write a short notes on: i) Reactance grounding. ii) Arc suppression coil grounding.	CO1	6 Marks
	b)	A 50 Hz overhead line has line to earth capacitance of 1.2 μF. It is desired to use earth fault neutralizer. Determine the reactance to neutralize the capacitance of : i) 100% of the length of the line. ii) 90% of the length of the line. iii) 80% of the length of the line.	CO4	8 Marks

CODE No.: 16BT70204 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

FLEXIBLE AC TRANSMISSION SYSTEMS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss the need of reactive power control in electrical transmission.	CO1	7 Marks
	b)	Explain the concept of power flow in a simple two machine system. Determine the active and reactive power flows in the system.	CO2	7 Marks
		(OR)		
2.	a)	Enumerate the relative importance of controllable parameters.	CO1	8 Marks
	b)	Give the advantages of FACTS controllers	CO2	6 Marks

UNIT-II

3.	a)	Mention the significance and control of reactive power in transmission lines.	CO1	6 Marks
	b)	Distinguish the line and load compensators and mention their applicability.	CO1	8 Marks
		(OR)		
4.	a)	Enumerate the types of reactive power compensators and explain any one type of compensator briefly.	CO1	6 Marks
	b)	Derive the necessary equations of a shunt compensator connected at the end of the transmission line.	CO2	8 Marks

UNIT-III

5.	a)	The voltage magnitudes at the buses are reducing with the enhancement of the load. If the load is still increased, the system may collapse. Show with an appropriate compensation, the voltage profile should be maintained with the increase in the load.	CO4	6 Marks
	b)	Draw the control scheme for STATCOM and explain.	CO2	8 Marks
		(OR)		
6.	a)	Explain the working of STATCOM with a neat sketch. In what way it differs from SVC?	CO1	6 Marks
	b)	Compare various types of shunt compensators.	CO2	8 Marks

UNIT-IV

7.	a)	Describe the steps involved in modelling of TCSC.	CO1	7 Marks
	b)	Compare various types of static series compensators.	CO2	7 Marks
		(OR)		
8.	a)	Explain the V-I capability characteristics of single module TCSC.	CO1	6 Marks
	b)	For a two bus system, bus-1 is generator and bus-2 is load bus. The power in the transmission line between bus-1 and bus-2 is 40 MW. The respective transmission line capacity is 50 MW. If there is a sudden increase in the load up to 20 MW at bus-2, what happens to the transmission line? Design a suitable compensator for rectifying the above situation.	CO3	8 Marks

UNIT-V

9.	a)	A FACTS device having a combination of two or more series compensators connected in the power system can be used to analyze the power flow in the transmission line. Explain in detail the operation of those types of controllers.	CO5	7 Marks
	b)	Derive the expression for real and reactive power between two nodes of UPFC	CO2	7 Marks

(OR)

10.	a)	Write the objectives of Voltage and Phase Angle Regulators. Explain the power flow control by Phase Angle Regulators.	CO1	7 Marks
	b)	Explain the power transfer capability of UPFC and compare its capabilities with other FACTS controllers.	CO2	7 Marks

CODE No.: 16BT70208 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

POWER QUALITY

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What is power quality and explain various power quality issues in detail?	CO1	7 Marks
	b)	Discuss the responsibilities of suppliers and end users of electric power.	CO1	7 Marks

(OR)

2.	a)	Explain the various types of power quality disturbances and their impact on power systems.	CO1	7 Marks
	b)	Mention major reasons for the increased concern in power quality.	CO2	7 Marks

UNIT-II

3.	a)	Define waveform distortion. Explain the wave form distortion categories.	CO1	7 Marks
	b)	With neat schematic, explain in detail about short duration variations.	CO1	7 Marks

(OR)

4.		Investigate the role of UPS system in providing solution for power quality problems and improvement of power quality.	CO4	14 Marks

UNIT-III

5.	a)	Explain briefly about harmonic distortion and waveform distortion.	CO1	7 Marks
	b)	Brief out the effect of harmonic distortion on capacitors and transformers.	CO1	7 Marks

(OR)

6.		Explain a Passive filter design criteria and practical considerations used for design.	CO3	14 Marks

UNIT-IV

7.	a)	Explain the significance of Power quality monitoring. What are the important power quality monitoring standards?	CO1	10 Marks
	b)	What are the advanced measuring devices for power quality monitoring?	CO1	4 Marks

(OR)

8.	a)	Illustrate the power quality benchmarking process.	CO1	7 Marks
	b)	Identify a suitable power quality monitoring and measuring device to measure flicker and explain with functional blocks.	CO5	7 Marks

UNIT-V

9.		Explain in detail about the distributed generation and its impacts on the network.	CO1	14 Marks

(OR)

10.		Briefly discuss the power quality issues related to DG integration in distribution networks.	CO6	14 Marks

CODE No.: 16BT70210 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

SOFT COMPUTING TECHNIQUES

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Compare ANN with BNN.	CO1	7 Marks
	b)	Explain various architectures of ANN.	CO1	7 Marks
		OR)		
2.	a)	What is Linear separability? Single layer perceptron cannot solve XOR problem. Explain.	CO2	6 Marks
	b)	Discuss various learning strategies in detail.	CO1	8 Marks

UNIT-II

3.	a)	Discuss the limitations of Back propagation neural networks.	CO1	5 Marks
	b)	Explain the application of ANN in Electrical load forecasting in detail.	CO6	9 Marks
		(OR)		
4.	a)	Explain the architecture and training algorithm of back propagation neural network.	CO1	8 Marks
	b)	Discuss the Kohonen self-organizing map in brief.	CO1	6 Marks

UNIT-III

5.	a)	Contrast crisp and fuzzy sets.	CO2	6 Marks
	b)	For the following fuzzy relation find the max-min and max-product compositions. $\widetilde{R}1 = \begin{bmatrix} 0.5 & 0.4 \\ 0.7 & 0.3 \end{bmatrix}$ $\widetilde{R}2 = \begin{bmatrix} 0.6 & 0.2 & 0.4 \\ 0.2 & 0.1 & 0.5 \end{bmatrix}$	CO4	8 Marks
		(OR)		
6.	a)	Two Fuzzy sets **Ã** and **Ñ** are defined on X as follows.	CO4	9 Marks

	X1	X2	X3	X4	X5
Ã	0.9	0.2	0.3	0.1	0.8
Ñ	0.6	0.8	0.6	0.9	0.5

Find the following **α** cut sets

i) $(\tilde{A} \cap \tilde{N})_{0.2}$ ii) $(\tilde{A} \cup \tilde{N})_{0.5}$ iii) $(\tilde{A} \cap \tilde{A})_{0.8}$

	b)	What is the role of membership function in fuzzy logic? List out various methods of membership value assignment.	CO1	5 Marks

UNIT-IV

7.	a)	What is Defuzzification? Explain any one defuzzification method in detail.	CO1	7 Marks
	b)	Design the rule base for Speed control of DC motor using fuzzy logic.	CO3	7 Marks
		(OR)		
8.	a)	Discuss Centroid method of defuzzification in detail.	CO1	5 Marks
	b)	Explain the application of Fuzzy logic in speed control of DC motors.	CO6	9 Marks

UNIT-V

9.	a)	List and explain the advantages and limitations of Genetic algorithms.	CO1	7 Marks
	b)	Comprehend the encoding process of genetic algorithms.	CO1	7 Marks
		(OR)		
10.	a)	Apply Genetic algorithms for optimal allocation of capacitors in distribution system. Explain in detail.	CO5	9 Marks
	b)	Elucidate the mutation process in detail.	CO1	5 Marks

❀ ❀ ❀

CODE No.: 16BT70302 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

FINITE ELEMENT METHOD
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

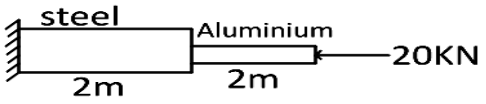
UNIT-I

1. a) Explain natural coordinate system. Derive expression for relation between natural and Cartesian coordinate systems. CO1 7 Marks

   b) Explain the significance of node numbering and element numbering during the discretization Process. CO1 7 Marks

(OR)

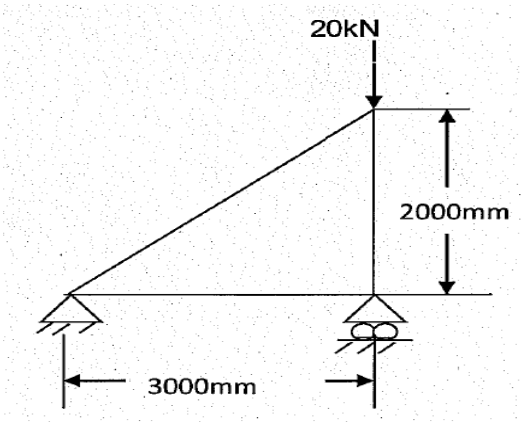
2. For the bar assemblages shown in figure, determine the nodal displacements, element stresses and support reactions. CO1 14 Marks



$E_{st}=200Gpa$
$A_{st}=4*10^{-4}m^2$
$E_{al}=70Gpa$
$A_{al}=2*10^{-4}m^2$

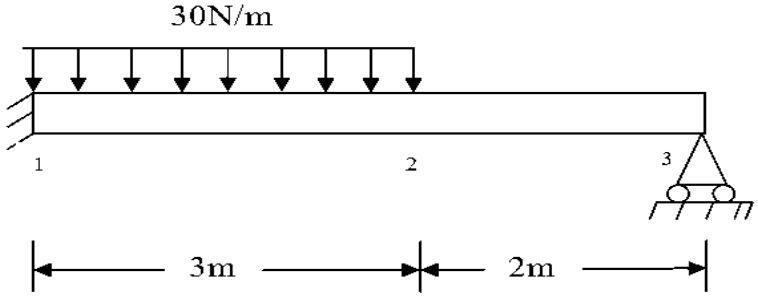
UNIT-II

3. Consider the plane truss shown in figure. Determine the nodal displacements and support reactions. Take E= 2 x 10^5N/mm^2. A=1500 mm^2. CO2 14 Marks



(OR)

4. For the loaded beam shown in figure, determine the slope and deflection at node 2 using finite element concept. Take EI=900 Nm^2. CO2 14 Marks

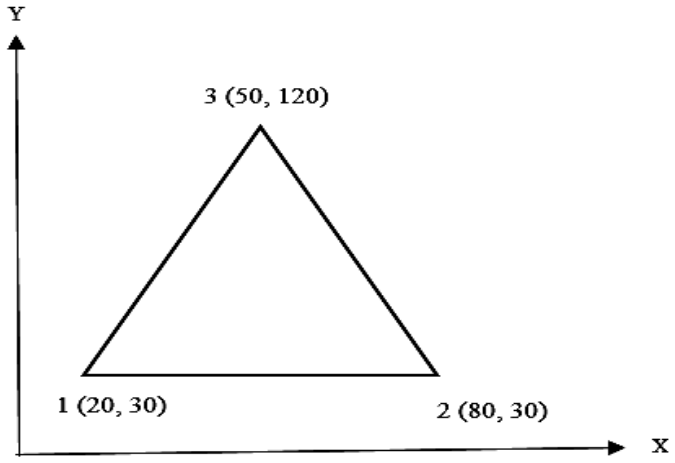


UNIT-III

5. A long cylinder of inside diameter 80 mm and outside diameter 120 mm fits in a hole over its full length. The cylinder is then subjected to an internal pressure of 2 MPa. Using 2 elements on the 10mm length, find the displacements at the inner radius. E = 200 GPa and μ = 0.3. CO3 14 Marks

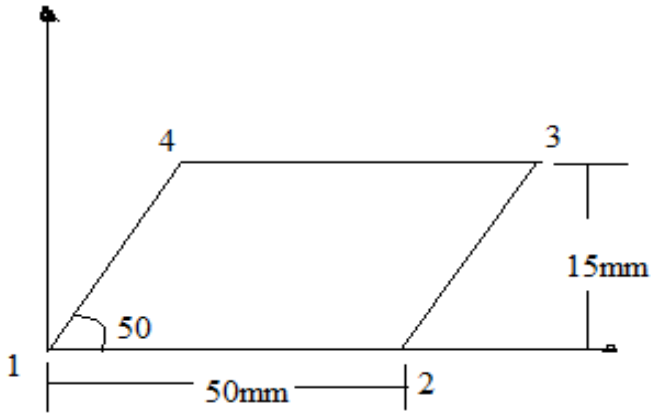
(OR)

6. Determine the stiffness matrix for the Constant Strain Triangle (CST) element shown in figure. The co-ordinates are given in mm. Assume plane stress conditions. Take Young's modulus 210 GPa, Poisson's ratio 0.25 and thickness 10mm. CO3 14 Marks



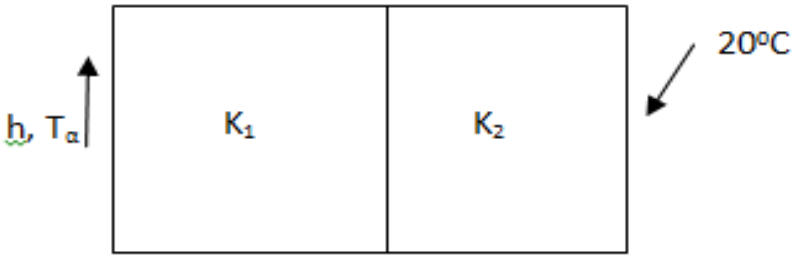
UNIT-IV

7. Consider a quadrilateral element as shown in fig the local coordinates are ξ =0.5, η = 0.5. Evaluate Jacobin matrix and strain- Displacement matrix. CO1 14 Marks



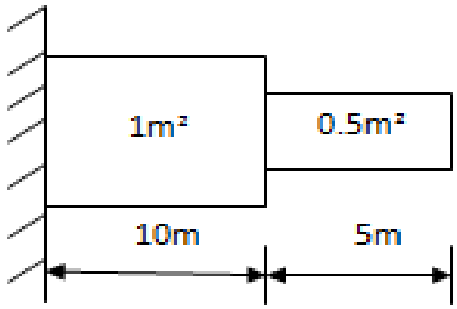
(OR)

8. Determine the temperature distribution through the composite wall shown in figure when convective heat loss occurs on the left surface. Assume unit area. Thickness t_1 = 4cm, t_2 = 2cm, K_1 = 0.5W/cm K, K_2 = 0.05W/cm K, Tα = -5^{0}C, h = 0.1 W/cm^2 K. CO4 14 Marks



UNIT-V

9. Determine the Eigen values and Eigen Vectors for the stepped bar as shown in figure. CO5 14 Marks

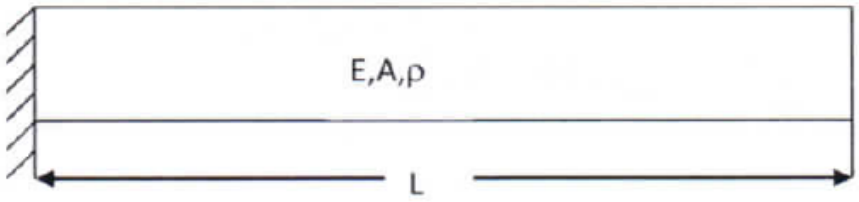


$\rho = 7850\ Kg/m^3$

$E = 30 \times 10^6\ N/m^2$

(OR)

10. Evaluate the lowest Eigen value and the corresponding Eigen modes for the beam shown in figure. E=200 GPa and ρ = 7840kg/m^3, I=2000 mm^4, A=240 mm^2, L=300mm. CO6 14 Marks



CODE No.: 16BT70303 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

OPERATIONS RESEARCH
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. Old hens can be bought for Rs. 20 each but young one costs Rs. 50 each. The old hens lay three eggs per week and young ones five eggs per week, each egg worth Rs. 3. It costs Rs. 10 per week to feed each hen. If I have only Rs. 800 to spend for purchasing hens, how many of each kind should I buy assuming that I cannot house more than 20 hens? Formulate the problem as LPP and solve using graphical method. CO1 14 Marks

(OR)

2. Solve the following problem using Big-M Method CO2 14 Marks

Maximize $\mathbf{Z = 2X_1 + 4X_2}$,

Subject to the constraints

$$\mathbf{2X_1 + X_2 \leq 18}$$
$$\mathbf{3X_1 + 2X_2 \geq 30}$$
$$\mathbf{X_1 + 2X_2 = 26}$$
$$\mathbf{X_1, X_2 \geq 0.}$$

UNIT-II

3. a) Outline the steps in Hungarian method. CO4 6 Marks

   b) Consider the problem in which two factories supply three stores with a commodity. The number of supply units available at sources 1 and 2 is 200 and 300; those demanded at stores 1, 2 and 3 are 150, 200 and 50 respectively. Units may be transshipped among the factories and the stores before reaching their final destination. Find the optimal shipping schedule based on the unit costs (Rs.) given below: CO4 8 Marks

	F1	**F2**	**S1**	**S2**	**S3**
F1	0	5	7	4	9
F2	5	0	6	2	3
S1	7	2	0	5	1
S2	2	5	1	0	4
S3	8	7	5	6	0

(OR)

4. Find the optimal solution to the following transportation problem CO3 14 Marks

		Destination				
		P	Q	R	S	Supply
Origin	A	21	16	25	13	11
	B	17	18	14	23	13
	C	32	17	18	41	19
	Demand	6	10	12	15	43

UNIT-III

5. a) What do you understand by zero - sum and non zero – sum game? What do you mean by strategy, dominance and saddle point? CO6 7 Marks

b) Solve the following game using graphical approach. CO6 7 Marks

A's Strategy	B's Strategy			
	8	5	-7	9
	-6	6	4	-2

(OR)

6. The probability distribution of the failure time of certain time of electric bulb is given below CO6 14 Marks

Week	1	2	3	4	5	6	7	8
Probability of failure	0.05	0.13	0.25	0.43	0.68	0.88	0.96	1.0

The cost of individual replacement is Rs. 4 per bulb. The cost of group replacement is Rs 1 per bulb. if there are 1000 bulbs in use find the optimal replacement policy under:

i) Individual replacement.

ii) Group replacement.

UNIT-IV

7. The following table gives the data for the activities CO5 14 Marks

Job(i-j)	1-2	1-3	2-4	2-6	3-4	3-5	4-5	5-6
Opt. time (days)	1	5	3	1	8	2	5	2
Most likely time(days)	4	10	3	4	15	4	5	5
Pessimistic time (days)	7	17	3	7	26	8	5	8

i) Draw the network and find the expected project completion time.

ii) What is the probability that it would take 5 days more than the expected duration?

iii) Find the project completion time which will have 95% confidence.

(OR)

8. For the following data, draw the network diagram, and then crash the activities to find the time cost trade-off points that company should want to consider. Start with the plan that has the longest duration. CO5 14 Marks

Activity	Preceding Activity	Time (weeks)		Cost (Rs.)	
		Normal	Crash	Normal	Crash
A	-	2	1	20000	20700
B	-	3	1	29000	33000
C	A	2	1	25000	26100
D	B	4	3	47000	47750
E	C	4	2	55000	57000
F	C	3	2	29000	29500
G	D, E	5	3	79000	80800
H	F,G	2	1	15000	17900

UNIT-V

9. a) What are the basic elements of a waiting line model? CO3 4 Marks

b) An oil company is constructing a service station on a high way. Traffic analysis indicated that customers' arrivals over most of the day would approximate a poisson distribution with a mean of 40 automobiles per hour, with that service time distribution approximating the negative exponential. If 5 pumps are installed. CO3 10 Marks

i) What is the probability that an arrival would have to wait in line?

ii) Find out the average waiting time, average time spent in the system and the average number of automobiles in the system.

(OR)

10. A dentist schedules all her patients for 30 minutes appointments. Some of the patients take more or less than 30 minutes depending on the type of dental work to be done. The following summary shows the various categories of work, their probabilities and time needed to complete the work. CO5 14 Marks

Category	Time required (Minutes)	Probability of category
Filling	45	0.4
Crown	60	0.15
Cleaning	15	0.15
Extraction	45	0.1
Checkup	15	0.2

Simulate the dentist's clinic for four hours and determine the average waiting time for the patients as well as the idleness of the doctor. Assume that all the patients show up at the clinic at exactly their scheduled arrival times, starting at 8 A.M. Use the following random numbers for handling the above problem: 40, 82, 11, 34, 25, 66, 17, 79.

CODE No.: 16BT70304 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

CRYOGENICS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What is the necessity of low temperature?	CO1	6 Marks
	b)	Explain the limitations of Vapour compression refrigeration system for low temperature applications	CO2	8 Marks
		(OR)		
2.		Discuss how a cascade system can be used to produce liquid Nitrogen.	CO2	14 Marks

UNIT-II

3.	a)	Outline thermal properties of material at cryogenic temperatures.	CO1	6 Marks
	b)	Explain super fluidity with the help of neat diagrams.	CO3	8 Marks
		(OR)		
4.	a)	Describe different molecular forms of hydrogen.	CO1	4 Marks
	b)	Discuss the properties of helium isotopes at cryogenics range.	CO3	10 Marks

UNIT-III

5.		Explain the different methods of liquefaction of air. Discuss about Claude system in detail.	CO2	14 Marks
		(OR)		
6.		Illustrate the working of a system used for the production of dry- ice. "The production of dry-ice is more difficult in hot summer compared with winter". Discuss in detail.	CO4	14 Marks

UNIT-IV

7.	a)	Write briefly on production of low temperatures.	CO1	7 Marks
	b)	Explain with proper reasoning and graph, the effect of low temperature on two mechanical and two thermal properties of engineering materials.	CO4	7 Marks
		(OR)		
8.		Write a note on low temperature properties of Engineering materials.	CO4	14 Marks

UNIT-V

9.	a)	Explain about Dewar vessels.	CO5	7 Marks
	b)	Discuss the hazards in cryogenic engineering.	CO5	7 Marks
		(OR)		
10.		List the different insulations used in cryogenic equipment and explain any two types of insulations.	CO5	14 Marks

CODE No.: 16BT70309 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

INDUSTRIAL ROBOTICS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Give the RIA definition of a Robot. Explain the important components of a Robot.	CO1	7 Marks
	b)	Distinguish electrical and hydraulic drive systems.	CO2	7 Marks
		(OR)		
2.	a)	Classify end effectors. Explain any one type of gripper in detail.	CO1	7 Marks
	b)	List out the type of grippers. Discuss about magnetic grippers.	CO1	7 Marks

UNIT-II

3.		Discuss the working principle of Servo motors. List out its advantages and disadvantages.	CO2	14 Marks
		(OR)		
4.		Point out any two methods of mechanical transmission system with their limitations.	CO2	14 Marks

UNIT-III

5.		The Coordinates of the point P on the body given by $\{1, 2, 3\}^T$. The point moved by 7 units along X axis, then rotation of 30^0 about Z axis followed by rotation of 45^0 about Y axis. Determine the new coordinates of the point P with respect to the fixed frame.	CO3	14 Marks
		(OR)		
6.		Derive Forward Kinematics solution for a 3R manipulator.	CO3	14 Marks

UNIT-IV

7.		Define trajectory planning. Write about various methods of trajectory planning.	CO1	14 Marks
		(OR)		
8.	a)	Derive the necessity of failsafe hazard sensor systems in the robots.	CO2	7 Marks
	b)	Demonstrate any two position sensors with a neat sketch.	CO5	7 Marks

UNIT-V

9.		Explain the features of AL and AML languages.	CO1	14 Marks
		(OR)		
10.		Report the applications of Modern Robots in the society. Also enumerate the challenges faced in the development.	CO6	14 Marks

CODE No.: 16BT70311 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

PRODUCTION AND OPERATIONS MANAGEMENT
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Enumerate operations Management with a block diagram	CO2	7 Marks
	b)	Write a brief note on historical development of Operations Management.	CO2	7 Marks
		(OR)		
2.	a)	Explain in brief the factors affecting Productivity.	CO3	7 Marks
	b)	Give a brief note on the significance of production systems decisions.	CO5	7 Marks

UNIT-II

3.	From the choice of simple moving average, weighted moving average, exponential smoothing and linear regression analysis, which forecasting technique would you consider the most accurate? Why?	CO3	14 Marks
	(OR)		
4.	A manufacturer of tricycles for children in the age group of two to four years commissioned a market research firm to understand the factors that influenced the demand for its product. After some detailed studies, the market research firm concluded that the demand was a simple linear function of the number of newly married couples in the city. Based on this assumption, build a causal model for forecasting the demand for the product using the data given in table collected for a residential area in a city. Also estimate the demand for tricycles if the number of new marriages is 150 and 250.	CO3	14 Marks

X	New marriages	201	236	211	198	225	240	218	226
Y	Demand for tricycles	175	194	180	165	190	172	182	170

UNIT-III

5.	Write a brief note on Chase, Level and mixed strategies for Aggregate Production Planning.	CO1	14 Marks
	(OR)		
6.	"Mixed strategies are always superior to pure strategies in an aggregate production planning exercise". Comment on this statement."	CO1	14 Marks

UNIT-IV

7.	List out the functions of CRP using block diagram and explain the function with an example.	CO1	14 Marks
	(OR)		
8.	Give the difference between MRP and MRP II and explain MRP – II with Block diagram.	CO1	14 Marks

UNIT-V

9. Explain Johnson's algorithm in Flow shop scheduling. There are 5 jobs each of which must go through 2 machines A and B in order immediately processing Times are given below. CO6 14 Marks

	J1	**J2**	**J3**	**J4**	**J5**
Time for A	5	1	9	3	10
Time for B	2	6	7	8	4

Determine the sequence for 5 jobs that will minimize, the elapsed time calculates the total idle time for machines in this Period.

(OR)

10. Consider the following flow shop scheduling problem where there are 5 jobs and 3 machines. CO6 14 Marks

Solve the following using Palmer's heuristic and CDS heuristic Technique. Find the make span of this scheduling process and also goodness of this problem with respect to Heuristic solution.

	A	**B**	**C**
J1	18	12	16
J2	10	11	14
J3	20	15	13
J4	15	19	19
J5	16	16	15

CODE No.: 16BT70312 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

POWER PLANT ENGINEERING
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Draw a neat diagram of the cyclone burner and explain its outstanding features.	CO1	7 Marks
	b)	What are the feeding systems of pulverized coal into the furnace? What are the two design conditions to be satisfied to burn pulverized coal successfully?	CO3	7 Marks
		(OR)		
2.		Describe the components and working of electrostatic precipitator dust collection in a steam power plant.	CO2	14 Marks

UNIT-II

3.	a)	Draw a neat diagram of a cooling system used for the diesel power plant.	CO1	7 Marks
	b)	What are the various factors to be considered while selecting the site for diesel engine power plant?	CO3	7 Marks
		(OR)		
4.		Identify essential components of a simple open cycle gas turbine plant. How inter cooling and regeneration help in improving the thermal efficiency of the plant?	CO4	14 Marks

UNIT-III

5.	a)	Draw the line diagram and explain the working of the pressurized water reactor.	CO1	7 Marks
	b)	Explain with neat sketch the working of gas cooled type reactor.	CO1	7 Marks
		(OR)		
6.		What is the Hydrological cycle? Discuss its significance in locating the site and design of hydroelectric power plants.	CO4	14 Marks

UNIT-IV

7.	a)	Explain the working principle of thermoelectric conversion system.	CO2	7 Marks
	b)	Describe with necessary diagrams, the principle of working of a geothermal power plant.	CO2	7 Marks
		(OR)		
8.		Classify biogas plants and explain anyone type of biogas plant with neat sketch.	CO2	14 Marks

UNIT-V

9.	a)	The yearly duration curve of a certain plant can be considered as a straight line from 150MW to 40MW. The power is supplied with one generating unit of 100MW and two units of 40MW each. Calculate installed capacity, load factor, Plant factor, utilization factor and Maximum demand.	CO6	7 Marks
	b)	Draw the load curve for the power requirement in India and discuss the methods to accomplish the part load conditions.	CO6	7 Marks

(OR)

10.	a)	Identify the impact on the environment and human health for the effluents released from the thermal power plants.	CO5	7 Marks
	b)	Discuss the harmful effects of CO_2, CO, compounds of sulphur and oxides of Nitrogen.	CO5	7 Marks

CODE No.: 16BT70401 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

CELLULAR AND MOBILE COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	List the characteristics used to specify the uniqueness of Mobile radio environment and brief about the model of transmission medium.	CO1	7 Marks
	b)	Using the concept of Frequency Reuse channels, derive the relation for Frequency Reuse distance 'D' as a function of reuse pattern and cell size.	CO2	7 Marks

(OR)

2.	a)	Illustrate various criteria used to specify the performance of a cellular system.	CO1	7 Marks
	b)	Define Co-channel Interference and derive the relation for Co-channel Interference factor in a cell with its k^{th} Co-channel Interfering cell.	CO2	7 Marks

UNIT-II

3.	a)	Classify and describe about various adjacent channel Interference mechanisms.	CO1	7 Marks
	b)	What is Diversity receiver? Illustrate how diversity receiver can be used to improve performance of the system even in low transmitted power levels.	CO6	7 Marks

(OR)

4.	a)	Summarize about Umbrella pattern effect and List the benefits of Umbrella pattern.	CO1	7 Marks
	b)	Illustrate how cell site location, decrease in power and Antenna height effect coverage and interference problems.	CO4	7 Marks

UNIT-III

5.	a)	Define Ground Incident angle and Ground elevation angle.	CO1	6 Marks
	b)	In a mobile radio environment, if average cell site antenna height is 50m, Mobile antenna height is 3m and Path length is 5km, Find; i) Incident angle. ii) Elevation angle.	CO3	8 Marks

(OR)

6.	a)	Give reason behind using 1-mi intercept in finding path-loss curves.	CO6	6 Marks
	b)	In a mobile radio environment, if average cell site antenna height is 50m, Mobile antenna height is 3m and Path length is 5km and Height of mountain on which base station is erected H=100m. Compare i) Ground Incident angle. ii) Reflection Point obtained from accurate and approximate methods.	CO3	8 Marks

UNIT-IV

7.	a)	Analyze how adjacent channel and Co-channel interference can be controlled using Underlay-overlay arrangement.	CO4	7 Marks
	b)	Differentiate Soft handoff and Hard handoff. Conclude the usage of Soft handoffs in CDMA systems.	CO5	7 Marks

(OR)

8.	a)	Outline various methods used to solve the problem of channel assignment to travelling mobile units.	CO4	7 Marks
	b)	Identify the handoff algorithm which is more appropriate during unavailability of free channels when crossing a cell boundary.	CO5	7 Marks

UNIT-V

9.	a)	Draw OSI model of GSM architecture and explain.	CO1	7 Marks
	b)	Differentiate physical layer of WCDMA-FDD and WCDMA-TDD standards.	CO6	7 Marks

(OR)

10.	a)	Differentiate three standard 3G systems. Also mention the features of 3G standard systems.	CO6	7 Marks
	b)	Define Authentication and explain about Authentication of MS data bursts.	CO1	7 Marks

CODE No.: 16BT70402 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

EMBEDDED SYSTEMS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss memory classification in a typical embedded system.	CO3	7 Marks
	b)	Review various functional blocks in MSP430.	CO1	7 Marks
		(OR)		
2.	a)	Generalize the characteristics of a typical Embedded system.	CO1	7 Marks
	b)	Interpret with an example embedded system where MSP430X can fit.	CO3	7 Marks

UNIT-II

3.	a)	Discuss MSP430 instructions which can be used to control program flow.	CO5	7 Marks
	b)	Explore conditions of MSP430 after reset.	CO2	7 Marks
		(OR)		
4.	a)	Discuss various shift and rotate instructions possible in assembly programming.	CO5	7 Marks
	b)	Give out example instructions for binary arithmetic instructions with two operands.	CO2	7 Marks

UNIT-III

5.	a)	Interrupts are like functions that are called by hardware rather than software – support the statement with suitable reasoning.	CO6	7 Marks
	b)	Paraphrase the importance of interrupts and issues associated while describing Interrupt service routines.	CO5	7 Marks
		(OR)		
6.	a)	Demonstrate passing parameters and returning results using subroutines with suitable example.	CO6	7 Marks
	b)	Distinguish the similarities and dissimilarities with reference to ISR (Interrupt Service Routine) to a subroutine.	CO5	7 Marks

UNIT-IV

7.	a)	Discuss various modes of operation of USCI-A.	CO1	7 Marks
	b)	Compose configuring Real Time Clock and associate control register to handle interrupt from basic timer 1.	CO3	7 Marks
		(OR)		
8.	a)	Paraphrase the Architecture and operation of ADC10 in MSP430.	CO1	7 Marks
	b)	Develop mechanism to measure charging and discharging times of RC circuit using comparator_A and timer 2.	CO3	7 Marks

UNIT-V

9.	a)	Explore architectural models suitable for synthesis of co-design models.	CO2	7 Marks
	b)	List various technical communication models suitable for IOT implementation.	CO4	7 Marks
		(OR)		
10.	a)	Define Model. List the qualities a good model should process.	CO1	7 Marks
	b)	IPV6 has made the ground ready for IOT to take on – discuss the issue with an eye on IPV4 limitations.	CO4	7 Marks

CODE No.: 16BT70403 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

MICROWAVE ENGINEERING
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Using principle of faraday rotation, explain the action of Circulator.	CO5	7 Marks
	b)	An isolator has an insertion loss of 0.5dB and an isolation of 30dB. Determine the scattering matrix of the isolator if the isolated ports are perfectly matched to the junction.	CO4	7 Marks
		(OR)		
2.	a)	Using principle of faraday rotation, Explain the working of ferrite isolator.	CO5	7 Marks
	b)	A signal of power 32mw is fed into one of the collinear ports of a lossless H-plane Tee. Determine the powers in the remaining ports when other ports are terminated by means of matched loads.	CO4	7 Marks

UNIT-II

3.	a)	Derive the expressions for output power and efficiency of a two-cavity Klystron Amplifier.	CO2	7 Marks
	b)	Justify the role of Magnetron in microwave communication system.	CO6	7 Marks
		(OR)		
4.	a)	What is a slow wave structure? Explain different types of slow wave structures used in microwave tubes.	CO1	7 Marks
	b)	Identify a microwave device which has a theoretical efficiency of 27.78% in amplification process. Explain the same.	CO6	7 Marks

UNIT-III

5.	a)	Develop a Gunn diode using N-type GaAs Specimen and explain its operation.	CO3	7 Marks
	b)	Draw the characteristics of TRAPATT diode and show how its exhibits negative resistance.	CO2	7 Marks
		(OR)		
6.	a)	Compare working principle of Avalanche and Transferred electron devices.	CO2	7 Marks
	b)	Develop the construction of IMPATT diode and explain its operation.	CO3	7 Marks

UNIT-IV

7.	a)	Draw the block diagram of microwave bench set up and explain each block in detail.	CO1	7 Marks
	b)	In a microwave power measurement set up, the microwave pulse had an average power of 250W and a duration of 5μ Sec. If the time interval between pulses are measured as 2m/sec, determine the value of the peak power.	CO4	7 Marks
		(OR)		
8.	a)	Draw the bench setup for measuring low VSWR and explain its operation.	CO1	7 Marks
	b)	Build a bench setup for measuring Attenuation using RF substitution method.	CO3	7 Marks

UNIT-V

9.	a)	Explain the terms : i) Ray path. ii) Critical frequency. iii) Lowest usable frequency.	CO1	8 Marks
	b)	Calculate the skip distance for flat earth with MUF of 10 MHz if the wave is reflected from a height of 300km where the maximum value of 'n' is 0.9.	CO4	6 Marks
		(OR)		
10.	a)	Describe any two types of fading normally encountered in radio wave propagation.	CO1	8 Marks
	b)	Derive the relation between Maximum Usable Frequency and skip distance assuming the earth is flat.	CO2	6 Marks

CODE No.: 16BT70407 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

WIRELESS COMMUNICATION AND NETWORKS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain in detail about Frequency Division Multiple Access with neat block diagram.	CO1	7 Marks
	b)	If a normal GSM time slot consists of six training bits, 8.25 guard bits, 26 training bits and two traffic bursts of 58 bits of data, find the frame efficiency.	CO4	7 Marks
		(OR)		
2.	a)	Justify how the common channel signaling is advantageous over conventional signaling in enhancing bandwidth.	CO4	8 Marks
	b)	List the services offered by the SS7 network.	CO1	6 Marks

UNIT-II

3.	a)	Discuss about WML scripts.	CO1	7 Marks
	b)	Analyze the protocols used for registration in mobile IP.	CO2	7 Marks
		(OR)		
4.	a)	Explain the steps involved in operation of mobile IP.	CO1	6 Marks
	b)	Demonstrate data transfer process in wireless network. i) From a mobile node to a fixed node vice-versa. ii) From a mobile node at foreign location to other mobile node at foreign location.	CO2	8 Marks

UNIT-III

5.	a)	Draw the protocol architecture of IEEE 802 and extend it to different protocols.	CO6	7 Marks
	b)	Write a short note on Microwave LANS.	CO1	7 Marks
		(OR)		
6.	a)	Discuss about the protocols used in WLAN.	CO1	6 Marks
	b)	Draw the configuration of IEEE 802.11. Explain.	CO6	8 Marks

UNIT-IV

7.	a)	Develop a Wireless Local Loop network to provide data and voice services to its users.	CO3	8 Marks
	b)	Write the functions of Link manager specification Layer in Bluetooth.	CO1	6 Marks
		(OR)		
8.	a)	Draw the packet formats of LLCAP protocol of Bluetooth.	CO1	7 Marks
	b)	Develop an algorithm to build a sync word in Bluetooth.	CO3	7 Marks

UNIT-V

9.	a)	Draw and explain the general structure of an ATM switch.	CO1	7 Marks
	b)	Identify appropriate functionalities of Wireless ATM and write its Services.	CO5	7 Marks
		(OR)		
10.	a)	Explain about forward channel and reverse channel in CDPD physical layer.	CO1	7 Marks
	b)	Apply overlay technology to a wireless network and illustrate the operation of GPRS.	CO5	7 Marks

❀ ❀ ❀

CODE No.: 16BT70408 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

LOW POWER CMOS VLSI DESIGN

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Organize the different sources of power dissipation in digital CMOS circuit.	CO1	7 Marks
	b)	Illustrate the constraints on Vt reduction which is used to minimize dynamic power dissipation.	CO6	7 Marks
		(OR)		
2.	a)	Write an explanatory notes on physics of power dissipation in MOSFET Devices.	CO1	7 Marks
	b)	Appraise the technology and device innovations for novel high speed low power VLSI devices.	CO6	7 Marks

UNIT-II

3.	a)	Evaluate the modeling and analysis of a transistor using SPICE.	CO2	7 Marks
	b)	From experience, the standard deviation of the power samples measured from a circuit has been observed to have ±10% fluctuation from the mean. How many samples are required so that we are 95% confidence that the error of sample mean is within ±10%?	CO4	7 Marks
		(OR)		
4.	a)	Illustrate the advantages and disadvantages of SPICE power analysis.	CO2	7 Marks
	b)	From experience, the standard deviation of the power samples measured from a circuit has been observed to have ±20% fluctuation from the mean. How many samples are required so that we are 99% confidence that the error of sample mean is within ±5%?	CO4	7 Marks

UNIT-III

5.	a)	Design and explain pre computation logic with an example.	CO3	7 Marks
	b)	Justify, in detail about Adjustable Device threshold Voltage with its applications.	CO6	7 Marks
		(OR)		
6.	a)	Design a differential latch for high speed low power application and discuss its functionality.	CO3	7 Marks
	b)	Discuss Bus invert encoding to achieve low power with relevant equations.	CO2	7 Marks

UNIT-IV

7.	a)	Write the limitations of low swing bus technique.	CO5	7 Marks
	b)	Discuss the methods to improve speed in memory.	CO4	7 Marks
		(OR)		
8.	a)	Develop Low Power Techniques for SRAM.	CO5	7 Marks
	b)	How to limit bit line swing in SRAM explain with neat sketch.	CO4	7 Marks

UNIT-V

9.	a)	Explain the basic principles to update the filter order length in digital filters.	CO1	7 Marks
	b)	Categorize the Power dissipation of uniprocessing and parallel processing systems.	CO2	7 Marks
		(OR)		
10.	a)	Explain the Switching Activity Reduction with examples.	CO1	7 Marks
	b)	Compose the method of Charge sharing for half swing with its neat sketches	CO4	7 Marks

CODE No.: 16BT70410 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

SPEECH PROCESSING

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) A commonly used approximation to glottal pulse is $g(n) = \begin{cases} na^n & n \geq 0 \\ 0 & otherwise \end{cases}$ CO2 7 Marks

   i) Find the Z transform of $g(n)$ and sketch its fourier transform.

   b) With a Schematic diagram of the vocal apparatus, explain the mechanism of speech production. CO1 7 Marks

(OR)

2. a) What are the types of phonemes in American English? Explain about anyone with an example. CO1 8 Marks

   b) Show how 'a' should be chosen so that CO2 6 Marks

   $20 \log|G(ej0)| - 20 \log|G(ej\pi)| = 60dB$

UNIT-II

3. a) State and prove the following properties of short time auto correlation function, CO4 8 Marks

   i) $R_n(k) = R_n(-k)$ ii) $R_n(k) \leq R_n(0)$.

   b) Define short time average magnitude difference function and contrast with autocorrelation function. CO1 6 Marks

(OR)

4. a) How pitch, energy and average magnitude function of a speech signal are extracted? Bring out the features of these parameters that will help us to build an automatic speech recognition system. CO2 7 Marks

   b) What is autocorrelation and state some of the properties. CO1 7 Marks

UNIT-III

5. a) Consider all pole model for the combined vocal tract, glottal pulse and radiation system of the form $H(Z) = \frac{G}{1 - \sum_{K=1}^{P} A_K Z^{-K}}$. CO4 7 Marks

   Obtain The Recursion Relation Between The Complex Cepstrum Of $H(n)$ and $\{\alpha_K\}$.

   b) Discuss the properties of complex cepstrum. CO2 7 Marks

(OR)

6. a) Estimate magnitude and phase spectrum of homomorphic filter for a voiced speech signal. CO2 7 Marks

   b) Demonstrate practical implementation of system for obtaining complex cepstrum. CO4 7 Marks

UNIT-IV

7.	a)	Explain in detail how to solve LPC equations using Cholesky decomposition method.	CO3	7 Marks
	b)	Explain how to tract the formants using LPC.	CO5	7 Marks

(OR)

8.	a)	Discuss the Durbin's recursive method and Cholesky decomposition method used for estimating and obtaining LPC of a speech signal.	CO3	8 Marks
	b)	Determine speech segment and the limits on the prediction error summation using covariance method.	CO5	6 Marks

UNIT-V

9.	a)	Derive the decision rule which minimizes the probability of error for identifying the speaker	CO6	8 Marks
	b)	Compare and contrast between Speaker Verification vs. recognition.	CO2	6 Marks

(OR)

10.	a)	Draw the block diagram of a speaker identification system and Explain its features.	CO1	8 Marks
	b)	Discuss briefly about basic pattern recognition approaches in the speech recognition system.	CO1	6 Marks

CODE No.: 16BT70501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

BIG DATA ANALYTICS

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What are the kinds of Data Elements in Big data? Explain with the suitable examples for each.	CO1	7 Marks
	b)	What is Standardizing data? List the different procedures of Standardization.	CO1	7 Marks
		(OR)		
2.	a)	What is Missing Values? Explain the popular schemes deal with the Missing Values.	CO1	7 Marks
	b)	Define Big data and Explain the 4 V's Big Data characteristics in brief.	CO1	7 Marks

UNIT-II

3.	a)	Interpret the Hadoop Framework and explain the basic building blocks of Hadoop with suitable architecture diagram.	CO3	7 Marks
	b)	Sketch and discuss about Master/Slave method in HDFS architecture.	CO3	7 Marks
		(OR)		
4.	a)	Describe about the Hadoop Ecosystem and explain the various components of Hadoop Ecosystem.	CO2	10 Marks
	b)	What is replication factor in HDFS define about the default value.	CO1	4 Marks

UNIT-III

5.	a)	Demonstrate the working of Job Tracker and Task Tracker in the Classic Mapreduce 1.	CO3	7 Marks
	b)	Interpret the basic anatomy of Map Reduce and demonstrate about the YARN architecture Map reduces.	CO3	7 Marks
		(OR)		
6.	a)	Differentiate the Map-Reduce Implementation between the Word counts, Write Types of keys and Values mapper, Reducer, Combiner with examples.	CO4	7 Marks
	b)	Define the following Scheduler: i) FIFO Scheduler ii) Capacity Scheduler.	CO1	7 Marks

UNIT-IV

7.	a)	Appraise any Four HiveQL DDL command with its syntax and explain with examples.	CO5	7 Marks
	b)	Select and explain the proper steps of the working principle of Hive architecture along with the suitable diagram.	CO5	7 Marks
		(OR)		
8.	a)	Describe the components of Pig Execution Environment.	CO2	7 Marks
	b)	Discuss about the various data types supported by Pig in its data model with an example.	CO2	7 Marks

UNIT-V

9.	a)	Design Hadoop data flow architecture at Rackspace.	CO6	7 Marks
	b)	Investigate the case studies of Mahout and Sqoop in detail.	CO6	7 Marks
		(OR)		
10.	a)	Sketch and explain the Data warehousing architecture at Facebook.	CO6	7 Marks
	b)	Investigate the case studies of Crunch and Spark in detail.	CO6	7 Marks

CODE No.: 16BT70505 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

HUMAN COMPUTER INTERACTION

[Computer Science and Engineering, Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	List and explain the set of principles guided the design of Xerox STAR.	CO3	7 Marks
	b)	Explain the characteristics of a web interface in detail.	CO2	7 Marks
		(OR)		
2.	a)	Differentiate the characteristics of internet and intranet with brief explanation.	CO2	7 Marks
	b)	Briefly explain the concept of direct manipulation.	CO1	7 Marks

UNIT-II

3.	a)	How to determine the requirements of a user?	CO2	10 Marks
	b)	Define Business.	CO1	4 Marks
		(OR)		
4.	a)	Explain how to conduct a Face-to-Face interview for requirement analysis.	CO4	7 Marks
	b)	Describe the process of understanding the User's mental model.	CO2	7 Marks

UNIT-III

5.	a)	Classify various types of statistical graphics.	CO1	6 Marks
	b)	Explain any four qualities which provide visually pleasing composition.	CO1	8 Marks
		(OR)		
6.	a)	What is a Screen? What is the purpose of a screen?	CO1	4 Marks
	b)	Elaborate the steps for organizing and ordering of screen elements.	CO2	10 Marks

UNIT-IV

7.	a)	Explain the procedure for choosing colors in screen design.	CO2	7 Marks
	b)	Predict what are the possible problems with color.	CO5	7 Marks
		(OR)		
8.	a)	Define an icon. Describe different kinds of icons in detail.	CO1	6 Marks
	b)	Articulate the good icon design guide lines in detail.	CO3	8 Marks

UNIT-V

9.	a)	How speech-based interface design helps the disabled people? Explain	CO6	7 Marks
	b)	Explain the Indirect pointing devices and drivers.	CO2	7 Marks
		(OR)		
10.	a)	Explain the criterion for finding the right interface building tools.	CO5	7 Marks
	b)	Explain the features interface building tools.	CO2	7 Marks

CODE No.: 16BT71001 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

ANALYTICAL INSTRUMENTATION

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Classify the electrodes used in liquid and gas analyzers and explain their working in detail.	CO1	7 Marks
	b)	Brief the effect of temperature on conductivity measurement.	CO1	7 Marks
		(OR)		
2.	a)	"Sodium analyzer places a vital role in treatment of boiler feed water" justify.	CO2	7 Marks
	b)	Write a short note on silica analyzer.	CO1	7 Marks

UNIT-II

3.	a)	Explain how beer Lambert's law is implemented analysis of chemical solution by using spectrometers.	CO5	10 Marks
	b)	Explain the light sources used in spectrometers.	CO1	4 Marks
		(OR)		
4.	a)	Differentiate single and double beam colorimeters.	CO2	7 Marks
	b)	Recall the working of FT IR spectrometers.	CO1	7 Marks

UNIT-III

5.	a)	Elaborate the appropriate spectroscopic technique which is used to analyze chemical solution by using atomic emission as the key factor.	CO4	7 Marks
	b)	Describe the different types of burners used in flame photometers.	CO1	7 Marks
		(OR)		
6.	a)	Compare magnetic deflection and time of flight mass spectrometer.	CO2	7 Marks
	b)	Select an appropriate spectroscopic technique to analyze given chemical sample by using magnetic resonance phenomenon.	CO4	7 Marks

UNIT-IV

7.	a)	Explain how gaschromatography provides valid solution by analyzing the given sample.	CO3	7 Marks
	b)	List the columns used in liquid chromatography and explain its importance in the analysis of chemical solution.	CO1	7 Marks
		(OR)		
8.	a)	With neat sketch, explain fluorescence detector in detail.	CO1	7 Marks
	b)	Classify gaschromatography and explain the importance of oven thermostats in gaschromatography.	CO1	7 Marks

UNIT-V

9.	a)	With a neat sketch, explain the working of NO_X monitor.	CO1	7 Marks
	b)	Justify the role environment pollution monitoring device in the day to day life in the society.	CO6	7 Marks
		(OR)		
10.	a)	Explain the necessity of X- ray detectors in day today life.	CO6	7 Marks
	b)	With a neat sketch, explain the working of Turbidity and Nephelometer.	CO1	7 Marks

CODE No.: 16BT71002 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

BIOMEDICAL SIGNAL PROCESSING
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		What is the need of Biomedical signal processing and explain the process with a neat block diagram and explain each block in detail?	CO1	14 Marks
		(OR)		
2.		Sketch the diagram of Computer Aided Diagnosis based upon the biomedical signal analysis.	CO1	14 Marks

UNIT-II

3.		What are the potential sources of instrumentation and physiological artifacts in recording the Biomedical signal? Propose non-electronic methods to prevent or suppress the latter type of artifacts.	CO2	14 Marks
		(OR)		
4.		Explain about the following. i) Time and frequency domain filtering. ii) Homomorphism filtering.	CO2	14 Marks

UNIT-III

5.	a)	Design an adaptive filter using LMS algorithm.	CO3	7 Marks
	b)	Write the differences between static filter and adaptive filter and explain the principle of an adaptive filter.	CO3	7 Marks
		(OR)		
6.		Explain the significance in Phase Sensitive detector in biomedical signal processing and explain its operation with neat sketch.	CO3	14 Marks

UNIT-IV

7.		Write short notes on: i) Detection of Dicrotic notch. ii) Correlation Analysis of EEG channels.	CO4	14 Marks
		(OR)		
8.		Describe the turning point algorithms for ECG data compression in terms of data reduction with suitable figures and its disadvantages.	CO5	14 Marks

UNIT-V

9.		Explain the following terms. i) Direct FFT. ii) Window functions.	CO6	14 Marks
		(OR)		
10.		Write a note on spectral estimation in biomedical signals. Explain the types of power spectrum estimation.	CO6	14 Marks

❀ ❀ ❀

CODE No.: 16BT71003 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

INDUSTRIAL AUTOMATION
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	With reference to the PLC discrete input modules, what types of field input devices are suitable for use with them?	CO2	7 Marks
	b)	Compare the functions of the CPU and memory sections of a PLC processor.	CO2	7 Marks

(OR)

2.	a)	There are three machines, each with its own start-stop buttons. Only one may run at a time. Construct a circuit with appropriate interlocking.	CO3	7 Marks
	b)	Asses FAIL-SAFE circuits in PLC. Which PLC may be appropriate? Provide justifications for your choice.	CO5	7 Marks

UNIT-II

3.		Explain about PLC counter and timer operation in a single application.	CO1	14 Marks

(OR)

4.		Select a Suitable PLC for develop a sequencer control system to operate a basic robot.	CO5	14 Marks

UNIT-III

5.		Explain how Token ring and Token Bus Communication Topology for transmit data in Distributed Control Systems.	CO1	14 Marks

(OR)

6.	a)	Illustrate about DCS Integration with PLCs and Computers with an example.	CO1	7 Marks
	b)	Describe in detail about DCS supervisory computer tasks.	CO1	7 Marks

UNIT-IV

7.	a)	Describe about how MTU message calls for Analog Output of particular register.	CO1	7 Marks
	b)	Describe about SCADA Analog Output Card with neat diagram.	CO1	7 Marks

(OR)

8.		Inexpensive memory has led more and more information to be stored in the MTU. What technology may turn that trend around? Why?	CO2	14 Marks

UNIT-V

9.	a)	Illustrate about how HART protocol utilizes the OSI reference model.	CO1	7 Marks
	b)	Explain about basic requirements of field bus standard for Local Area Network of industrial automation field.	CO1	7 Marks

(OR)

10.		Describe in detail about field bus. i) interoperability. ii) interchangeability.	CO1	14 Marks

CODE No.: 16BT71009 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

POWER PLANT INSTRUMENTATION

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the wind power generation with the help of block diagram in detail.	CO1	7 Marks
	b)	Explain the difference between conventional and non conventional sources.	CO2	7 Marks
		(OR)		
2.	a)	With neat sketch, describe the process of electric power generation using solar energy.	CO1	7 Marks
	b)	Emphasize the objectives of instrumentation and control in power generation.	CO2	7 Marks

UNIT-II

3.	a)	Illustrate the schematic diagram and explain the operations of pressurized water nuclear reactor boiling water reactor.	CO1	9 Marks
	b)	Justify how the differential pressure method is used for drum level measurement	CO2	5 Marks
		(OR)		
4.	a)	Design a measurement system setup to measure steam pressure and steam temperature.	CO3	7 Marks
	b)	Select a suitable circuit to measure flue gas presents in boiler and explain its working principle.	CO5	7 Marks

UNIT-III

5.	a)	Describe Cascade steam temperature control with neat sketch,	CO1	6 Marks
	b)	Name and explain the different methods used for controlling superheated steam temperature.	CO1	8 Marks
		(OR)		
6.	a)	Explain an engineering solution to control the combustion for solid fuel fired boiler.	CO4	7 Marks
	b)	Design a controller to control Fire side steam temperature and Steam pressure.	CO3	7 Marks

UNIT-IV

7.	a)	With neat block diagram, explain the principle parts of steam turbine.	CO1	7 Marks
	b)	Design a system to measure mechanical parameters in the measurement of turbine in power plants.	CO3	7 Marks
		(OR)		
8.	a)	Illustrate the schematic diagram of turbo alternator cooling system and describe briefly .	CO1	7 Marks
	b)	Emphasize the safety measures in controlling the turbine control system.	CO6	7 Marks

UNIT-V

9.	a)	Specify the importance of electrical safety and maintenance of measuring instruments in power plants.	CO6	7 Marks
	b)	Write short notes on explosion hazards and intrinsic safety	CO1	7 Marks
		(OR)		
10.		Discuss in detail about interlocks for boiler operation.	CO1	14 Marks

❀ ❀ ❀

CODE No.: 16BT71201 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

BIG DATA TECHNOLOGIES
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	Define Big Data. Illustrate major dimensions of Big Data.	CO1	7 Marks
	b)	Explain Hadoop distributed file system with suitable example.	CO1	7 Marks
		(OR)		
2.	a)	What is Hadoop? Categorize the components of Hadoop Ecosystem.	CO1 CO2	7 Marks
	b)	Illustrate Various Big Data Sources.	CO	7 Marks
		UNIT-II		
3.		Describe HDFS Architecture with Examples.	CO2	14 Marks
		(OR)		
4.	a)	List and explain HDFS features.	CO2	7 Marks
	b)	Explain Hadoop Input / Output procedures.	CO1	7 Marks
		UNIT-III		
5.	a)	Categorize MapReduce Library Classes.	CO2	8 Marks
	b)	Explain various tools supported by Hadoop Framework.	CO6	6 Marks
		(OR)		
6.		Explain how to create Name node and Data node of Hadoop Cluster in Hadoop Framework.	CO4	14 Marks
		UNIT-IV		
7.	a)	Distinguish between HIVE and Traditional Databases.	CO2	7 Marks
	b)	Compare and contrast HBase with RDBMS.	CO2	7 Marks
		(OR)		
8.		Elaborate installation and services of Hive.	CO5 CO6	14 Marks
		UNIT-V		
9.		Outline features and services of SQOOP in detail.	CO2 CO5	14 Marks
		(OR)		
10.	a)	Elaborate procedure to creating Facebook Database in Hive environment.	CO5 CO5	7 Marks
	b)	Explain Pig and Wukong to explore Billion-edge Network Graphs.	CO1 CO5	7 Marks

CODE No.: 16BT71202 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

MOBILE APPLICATION DEVELOPMENT
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the mobile web presence briefly.	CO1	7 Marks
	b)	Explain the reasons to create a mobile application.	CO1	7 Marks
		(OR)		
2.	a)	Compare any two mobile OSs and explain the behavior of mobile user web browsing.	CO1	7 Marks
	b)	What is Android and explain its features.	CO1	7 Marks

UNIT-II

3.	a)	Sketch the life cycle of an Activity and discuss its events.	CO1	7 Marks
	b)	Develop an android program to illustrate the usage of all events of an activity.	CO3	7 Marks
		(OR)		
4.		Create an Android application to add action items to the action bar.	CO4	14 Marks

UNIT-III

5.	a)	Create an Android application to display the long list of items which are stored in an xml file using ListView.	CO4	7 Marks
	b)	List and explain the different views for displaying images.	CO1	7 Marks
		(OR)		
6.	a)	Develop an Android program to perform image transition using ImageSwitcher View.	CO3	9 Marks
	b)	Distinguish different ways to save and load of User Preferences.	CO2	5 Marks

UNIT-IV

7.	a)	Create an Android application to send SMS message using Intent class.	CO6	7 Marks
	b)	Develop an Android program to zoom in or zoom out of the Google Map.	CO3	7 Marks
		(OR)		
8.	a)	Discuss the procedure to prevent the standard messaging application from receiving a SMS message.	CO1	7 Marks
	b)	Create an Android application to send an e-mail.	CO6	7 Marks

UNIT-V

9.	a)	Discuss the tools required to develop the applications for an Ios.	CO5	7 Marks
	b)	Define Service and discuss the functionality a Service with a suitable example.	CO1	7 Marks
		(OR)		
10.	a)	Outline the anatomy of an iOS app.	CO1	7 Marks
	b)	Develop an Android program to start a counter from zero and stop the counter using Runnable, Thread and AsyncTask.	CO3	7 Marks

CODE No.: 16BT71203 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

INFORMATION RETRIEVAL SYSTEMS
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Distinguish the following: i) IRS and DBMS. ii) IRS and Digital Libraries. iii) IRS and Data Warehouses.	CO2	7 Marks
	b)	Define Term Masking. Explain the fixed and variable term masking approaches with a suitable example.	CO1	7 Marks
		(OR)		
2.		List the various search capabilities to map the user's information needed and the items in the IRS.	CO1	14 Marks

UNIT-II

3.	a)	Explain about item receipt.	CO1	5 Marks
	b)	Model the stemming process using Dictionary look-up stemmer.	CO3	9 Marks
		(OR)		
4.		Explain the following. i) Entity Processing. ii) Categorization.	CO1	14 Marks

UNIT-III

5.	a)	Explain the use of Hidden Markov Model in information search.	CO4	7 Marks
	b)	Explain the functionality of Cliques clustering technique with an algorithm.	CO2	7 Marks
		(OR)		
6.		List various automatic term clustering techniques with an example.	CO2	14 Marks

UNIT-IV

7.		Demonstrate human perception and presentation.	CO1	14 Marks
		(OR)		
8.	a)	List the aspects of Visualization process.	CO1	5 Marks
	b)	Summarize multimedia presentation	CO1	9 Marks

UNIT-V

9.		Use the Boyer-Moore algorithm to search for the term ***FANCY*** in the string ***FANCIFUL FANNY FRUIT FILLED MY FANCY.***	CO5	14 Marks
		(OR)		
10.		Trade off the use of hardware versus software text search algorithms citing advantages and disadvantages of each in comparison to the other.	CO2	14 Marks

CODE No.: 16BT71204 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

MOBILE COMPUTING

[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the limitations of Mobile computing.	CO1	7 Marks
	b)	What are the various constraints of mobile computing?	CO1	7 Marks
		(OR)		
2.	a)	Explain security services offered by GSM with relevant Algorithms.	CO1	7 Marks
	b)	List the features of WiMAX.	CO5	7 Marks

UNIT-II

3.	a)	Differentiate Packet reservation multiple access with Demand assigned multiple access methods.	CO2	7 Marks
	b)	Assume senders A and B, want to send data. CDMA assigns the following key sequences: key AK = 010011, key BK = 110101. Sender A want to send the bit AD=1, sender B sends BD=0. A noise is added to the transmitted signal (-2,0,0,-2,+2,0). Apply CDMA concept to transfer data by assuming binary 0 as -1 and binary 1 as+1.	CO3	7 Marks
		(OR)		
4.	a)	What is a MAC layer of Bluetooth? Explain in detail.	CO1	7 Marks
	b)	Demonstrate Protocol Architecture and bridging of IEEE 802.11 WLAN.	CO4	7 Marks

UNIT-III

5.	a)	Explain the working of Mobile IP with the help of neat diagram.	CO4	7 Marks
	b)	Elaborate the creation Mobile IP along with basic requirements.	CO4	7 Marks
		(OR)		
6.	a)	Examine the reason why congestion occurs in network. Analyze how does TCP detect and handle congestion.	CO2	7 Marks
	b)	Modify Normal TCP to M-TCP for working Efficiently in wireless mobile networks.	CO5	7 Marks

UNIT-IV

7.	a)	What are the hoarding techniques and explain in detail.	CO1	6 Marks
	b)	Explain the concepts of Cache Invalidation mechanisms and what is importance of data cache maintenance and web cache maintenance?	CO1	8 Marks
		(OR)		
8.	a)	What is meant by balanced Push-Pull mechanism? In detail explain about IPP.	CO1	7 Marks
	b)	The push based broadcast is not suitable for large data size. Justify.	CO4	4 Marks
	c)	Which type of indexing is suitable for broad casting data through wireless Channel, why?	CO2	3 Marks

UNIT-V

9.	a)	How does dynamic source routing handle routing? What is the motivation behind dynamic source routing compared to other routing algorithms in fixed networks?	CO1	7 Marks
	b)	What are the security threats to a MANET? Why a MANET faces grater security threats than a fixed infrastructure networks?	CO1	7 Marks

(OR)

10.	a)	Name mechanisms to improve web access for handheld devices. What is their common problem and what led finally to the development of WAP?	CO1	7 Marks
	b)	Explain briefly about the Wireless Datagram Protocol (WDP) of transport layer.	CO1	7 Marks

CODE No.: 16BT71205 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

CRYPTOGRAPHY AND NETWORK SECURITY
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	"Exact realization of a symmetric Block cipher depends on the choice of certain parameters and design features" What are they? Explain.	CO2	7 Marks
	b)	Compute the cipher text for the message "**cryptography and network security**" using transposition technique with the key 4 3 1 2 5 6.	CO4	7 Marks
		(OR)		
2.	a)	Explain active and passive network security threats.	CO1	7 Marks
	b)	Define Caesar cipher. Discuss the characteristics of it that help the cryptanalyst using Brute-force attack.	CO2	7 Marks

UNIT-II

3.	a)	State the purpose of the S-boxes in DES.	CO1	7 Marks
	b)	Distinguish between a block cipher and a stream cipher.	CO2	7 Marks
		(OR)		
4.	a)	Write the difference between diffusion and confusion.	CO2	7 Marks
	b)	List and explain the approaches to attack the RSA algorithm.	CO2	7 Marks

UNIT-III

5.	a)	Compare and contrast the positive and negative aspects of ITA 2000.	CO6	7 Marks
	b)	Explain the Digital Signature Standard in detail.	CO6	7 Marks
		(OR)		
6.	a)	Differentiate a message authentication code and a one-way hash function	CO2	7 Marks
	b)	List the problems that can be addressed by Kerberos.	CO1	7 Marks

UNIT-IV

7.	a)	Explain IP Security scenario along with benefits.	CO1	7 Marks
	b)	Explain OAKLEY key determination protocol.	CO1	7 Marks
		(OR)		
8.	a)	Make use of SSL protocol to solve web security issues.	CO3	7 Marks
	b)	Explain about SSL handshake protocol.	CO1	7 Marks

UNIT-V

9.	a)	Discuss various methods of phishing.	CO1	7 Marks
	b)	Differentiate software and hardware key loggers.	CO2	7 Marks
		(OR)		
10.		With a neat diagram, analyze how virus spread through: i) The internet. ii) A stand alone computer. iii) Local networks.	CO2	14 Marks

CODE No.: 16BT71501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

SYSTEM MODELING AND SIMULATION

[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Name several entities, attributes, activities, events and state variables for the following systems. CO1 9 Marks
   i) A cafeteria. ii) A grocery store. iii) A hospital emergency room.
   b) What are the events and activities associated with the use of your check book? CO1 5 Marks

(OR)

2. Consider the following continuously operating job shop. Inter-arrival times of jobs are distributed as follows: CO2 14 Marks

Time Between Arrivals (Hours)	Probability
0	0.23
1	0.37
2	0.28
3	0.12

Processing times for jobs are normally distributed, with mean 50 minutes and standard deviation 8 minutes. Construct a simulation table and perform a simulation for 10 new customers. Assume that, when the simulation begins, there is one job being processed (scheduled to be completed in 25 minutes) and there is one job with a 50-minute processing time in the queue.

i) What was the average time in the queue for the 10 new jobs?
ii) What was the average processing time of the 10 new jobs?
iii) What was the maximum time in the system for the 10 new jobs?

UNIT-II

3. a) Write a R program to find sum, mean and product of a vector. CO3 7 Marks
   b) Write a R program to find factorial of a given number. CO3 7 Marks

(OR)

4. a) Design a simple calculator using R program. CO3 7 Marks
   b) Write a R program to check whether a given number is prime or not. CO3 7 Marks

UNIT-III

5. a) List and explain terminology and concepts of statistical models in simulation. CO1 9 Marks
   b) A production process manufactures alternators for outboard engines used in recreational boating. On the average, 1**%** of the alternators will not perform up to the required standards when tested at the engine assembly plant. When a large shipment of alternators is received at the plant, 100 are tested, and, if more than two are nonconforming, the shipment is returned to the alternator manufacturer. What is the probability of returning a shipment? CO3 5 Marks

(OR)

6.	a)	Describe useful statistical models and its situations that arise to conduct simulation.	CO1	9 Marks
	b)	An industrial chemical that will retard the spread of fire in paint has been developed. The local sales representative has estimated, from past experience that 48**%** of the sales calls will result in an order. i) What is the probability that the first order will come on the fourth sales call of the day? ii) If eight sales calls are made in a day, what is the probability of receiving exactly six orders? iii) If four sales calls are made before lunch, what is the probability that one or fewer results in an order?	CO4	5 Marks

UNIT-IV

7.		Explain the characteristics of queuing systems.	CO1	14 Marks

(OR)

8.	a)	Describe important considerations of generating random numbers.	CO1	9 Marks
	b)	Generate random numbers on the interval [0, 1] with 2-digit accuracy.	CO4	5 Marks

UNIT-V

9.		Synthesize a suitable method for collecting data from stale data and time varying data.	CO5	14 Marks

(OR)

10.	a)	Explain the methods for selecting families of input distributions when data available is independent and identically distributed.	CO1	11 Marks
	b)	Design probability density functions of the Erlang distribution where $\theta = 2$ and $k = 1, 2, 4,$ and 8.	CO6	3 Marks

CODE No.: 16BT71502 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

SYSTEMS ENGINEERING
[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Compare and contrast between systems engineering and traditional engineering disciplines.	CO1	7 Marks
	b)	Write a paragraph explaining what is meant by the statement "Systems engineering is focused on the system as a whole." State what characteristics of a system are thought as this statement implies and how they are applied to systems engineering.	CO1	7 Marks
		(OR)		
2.	a)	Discuss systems engineering in the perspective of project management.	CO1	7 Marks
	b)	What is meant by the term "modularity?" What characteristics does a modular system possess? Give a specific example of a modular system and identify the modules.	CO1	7 Marks

UNIT-II

3.		Discuss about the Model of a Complex System.	CO2	14 Marks
		(OR)		
4.		Give three key activities of a systems engineer that require technical knowledge down to the component level. Under what circumstances should the systems engineer need to probe into the subcomponent level for a particular system component?	CO2	14 Marks

UNIT-III

5.	a)	Illustrate the process of eliciting the needs and requirement analysis in System Engineering.	CO3	6 Marks
	b)	Describe the general type of the organizational structure.	CO2	8 Marks
		(OR)		
6.	a)	Illustrate how needs of systems engineering are validated.	CO3	6 Marks
	b)	Discuss the advantages of using the system design team approach for a large development project.	CO3	8 Marks

UNIT-IV

7.	a)	Illustrate the types of software systems with respect to systems engineering while in a systems development cycle.	CO1	9 Marks
	b)	List the characteristics of a set of well-stated operational requirements, that is, the qualities that you would look for in analyzing their adequacy. For each, state what could be the result if a requirement did not have these characteristics?	CO4	5 Marks
		(OR)		

8.	a)	What are the measures taken to reduce the program risks during systems development cycle? Illustrate.	CO2	9 Marks
	b)	Describe and define the principal outputs (products) of the needs analysis phase. List and define the primary systems engineering activities that contribute to these products.	CO4	5 Marks

UNIT-V

9.		What specific activities in the advanced development phase sometimes cause it to be referred to as a "risk reduction" phase? Give an example of each activity considering a real or hypothetical system.	CO1	14 Marks

(OR)

10.		Graphical user interface software is generally difficult to design and test. Explain why this is true, giving at least three situations to illustrate your points. What types of development tests would you propose for each situation?	CO1	14 Marks

CODE No.: 16BT71505 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

NETWORK PROGRAMMING

[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Describe the limitations that affect the size of IP datagrams.	CO1	7 Marks
	b)	Distinguish between User Datagram Protocol and Transmission Control Protocol.	CO2	7 Marks
		OR)		
2.	a)	Explain about Byte ordering Functions.	CO1	7 Marks
	b)	Describe about listen and accept functions.	CO1	7 Marks

UNIT-II

3.	a)	Apply str_echo and str_cli functions for string operations.	CO3	7 Marks
	b)	Describe about signal handling on a POSIX-complaint system.	CO1	7 Marks
		(OR)		
4.	a)	List out various I/O models that are available in UNIX.	CO1	7 Marks
	b)	Explain the need for getsockopt and setsockopt functions.	CO1	7 Marks

UNIT-III

5.	a)	Implement UDP Echo Server.	CO4	7 Marks
	b)	Explain about outgoing interface with UDP.	CO1	7 Marks
		(OR)		
6.	a)	Discuss about gethost byname function.	CO1	7 Marks
	b)	Explain about Domain Name System.	CO1	7 Marks

UNIT-IV

7.	a)	Explain source code portability.	CO4	7 Marks
	b)	Discuss about IPV4 client-IPV6 server.	CO1	7 Marks
		(OR)		
8.	a)	Describe about Namespaces for IPC.	CO1	7 Marks
	b)	Write about the usage of uname function.	CO5	7 Marks

UNIT-V

9.	a)	Explain about Interprocess communication.	CO1	7 Marks
	b)	Apply Message queues for process communication.	CO6	7 Marks
		(OR)		
10.	a)	Explain about RPC Transparency issues.	CO1	7 Marks
	b)	Write about Implementation of rlogin for remote access.	CO1	7 Marks

CODE No.: 16BT71508 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

INTERNET OF THINGS

[Computer Science and Engineering, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain Internet of Things (IoT) with example.	CO1	9 Marks
	b)	With neat sketch, describe the structure of IOT device.	CO2	5 Marks
		(OR)		
2.	a)	Discuss about Web socket communication in IOT.	CO1	6 Marks
	b)	Explain the physical design of IOT.	CO2	8 Marks

UNIT-II

3.	a)	Explain Arduino. What are the things need to be considered for developing an application on Arduino?	CO2	7 Marks
	b)	Describe Raspberry pi interfaces.	CO3	7 Marks
		(OR)		
4.	a)	Describe the IOT applications for Smart Cities.	CO6	7 Marks
	b)	Discuss about the building blocks of an IOT Device.	CO3	7 Marks

UNIT-III

5.	a)	Explain the types of sensor devices with example.	CO2	7 Marks
	b)	Describe internet communications in IOT.	CO1	7 Marks
		(OR)		
6.		List and explain Application layer protocols.	CO3	14 Marks

UNIT-IV

7.	a)	Discuss about Requirement specifications in IOT.	CO4	9 Marks
	b)	Explain the operational view specifications in IOT.	CO1	5 Marks
		(OR)		
8.	a)	Differentiate between Device and component integration.	CO4	7 Marks
	b)	Describe process specifications in IOT.	CO4	7 Marks

UNIT-V

9.		Explain the Hadoop Ecosystem with neat sketch.	CO5	14 Marks
		(OR)		
10.	a)	Discuss about Hadoop Map reduce for batch data analysis.	CO5	7 Marks
	b)	Describe YARN Components in detail.	CO6	7 Marks

CODE No.: 16BT6HS06 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC16) Supplementary Examinations June – 2022

GERMAN LANGUAGE

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. Schreiben sie die Sätze und die Fragen in der richtigen form. CO1 14 Marks
   1. In Berlin / wohnen / ich/.
   2. Sie / heißen / wie/?
   3. Sein / wer / du ? ?
   4. Ich / aus Moskau / kommen /
   5. Heißen / er / Peter /
   6. Kommen / woher / du/
   7. Sein / mein Name / Nina/
   8. Du / wohnen / wo/?
   9. Heißen / ich / Nina.
   10. Ihr / wie / ist / Name?
   11. Ich / in Spanien / wohnen
   12. Kommen / woher / sie/?
   13. Ich / sein / Rahul
   14. Ich / Deutsch / Sprechen/

OR)

2. a) **Ergäzen Sie : (ich, Sie, du, er, sie)** CO1 7 Marks
   1. Paul kommt aus Österreich _____ Wohnt in Innsbruck.
   2. Wie heißt _____? Maria. Und du?
   3. Das ist Claudia. _____ kommt aus Deutschland.
   4. Wo wohnen _____? In Berlin. Und Sie?
   5. Hallo, _____ bin Luisa.
   6. Mein Name ist Tina. Wie heißen _____?
   7. Hallo, ich bin Maria. Entschuldigung, wie heißt _____?

   b) **Ergäzen Sie die verben in der richtigen form.** CO1 7 Marks
   1. Mein Name ist Beate Müller. Und wie _____ Sie? (heiße)
   2. Ich _____ (heißen) Emma Reiter.
   3. Ich _____ (sein) in Berlin. Und du?
   4. Wo _____ du? (wohne)In Salzburg.
   5. Woher _____ Sie (Komme) ? Aus England?
   6. Nein, ich _____ aus Australien. (Kommen)
   7. Das ist Paolo. Er _____ (Kommen) aus Italien

UNIT-II

3. **Lieber Kommilitone!** CO2 14 Marks

Sie suchen ein Zimmer, wir haben eins! Wir sind drei Studenten und haben zusammen eine Wohnung. Die Wohnung liegt zentral (Náhe U-Bahn). Das Haus ist alt und hat keinen Lift. Wir haben auch kein Telefon. Aber die Wohnung ist sehr groß: sie hat 5 Zimmer, Küche, Bad, W.C. und einen Balkon. Jeder zahlt 150 Mark Miete, zusammen 600 Mark monatlich. Die Nebenkosten (Strom, Gas, Heizung usw.) teilen wir.
Kommen Sie oder schreiben Sie bald!

Mit freunlichen Grüßen

Bitte antworten Sie

1. Was sucht der Student?
2. Was haben die drei Studenten?
3. Wo liegt die Wohnng?
4. Hat das Haus einen Lift?
5. Hat das Haus ein Telefon?
6. Wie viele Zimmer hat die Wohnung?
7. Wie hoch ist die Miete?

(OR)

4. a) **Wie viel ist das? Mathematick.** CO2 7 Marks

1. Zehn + neun + drei = ...
2. fünf + sechsundzwanzig – vier =.....
3. Sechzehn + elf – fuenf =.....
4. Neunundzwanzig = achtundachtzig =.....
5. Siebzehn + vierunfuenzig + zwanzig = ...
6. Sechsundzwanzig + Siebzehn- neun= .....
7. Achtundneunzig+ fünfzehn + zwei = ...

b) **1. Der Teekocher. Was machen Sie? Srgänzen Sie das passende verb.** CO2 4 Marks

Einschalten / stellen / warten / einfüllen

Wasser in die Kanne einfüllen Tee in den Teefilter .....1..... Teefilter in die Kanne .....2..... und den Teekocher .....3..... Ein paar Minuten.....4..... und dann den Tee genießen.

2. **Ergänzen Sie die Modalverben** (müssen / können oder wollen) CO2 3 Marks

1. Ich..... heute ins Kino gehen. Kommst du mit?
2. Mama, ich habe Hunger. Ich ..... einkaufen. Dann koche ich etwas.
3. Das machst du super, Du ..... schon gut schwimmen.

UNIT-III

5. **Schreiben Sie die Sätze.** CO3 14 Marks

1. Will/ machen / Johanna / heute Sport
2. Muss / fahren / Sie / morgen / nach Berlin.
3. Muss / bleiben / Ihre Familie / in München
4. Kann / treffen / Johanna / abends / Freunde
5. Wollen / gehen / Ihre Kinder ins Kino
6. Will / gehen / Ich / heute ins Kino
7. Muss / arbeiten / fast / jeden Tag

(OR)

6. a) **Schreiben Sie die richtige Form an**. CO2 7 Marks

1. Das ist Mara. *Ihr / Ihre / Sein/* Seine Kinder gehen zur Schule.
2. *Ihr / Ihre / Sein/*Tochter Lena spielt Saxophon.
3. *Ihr / Ihre / Sein/*Sohn Florian hat einen Computer.
4. Florian sagt: *Mein / Meine / Sein / Seine* Computer ist toll
5. Lenga sagt: *Du und Dein / deine / sein / seine* Computerspiele. Du machst nichts anderes“.
6. Mara sagt: „ *Euer / Eure / Unser / Unsere* Familie hat eine Homepage“
7. *Euer / Eure / Unser / Unsere*Hund Otto ist auch dabei!

b) **Wo ist der Schlüssel? Ergänzen Sie die Präpositionen.** CO2 7 Marks

An / auf/ hinter/ im / neben / uber / unter / vor zwischen

UNIT-IV

7. **Schreiben Sie kurze text uber sich vorstellen. Wo passen die Wörter und Redemittel?** CO4 14 Marks

Ich wohne jetzt in / Ich arbeite als / Mein name ist / Ich heiße / Mein Heimatland ist / Ich bin / (Jahre alt) / Ich komme aus / Ich spreche / Ich bin…von Beruf. Mein Hobbys sind…

1. Name: ……
2. Alter:……..
3. Land:…….
4. Wohnort:……
5. Beruf:…….
6. Sprachen:……
7. Hobbys:……..

(OR)

8. a) Wie heißt das Gegenteil? Notieren Sie das passende Wort. CO4 7 Marks
   1. Die Wohnung ist nicht teuer, sie ist .....
   2. Das zimmer ist nicht klein, es ist .....
   3. Im Garten ist es nicht leise, es ist .....
   4. Die Küche ist nicht dunkel, sie ist .....
   5. Das Haus liegt nicht weit weg, es liegt .....
   6. Feuer ist heiß und das Wasser ist .....
   7. Die Braut ist sehr glücklich aber der Bräutigam.....

   b) **Lesen Sie die Sätze 1-5 und die E-mail von Ute. Richtig oder falsch.** CO5 7 Marks

An: jana@kmail.de
Von: ute@kmail.de
Hallo Jana,
vielen Dank für deine E-mail. Das Foto ist sehr schön. Jule und Jonas sind so groß! Ich habe kein Foto, aber am Sonntag ist Familienfest, da macht mein Mann Paul sicher Fotos! Oma Gerda, seine Mutter, hat Geburtstag – sie wird 75 Jahre alt. Da kommt die ganze Familie: Pauls Eltern, klar, und alle kinder: die drei Söhne sind da, Martin, Peter und Paul, und natürlich auch Elisabeth, die Tochter. Paul freut sich total, endlich mal wieder seine Schwester zu treffen! Auch meine Eltern und meine Geshwister Felix und Julia kommen, aber mein Opa kommt leider nicht. Er ist schon 95 Jahre alt. Du, ich möchte dich gerne besuchen-nach dem Familienfest, ok?
Alles Liebe, Ute

1. Das Foto ist sehr schön.
2. Die Kinder von Jana sind Gorß
3. Das Failienfest ist am Wochenede.
4. Die Mutter von Paul hat Geburtstag.
5. Elisabeth hat einen Sohn.
6. Der Opa von Jana ist sehr alt.
7. Ute will Jana morgen besuchen.

UNIT-V

9. **Übersetzt Sie den Text** (translate the text in English) CO6 14 Marks

Wir fruehstuecken zusammen Mein Mann und ich essen Brot mit Kaese oder Wurst, Anna isst Muesli mit Milch. Mittags essen Anna und ich warm. Oft essen wir Nudeln oder eine Suppe. Nikolaj isst in der Arbeit nur ein Brotchen. Abends um sieben essen wir dann alle zusammen: Fish oder Fleisch. mit Gemuese und Reis oder Kartoffeln. Wir trinken gern Saft und Wasser.

(OR)

10. a) **Wann haben die Personen Geburtstag? Schreiben Sie die Daten.** CO6 7 Marks

Geburtstagskalender		
1.	04.01.	Angelik
2.	09.02.	Anton
3.	12.03.	Marcel
4.	07.04.	Ines
5.	20.05.	Oleg
6.	01.06.	Mirka
7.	03.07.	Igor

b) **1**. **Lessen Sie die Anzeige und notieren Sie.** CO5 4 Marks

Kerferloher Straße, Nähe U-Bahn – Zentral und ruhig! 3 zimmer – Wohnung im 4.Stock, ca. 90m^2, Wohnzimmer und Küche ist nicht dunkel, mit Balkon, Bad/WC, Ab 01.06.frei. Miete 850€ inklusive . Hausverwaltung Ohms 089-424242

a. Wie viele Zimmer?
b. Wie groß?
c. Preis?
d. Kontakt?

2. **Ergänzen Sie die Wörter.** CO5 3 Marks

Hier arbeiten 300 Menschen – für 100000 Passagiere. Täglich fahren 500.....1..... nach Hamburg, München und in andere .....2..... Es gibt 30.....3..... und Restaurants.

CODE No.: 16BT6HS11 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC16) Supplementary Examinations June – 2022

PERSONALITY DEVELOPMENT

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Give examples of try-out experiences that might be of interest to you.	CO1	14 Marks
		(OR)		
2.	a)	Describe the reaction of the people who have low self esteem.	CO1	7 Marks
	b)	Describe how a failure can pave the way to success.	CO1	7 Marks

UNIT-II

3.		Evaluate different types of attitudes and how they influence others.	CO5	14 Marks
		(OR)		
4.	a)	To develop positive attitude one needs to take care mentally, physically and emotionally – Interpret.	CO2	7 Marks
	b)	Categorize a few steps to improve your attitudes.	CO2	7 Marks

UNIT-III

5.		Self-motivation is a drive within you to get things done. Illustrate the idea with suitable examples.	CO3	14 Marks
		(OR)		
6.	a)	Anna is a receptionist at a busy production plant. The plant manager has given strict orders that his home phone number not be given to anyone under any circumstances. One day, when the plant manager is at home with the flu, a production supervisor calls in a panic. "I need him to make a decision, "the supervisor tells Anna. "I can't take responsibility for it and I need that decision now! Otherwise the whole production run could be ruined. What are Anna's options? Which one do you think would be best in this situation? Analyze the above situation and write in your own words	CO2	7 Marks
	b)	Analyze the causes and effects of stress.	CO2	7 Marks

UNIT-IV

7.		"It is important to do some preparation before you request for a raise of salary." Discuss.	CO3	14 Marks
		(OR)		
8.	a)	"It is hard for some people to accept a compliment". Infer the statement.	CO4	7 Marks
	b)	"Handling undeserved criticism takes a lot of practice". Develop the idea.	CO4	7 Marks

UNIT-V

9.		"Rules for employees are a little different in every organization". Discuss.	CO4	14 Marks
		(OR)		
10.	a)	You need to assess yourself before accepting a new job. Support the statement.	CO5	7 Marks
	b)	Evaluate your performance appraisal in the work place.	CO5	7 Marks

CODE No.: 16BT51501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations, June - 2022

COMPILER DESIGN

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Give the reasons for separating lexical analysis from syntax analysis. Write Specification of LEX program.	CO5	6 Marks
	b)	Explain with one example how identifiers and keywords are recognized by lexical analyzer.	CO1	8 Marks
		(OR)		
2.	a)	Write about machine independent phases of a Compiler Structure.	CO1	7 Marks
	b)	Describe about Interpreters.	CO1	7 Marks

UNIT-II

3.	a)	Write Recursive Descent Parser for the Grammar `S=>cAd,A->ab/a`.	CO3	7 Marks
	b)	Construct Predictive parsing table for the Grammar `S->a/#/(T),T->T,S/S`.	CO3	7 Marks
		(OR)		
4.		Consider the the following grammer i) `S->AS/b` ii) `A->SA/a` Construct SLR Parsing Table. Show the actions of parser for the string "`abab`".	CO3	14 Marks

UNIT-III

5.	a)	Write short notes on i) type conversion ii) type coercion.	CO1	6 Marks
	b)	Define Structural Equivalence of Type Expressions? Write a function which will test the structural equivalence of two type expressions.	CO1	8 Marks
		(OR)		

6.		Discuss briefly about type conversions. What is Coercions? the grammar for expressions is given below. Write the semantics rules for Coercions from integer to real.
		`E->num`
		`E->num.num`
		`E->id`
		`E->E1 op E2.`
			CO4	14 Marks

UNIT-IV

7.	a)	What are the advantages and disadvantages of heap storage allocation strategy?	CO1	7 Marks
	b)	Discuss briefly about overloading of functions and operators with suitable example.	CO1	7 Marks
		(OR)		
8.	a)	Explain the parameter passing mechanisms	CO1	7 Marks
	b)	Explain about Activation Record. With example explain how runtime memory is allocated for objects.	CO6	7 Marks

UNIT-V

9.		Explain briefly about loop optimization techniques.	CO2	14 Marks
		(OR)		
10.	a)	Write short notes on : i) Redundant sub expression elimination ii) Induction variable elements.	CO1	7 Marks
	b)	Explain data flow diagram with an example.	CO1	7 Marks

CODE No.: 16BT60114 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC16) Supplementary Examinations June – 2022

DISASTER MITIGATION AND MANAGEMENT

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Classify disasters on basis of their origin and explain the same.	CO2	7 Marks
	b)	Write a short note on Socio-economic vulnerability.	CO1	7 Marks
		OR)		
2.	a)	Discuss the impact of disasters on life and environment.	CO2	7 Marks
	b)	Explain how the public awareness is helpful in risk reduction.	CO4	7 Marks

UNIT-II

3.	a)	Write a short note on earthquakes. What are its causes?	CO2	7 Marks
	b)	Summarize the general planning and design aspects for earthquake resistant design with neat sketches based on the historical data.	CO6	7 Marks
		(OR)		
4.	a)	Give adverse effects of tsunami. Also Summarize the general planning and design aspects tsunami resistant design based on the historical data.	CO6	7 Marks
	b)	Distinguish between active control and passive control systems. Draw the block diagram of both the systems.	CO5	7 Marks

UNIT-III

5.	a)	Write a brief note on floods as a serious environmental hazard.	CO2	7 Marks
	b)	Suggest the mitigation measures for reducing impact over economic conditions of the society due to cyclones in India.	CO8	7 Marks
		(OR)		
6.	a)	Explain the necessary steps to be taken to avoid dangerous epidemics after a flood disaster.	CO4	7 Marks
	b)	Write a short note on the drought control measures adopted across the globe.	CO7	7 Marks

UNIT-IV

7.	a)	Write a short note on man-made landslides.	CO2	7 Marks
	b)	Suggest the mitigation measures for reducing impact due to landslides.	CO4	7 Marks
		(OR)		
8.	a)	Explain briefly different causes for landslides.	CO2	7 Marks
	b)	Discuss the types of landslides.	CO2	7 Marks

UNIT-V

9.		Assume that you are a nodal officer nominated from ministry. Design a disaster mitigation strategy against Tsunami in a particular locality.	CO3	14 Marks
		(OR)		
10.		Assume that you are a nodal officer nominated from ministry. Design a disaster mitigation strategy against Earthquake in a particular locality.	CO3	14 Marks

CODE No.: 16BT61503 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations, June - 2022

SOFTWARE PROJECT MANAGEMENT
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		What are the ways of generating better returns in software engineering process?	CO1	14 Marks
		(OR)		
2.	a)	Explain about Boehm five staffing principles.	CO1	7 Marks
	b)	Discuss about how reducing software size.	CO3	7 Marks

UNIT-II

3.		List out and explain the principles of modern software management.	CO2	14 Marks
		(OR)		
4.		How do you evaluate the completion of each of the four phases in software life cycle?	CO3	14 Marks

UNIT-III

5.		Differentiate the workflows present in the life cycle software development with an example.	CO4	14 Marks
		(OR)		
6.		Design and develop process view in software Architecture. Explain with an example.	CO3	14 Marks

UNIT-IV

7.		Compare and contrast the different roles present in the software project management. Explain any five roles with examples.	CO4	14 Marks
		(OR)		
8.		What are the sources of change? Why should change be made in a controlled way?	CO3	14 Marks

UNIT-V

9.		List all quality indicators and management indicators. Explain their role in project control.	CO5	14 Marks
		(OR)		
10.		What are roles of Project manager in the Agile management?	CO6	14 Marks

CODE No.: 16BT70101 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations June - 2022

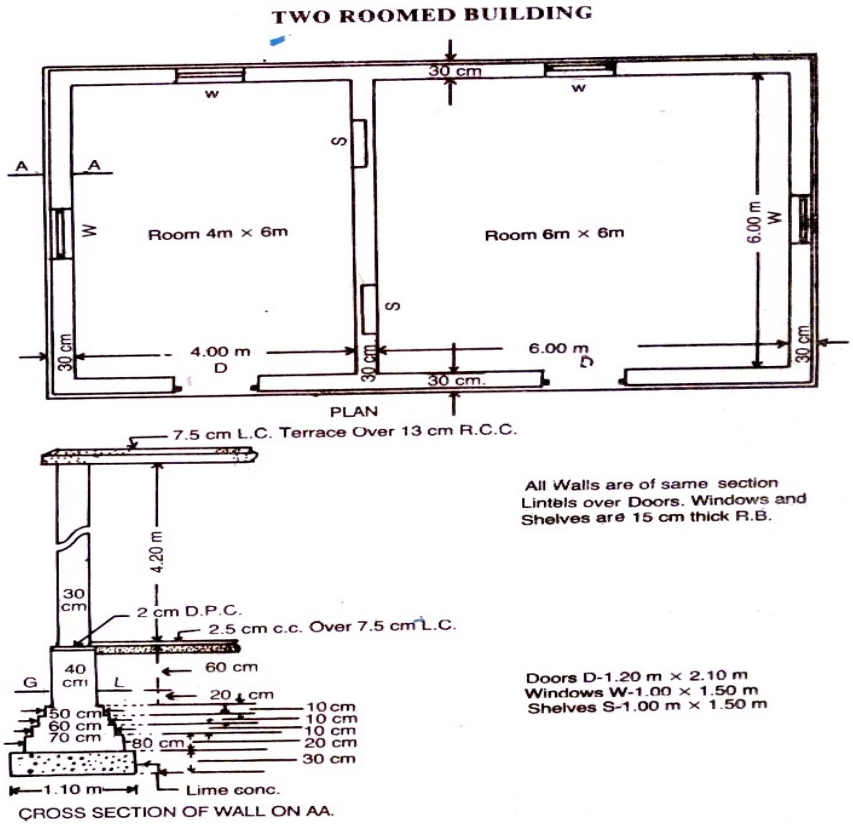
ESTIMATION AND QUANTITY SURVEYING
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. Estimate the required quantities of the following from the given figure by using individual wall method. CO4 14 Marks
   i) Earth work excavation in foundation.
   ii) Doors and windows in super structure.
   iii) Brick work up to plinth level.



(OR)

2. a) Differentiate between detailed estimate and Abstract estimate CO2 8 Marks
   b) Write a short note on degree of accuracy CO1 3 Marks
   c) Write the conditions where no deductions applied CO1 3 Marks

UNIT-II

3. Prepare a detailed estimate for supplying and laying 150mm dia. glazed stone ware pipe for 100m length jointing with 1:1 cement mortar including trenching upto a depth 0f 75 cm. Estimate should be prepared to include all materials. CO2 14 Marks

(OR)

4. Reduced level of ground along the Centre line if proposed roads from chainage 10 to chainage 20 are given below. The formation level at the 10^{th} chainage in 108m and the road is in downward gradient of 1 in 150 up to the chainage 14 and then the gradient changes to 1 in 100 downward. Formation width of the road is 10 meter and side slopes of banking are 2:1. Length of the chain is 30m. CO3 14 Marks

Calculate the cost of turfing the side slopes at a rate of Rs. 60 per sq.m and the area of side slopes by (i) Trapezoidal formula (ii) Prismoidal formula

Chainage	R.L of ground	R.L of Formation
10	105.00	108.00
11	105.60	Downward gradient 1 in 100
12	105.44	
13	105.90	
14	105.42	
15	104.30	Down gradient 1 in 100
16	105.00	
17	104.10	
18	104.62	
19	104.00	
20	103.30	

UNIT-III

5.	a)	Discuss briefly about detailed specifications of R.C.C works	CO4	8 Marks
	b)	Differentiate between general specifications and detailed specifications	CO3	6 Marks

(OR)

6.	a)	Perform the rate analysis for cement concrete work in substructure with the proportion of the cement concrete of M15 Grade, take 10cu.m	CO6	5 Marks
	b)	Calculate the Quantity of material for R.C.C. (1:2:4) for $20m^3$ of work (Slab)	CO6	5 Marks
	c)	Calculate the Quantity of material for P.C.C. (1:3:6) for $15m^3$ of work	CO5	4 Marks

UNIT-IV

7.	a)	Write a short notes about earnest money, security deposit and M-Book.	CO1	9 Marks
	b)	What is tender notice? Explain about the particulars that must be given in the tender notice.	CO1	5 Marks

(OR)

8.	a)	Discuss about the essentials requirements of contract.	CO6	5 Marks
	b)	Differentiate between open tender and limited tender.	CO1	5 Marks
	c)	What are the important legal implications of a contract?	CO5	4 Marks

UNIT-V

9.	a)	Explain about Obsolescence and Book Value	CO1	4 Marks
	b)	A 3 storey R.C.C framed structure standing on a plot of land 800 sq.m. plinth area of each storey 400 sq.m, Future life of building 70 years. The building fetching a gross rent of Rs.1500/- month. Work out capitalized value of the property on the bank of 6%. Net Yield for sinking fund 3% interest assumed. Cost of the land taken as Rs 40/sq. m. Data may be assumed suitably. Data may be as follows:	CO7	10 Marks

i. Repairs at 1/12 of gross income.
ii. Municipal tax at 20% gross rent
iii. Property tax at 5% gross rent
iv. Insurance premium @ 0.5% of gross rent
v. Management charges @ 6%of gross rent
vi. Other miscellaneous charges at 2% of gross rent.

Plinth area is at a rate of Rs. 150 per square meter.

(OR)

10.	a)	Write about Market value, Annuity, Net income	CO8	4 Marks
	b)	Calculate the standard rent of a government residential building newly constructed from the following data:	CO3	10 Marks

i. Cost of land - Rs. 20,000.
ii. Cost of construction of the building - Rs. 80,000.
iii. Cost of roads within the compound, and fencing - Rs 4000.
iv. Cost of sanitary and water supply - 12% of the cost of building.
v. Cost of electrical installation including fans - 8% of the cost of

building

vi. Municipal house tax - Rs. 400 per annum.
vii. Water tax - Rs. 250 per annum.
viii. Property tax - Rs140 per annum

CODE No.: 16BT70102 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations, June - 2022

GEOSPATIAL TECHNOLOGIES
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain effective information about the flight planning.	CO1	8 Marks
	b)	Define: i) Nadir point; ii) Line of Flight; iii) Perspective centre.	CO1	6 Marks
		(OR)		
2.	a)	Explain Mosaic and also explain advantages and disadvantages of Mosaic.	CO1	7 Marks
	b)	Calculate the scale of photographs; its flying height is 2100m, elevation of terrain 500m and focal length152.5mm.	CO2	7 Marks

UNIT-II

3.		What are the basic processes and elements involved in electromagnetic remote sensing of earth resources? Explain them.	CO2	14 Marks
		(OR)		
4.	a)	Explain the following : i) Temporal resolution ii) Spatial resolution iii) Spectral resolution.	CO3	7 Marks
	b)	Explain the basics of visual interpretation of imageries.	CO3	7 Marks

UNIT-III

5.		Analyze the fundamental operations of GIS in detail.	CO2	14 Marks
		(OR)		
6.		What is a projection system? Explain the Polyconical Projection System.	CO4	14 Marks

UNIT-IV

7.		Explain about data manipulation and analysis in GIS.	CO6	14 Marks
		(OR)		
8.		Explain about the segments of GPS.	CO4	14 Marks

UNIT-V

9.		Discuss about Flood and drought impact assessment and monitoring.	CO5	14 Marks
		(OR)		
10.		Explain the Inland water quality survey and management by using GIS.	CO7	14 Marks

CODE No.: 16BT70103 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations, June - 2022

RAILWAY, AIRPORT AND HARBOUR ENGINEERING

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain what is meant by track alignment. What are the basic requirements of good alignment? Discuss in detail, the factors which control the alignment of a railway track.	CO1	7 Marks
	b)	Derive an expression for super elevation in railways.	CO2	7 Marks
		(OR)		
2.	a)	Illustrate with a neat sketch, the turnout, points and crossings and explain their working principles.	CO1	7 Marks
	b)	A branch line of eight degree curve diverges in opposite direction from broad gauge main line with five degree curve. The speed on the branch line is 30 km/hr. Calculate the super elevation and permissible speed on the main line.	CO6	7 Marks

UNIT-II

3.	a)	Classify the stages in construction of railway track and explain in detail.	CO1	7 Marks
	b)	Explain in detail about the passenger amenities to be provided in railway station	CO1	7 Marks
		(OR)		
4.	a)	Classify the advantages and disadvantages of conventional maintenance and modern maintenance techniques.	CO5	7 Marks
	b)	List out the type of railway stations and explain each one in detail.	CO1	7 Marks

UNIT-III

5.	a)	Explain the merits and demerits of air transport.	CO1	7 Marks
	b)	Explain the night time aids provided at the airport.	CO1	7 Marks
		(OR)		
6.	a)	What are the different systems of aircraft parking? Explain the suitability of each system.	CO1	7 Marks
	b)	Draw an airport layout and explain its components.	CO1	7 Marks

UNIT-IV

7.	a)	The length of runway under standard conditions is 1620m. The airport site has an elevation of 270 m; its reference temperature is 32.90°c. If the runway is to be constructed with an effective gradient of 0.20%. Determine the corrected runway length.	CO3	7 Marks
	b)	Write a short notes on: i) Airport drainage. ii) Factors considered in taxiway design.	CO1	7 Marks
		(OR)		
8.	a)	Explain the role of wind rose diagrams in the orientation of runways.	CO1	7 Marks
	b)	Discuss in detail about: i) Various design factors to be considered in determining the thickness of pavement. ii) Special consideration for pavement design.	CO3	7 Marks

UNIT-V

9.	a)	Describe any four factors of site investigation for location of harbours and the significance of each one of them.	CO4	7 Marks
	b)	Explain any six factors, for which a harbour engineer must have consideration, while planning and designing a harbour.	CO8	7 Marks
		(OR)		
10.	a)	Illustrate with neat sketches any four types of coastal protection works.	CO1	7 Marks
	b)	Discuss in detail about the environmental concern required for port operation.	CO7	7 Marks

CODE No.: 16BT70106 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations, June - 2022

ENVIRONMENTAL IMPACT ASSESSMENT AND MANAGEMENT
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What are the basic concepts of EIA? Describe.	CO1	7 Marks
	b)	How an Initial environmental examination helps for a full scale EIA?	CO2	7 Marks
		(OR)		
2.	a)	Analyse the EIA process providing solutions for environmental problems.	CO3	7 Marks
	b)	Describe about the factors affecting EIA.	CO2	7 Marks

UNIT-II

3.	a)	Explain the criteria followed in selecting EIA methodology.	CO1	7 Marks
	b)	Describe the matrix method of EIA.	CO1	7 Marks
		(OR)		
4.		Analyse the Checklist and Overlay methods of EIA.	CO2	14 Marks

UNIT-III

5.	a)	Discuss the mitigation measures of soil impacts from an angle of sustainable development.	CO6	7 Marks
	b)	Explain any one developmental activity which cause significant impact on surface water resources and suggest appropriate mitigation measures.	CO2	7 Marks
		(OR)		
6.		Explain methodology for the assessment of impacts on health and safety due to adverse changes in soil environment.	CO5	14 Marks

UNIT-IV

7.	a)	Differentiate between deforestation and forest degradation.	CO2	7 Marks
	b)	Explain the impact of development Activities on Vegetation and wildlife.	CO1	7 Marks
		(OR)		
8.	a)	How can you predict the impacts of the project activity on health and safety of people? Discuss.	CO5	7 Marks
	b)	How do you identify various potential environmental problems resulting from an Engineering project? Explain briefly.	CO3	7 Marks

UNIT-V

9.	a)	Discuss about Environmental Protection Act, 1986.	CO7	7 Marks
	b)	Discuss the need for public awareness on environment impact assessment.	CO2	7 Marks
		(OR)		
10.		What is meant by Environmental Audit? What are the different objectives of it? Explain.	CO8	14 Marks

CODE No.: 16BT70113 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations, June - 2022

HIGHWAY CONSTRUCTION AND MAINTENANCE
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	List different methods of roads construction. Discuss their advantages and limitations.	CO1	7 Marks
	b)	Discuss about the procedure and materials used in the construction of subgrade.	CO1	7 Marks
		(OR)		
2.	a)	What are the problems in the construction of high embankments over weak foundation soils?	CO1	7 Marks
	b)	With the aid of neat sketches, show the different types of joints and their positions.	CO1	7 Marks

UNIT-II

3.	a)	Compare flat wheeled rollers & sheep foot rollers.	CO2	7 Marks
	b)	What are the factors affecting properties of soil- bitumen?	CO1	7 Marks
		(OR)		
4.	a)	Compare between soil cement stabilization and soil lime stabilization.	CO2	7 Marks
	b)	Explain the mechanics of soil stabilization.	CO1	7 Marks

UNIT-III

5.	a)	The maximum quantity of water expected in one of the open longitudinal drains on clayey soil is 1.2m^3/sec. Design the cross section and longitudinal slope of trapezoidal drain assuming the bottom width of the trapezoidal section to be 0.8m and cross slope to be 1.0 vertical to 1.5 horizontal. The allowable velocity of flow in the drain is 0.9m/sec and Manning's roughness coefficient is 0.02.	CO3	7 Marks
	b)	Estimate the design quantity of flow on a road side drain for 25 years period of occurance of storm from the following data: Width of drainage area along bare soil with cross slope of 1.0% upto the side drain=300m; length of longitudinal side drain = 650m; allowable velocity of flow = 0.5m/sec; weighted average value of run off coefficient 0.3.	CO2	7 Marks
		(OR)		
6.	a)	Explain how the surface water is collected and disposed off in: i) Rural roads. ii) Urban roads.	CO1	7 Marks
	b)	Give the solution how to control soil erosion on earth slopes.	CO4	7 Marks

UNIT-IV

7.		Mention different tools used in Highway construction.	CO5	14 Marks
		(OR)		
8.		Draw layout of hot mix bitumen plants and name various units required for it.	CO1	14 Marks

UNIT-V

9.	a)	Write an explanatory note on cross drainage and drainage structures.	CO1	7 Marks
	b)	Write the objectives of environmental impact studies.	CO1	7 Marks
		(OR)		
10.	a)	List the different flexible pavement failures and explain briefly.	CO1	7 Marks
	b)	Explain the principle behind Benkelman beam test and state its uses.	CO2	7 Marks

CODE No.: 16BT70120 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC16) Supplementary Examinations June – 2022

GROUND IMPROVEMENT TECHNIQUES
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss the role of ground improvement on foundations.	CO1	7 Marks
	b)	Report the selection criterion for ground improvement based on soil conditions.	CO2	7 Marks
		(OR)		
2.	a)	Classify ground modification techniques.	CO2	7 Marks
	b)	Explain emerging trends in ground improvement.	CO1	7 Marks

UNIT-II

3.	a)	Write short notes on the following with reference to dewatering: i) Horizontal wells. ii) Foundation drains. iii) Blanket drains.	CO1	7 Marks
	b)	Explain how electro-osmosis technique is effective for dewatering in cohesive soils.	CO5	7 Marks
		(OR)		
4.	a)	List out the various dewatering systems used in different soils. Discuss the effect of each system on environment. When are deep wells used for dewatering?	CO7	7 Marks
	b)	Why dewatering is required in soil? Explain with neat sketches dewatering using sumps and interceptor ditches.	CO2	7 Marks

UNIT-III

5.	a)	Explain the method of construction of stone columns by vibro-displacement method. What are the safety precautions to be taken during installation of stone columns?	CO6	7 Marks
	b)	Compare the relative merits of various methods of in-situ treatment of cohesive and cohesionless soils.	CO2	7 Marks
		(OR)		
6.	a)	What are the properties of compacted soil and highlight the benefits of compacted soil in connected with the geotechnical engineering?	CO2	7 Marks
	b)	Soils from the following locations in Tirupati have the following properties. Identify the problems associated with these soils and suggest suitable ground improvement methods and justify. Site at Daminedu Village: Liquid Limit = 85%, Plastic Limit = 41%, Shrinkage Limit = 18 %, Free Swell Index = 140%. Government has planned to build LIG Multistoried Apartments. Site at Tiruchanoor Village: SPT N increases from 4 at 1.5 m depth to 20 at 15 m depth. The site is located on the banks of river Swarnamukhi. Government has planned to build Multistoried Hostel Buildings.	CO4	7 Marks

UNIT-IV

7.	a)	What are the various admixtures used in stabilization of soil? Describe in detail the engineering benefits of lime modification of soils.	CO1	7 Marks
	b)	List the different types of grouts. What are the factors that influence the grout requirement? Write the safety precautions to be taken during grouting.	CO6	7 Marks

(OR)

8.	a)	Define free swell index. What are the foundation techniques that are adopted in sites with expansive soils?	CO1	7 Marks
	b)	Distinguish cement stabilization and bituminous stabilization along with their merits and demerits.	CO5	7 Marks

UNIT-V

9.	a)	Provide one application each of geomembrane and geogrid types of reinforcements.	CO1	7 Marks
	b)	Write a note on various functions and properties of geosynthetics.	CO1	7 Marks

(OR)

10.	a)	Explain the soil reinforcement interaction with neat sketches.	CO2	5 Marks
	b)	Design the reinforcement for internal stability of a 6m high reinforced earth wall. The metallic reinforcing strips are 120mm wide having tensile strength of 18kN. The horizontal spacing of strips is fixed as 1m. Find the vertical spacing and effective length of strips. Draw the final diagram. Given the back fill soil has 18kN/m^3 unit weight, friction angle =45^0, the friction angle between soil and reinforcement is 20^0.	CO3	9 Marks

CODE No.: 16BT70201 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations June - 2022

POWER SYSTEM OPERATION AND CONTROL
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. There are three thermal generating units which can be committed to take the system load. The fuel cost data and generation operating unit data are given below: CO4 14 Marks

$F_1 = 392.7 + 5.544\ P_1 + 0.001093\ P_1^2$;
$F_2 = 217 + 5.495\ P_2 + 0.001358\ P_2^2$;
$F_3 = 65.5 + 6.695\ P_3 + 0.004049\ P_3^2$;
P_1, P_2, P_3 in MW,

Generation limits: $150 \leq P_1 \leq 600$ MW: $100 \leq P_2 \leq 400$ MW; $50 \leq P_3 \leq 200$ MW. There are no other constraints on system operation. Obtain an optimum economic load dispatch for the load level of 900 MW.

(OR)

2. a) Give iteration algorithm for solving economic scheduling problem, without transmission loss. CO1 9 Marks
   b) Explain economic dispatch of thermal plants coordinating the system transmission line losses. CO1 5 Marks

UNIT-II

3. a) What are the important methods of hydro-thermal coordination? CO1 2 Marks
   b) Derive the condition for economic generation of steam and hydro plants for short term scheduling. State the assumptions made. CO6 12 Marks

(OR)

4. a) Discuss the advantages of operation of power plants with hydro thermal combinations. CO1 4 Marks
   b) In a two plant operation system, the hydro plant is operate for 8 hrs. during each day and the steam plant is operate all over the day. The characteristics of the steam and hydro plants are CO4 10 Marks
   $C_s = 20 + 30P_s + 0.04P_s^2$ Rs/h and $W_H = 7.5P_H + 0.0012P_H^2$ m^3/sec
   When both plants are running, power flow from steam plant to load is 190 MW and the total quantity of water is used for hydro plant operation during 8 hrs is 220×10^6 m^3. Determine generation of hydro plant and cost of water used. Neglect transmission losses.

UNIT-III

5. a) What do you mean by unit commitment? Discuss various constraints related to unit commitment problem. CO2 7 Marks
   b) Does unit commitment guarantee economic power of power generation? Justify your answer. CO2 7 Marks

(OR)

6. a) Explain briefly the constraints on unit commitment problem. What is spinning reserve and does this reserve help in operating a power system efficiently? CO2 8 Marks
   b) Explain with a neat flowchart the procedure for finding the solution for unit commitment problems using forward DP method. CO1 6 Marks

UNIT-IV

7.	a)	Describe the fundamental characteristics of an excitation system.	CO1	5 Marks
	b)	Draw and explain the block diagram representation of IEEE Type-1 model.	CO2	9 Marks
		(OR)		
8.	a)	Explain clearly what you mean by compensation of line and discuss briefly different methods of compensation.	CO1	5 Marks
	b)	With a neat sketch, explain how a STATCOM works.	CO5	9 Marks

UNIT-V

9.	a)	How is speed governor mechanism modeled? Explain its operations with the speed characteristics.	CO3	9 Marks
	b)	Explain briefly the control area concept and control area error.	CO1	5 Marks
		(OR)		
10.	a)	Draw the schematic diagram of a load frequency control loop (LFC) and explain the operation.	CO1	6 Marks
	b)	Draw and analysis the basic P-f and Q-V control loops.	CO2	8 Marks

CODE No.: 16BT70202 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations, June - 2022

SWITCHGEAR AND PROTECTION
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain about the working of an Induction type directional over current relay with a neat sketch.	CO1	7 Marks
	b)	Derive the expression for universal torque equation and obtain the characteristics of a directional relay from the torque equation.	CO2	7 Marks
		(OR)		
2.	a)	Discuss how an amplitude comparator can be converted into a phase comparator and vice versa.	CO1	6 Marks
	b)	Explain the operation of a Static inverse time over current relay with the help of a block diagram.	CO1	8 Marks

UNIT-II

3.	a)	What is the phenomenon of current chopping in a circuit breakers and justify how current chopping can be minimized using resistance switching?	CO2	8 Marks
	b)	Determine the radius of the wire that will blow off at a current of 1A, if the fuse wire of circular cross- section having a radius of 0.8 mm blows off at a current of 8 A.	CO4	6 Marks
		(OR)		
4.	a)	Describe briefly the operation of an oil circuit breaker and explain how the oil helps in arc extinction.	CO1	6 Marks
	b)	Explain with a neat sketch about the elementary principle of arc interruptions.	CO1	8 Marks

UNIT-III

5.	a)	Explain briefly about the restricted earth fault protection scheme used for the protection of a transformer.	CO5	6 Marks
	b)	Evaluate the CT ratio on 11000 Volts side of a 3Φ transformer having 220/11000 line volts, connected in Y/Δ. The protective transformers on 220 Volts side have a current ratio of 600/5 Amps.	CO4	8 Marks
		(OR)		
6.	a)	A three-phase, 11 kV/ 132 kV, delta-star connected power transformer is protected by differential protection. The CT's on the LV side have a current ratio of 500/5 A. Design a suitable CT's on the HV side and how it should be connected for proper protection?	CO3	6 Marks
	b)	Explain how the inclusion of a resistance in the neutral earthing circuit of an alternator affects the performance of the differential protection of the three phase stator.	CO2	8 Marks

UNIT-IV

7.	a)	Explain the various surge absorbers used for over voltage protection.	CO1	7 Marks
	b)	What is Insulation coordination and justify how it is used for the protection against over voltages?	CO2	7 Marks
		(OR)		

8.	a)	Explain in detail basic impulse insulation level (BIIL).	CO1	7 Marks
	b)	Write a short notes on the following. i) Lightening phenomenon. ii) Metal oxide surge arrester.	CO1	7 Marks

UNIT-V

9.	a)	A 50 Hz, 3-phase overhead line has phase to ground shunt capacitance of 0.08 μF. Determine the inductance required in neutral to ground circuit to eliminate an arcing-ground at: i) The other end of the line. ii) At 70 % length of line from the neutral earthing end.	CO4	7 Marks
	b)	Evaluate the Ohmic value of impedance to be connected in the neutral to ground circuit of a 2000 kVA transformer with earth fault relay set to 40 % with respect to 400 V side.	CO4	7 Marks

(OR)

10.	a)	What are the dangerous effects of improper earthing in domestic and industrial buildings to a humans?	CO6	8 Marks
	b)	A 230 kV, 3-phase, 50 Hz, 200 km transmission line has a capacitance to earth of 0.02 μF/km per phase. Design the parameters and kVA rating of the Peterson coil used for earthing the above system.	CO3	6 Marks

CODE No.: 16BT70205 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations, June - 2022

POWER SYSTEM AUTOMATION
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		With neat diagram, explain various operating states of a power system.	CO1	14 Marks
		(OR)		
2.	a)	Discuss briefly about Investment factor in power system.	CO1	7 Marks
	b)	With neat sketch, describe the organization and operation activities in power system control.	CO1	7 Marks

UNIT-II

3.	a)	With neat block diagram, discuss SCADA in detail.	CO1	7 Marks
	b)	Illustrate about Human Machine Interface (HMI) in power system.	CO2	7 Marks
		(OR)		
4.	a)	Write brief description about the SCADA communication systems.	CO2	7 Marks
	b)	List various types of SCADA systems used in industry.	CO6	7 Marks

UNIT-III

5.		Draw the substation automation architecture and explain each block.	CO1	14 Marks
		(OR)		
6.	a)	Describe various equipments in conventional substation.	CO1	7 Marks
	b)	Explain the benefits of an automated substation as against a conventional substation.	CO2 CO4	7 Marks

UNIT-IV

7.	a)	List the merits and demerits of Distribution Automation.	CO1	7 Marks
	b)	Discuss briefly about the subsystems in distribution control center.	CO1	7 Marks
		(OR)		
8.		Explain in detail about the Distribution Automation architecture.	CO1	14 Marks

UNIT-V

9.	a)	What is deregulation? Discuss in detail about the need for deregulation in modern power systems.	CO1	7 Marks
	b)	List various the advantages of deregulation in power systems.	CO1	7 Marks
		(OR)		
10.		Explain in detail about the various restructuring models.	CO2	14 Marks

CODE No.: 16BT70301 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations June - 2022

AUTOMOBILE ENGINEERING
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Classify automobiles bases on various considerations.	CO1	7 Marks
	b)	Discuss the relative merits and demerits of Front engine rear wheel drive.	CO1	7 Marks
		(OR)		
2.	a)	Explain the working of A.C. Mechanical pump with the help of a neat sketch.	CO2	7 Marks
	b)	Enumerate the requirements of fuel supply system for CI engines.	CO2	7 Marks

UNIT-II

3.	a)	Explain the air cooling system with a neat sketch. Discuss its advantages and limitations also.	CO3	7 Marks
	b)	List out the functions of Ignition system and components of battery ignition system.	CO3	7 Marks
		(OR)		
4.		Explain the working of battery ignition system with the help of a neat diagram. Discuss its relative merits over electronic ignition system.	CO3	14 Marks

UNIT-III

5.		List out the pollutants from SI engines and CI engines separately and discuss the sources for them from SI and CI engines working point of view. Explain the working of catalytic converted used for SI engines with the help of a neat sketch.	CO5	14 Marks
		(OR)		
6.		Discuss the suitability, relative merits and demerits of using the following alternative fuels for automobiles. i) Hydrogen. ii) Alcohols. iii) CNG.	CO5	14 Marks

UNIT-IV

7.	a)	Explain the working of centrifugal clutch with a neat diagram. What are the differences between semi centrifugal and centrifugal clutch?	CO3	7 Marks
	b)	What are the functions of Transmission system? Discuss the necessity for Transmission.	CO3	7 Marks
		(OR)		
8.	a)	Enumerate the requirements and functions of steering system. Sketch any two types of stub axles.	CO3	7 Marks
	b)	Explain the conditions of Understeering and Oversteering with neat sketches and how to avoid them.	CO3	7 Marks

UNIT-V

9.	a)	What are the objectives of Suspension? Discuss the basic considerations while designing suspension.	CO3	7 Marks
	b)	What are the requirements of braking system? Construct a diagram of simple mechanical brake system.	CO3	7 Marks
		(OR)		
10.		Explain the working of Hydraulic brake system with the help of neat sketch discuss its advantages and disadvantages.	CO3	14 Marks

CODE No.: 16BT70302 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations, June - 2022

FINITE ELEMENT METHOD
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Write three dimensional basic equations of elasticity and reduce the stress strain relation matrix for 2-D and 1-D finite elements. CO1 7 Marks

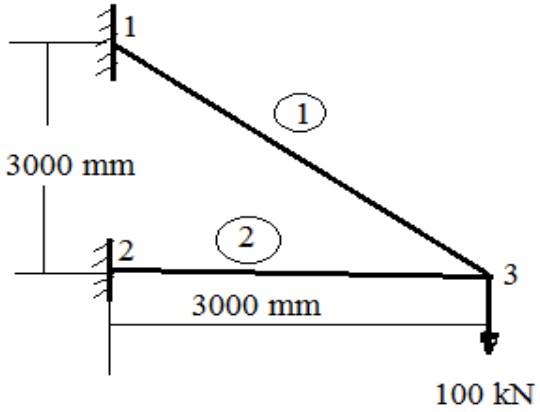
   b) If a displacement field is described as follows, $u = (-X^2 + 3Y^2 + 7XY)\ 10^{-4}$ and $v = (2X + 4Y - 2Y^2)\ 10^{-4}$, determine the three planar stresses and strains at the point X= 0, Y= 1. Assume E = 2 **x** 10^5 N/mm². Poisson's ratio is 0.3. CO1 7 Marks

(OR)

2. Using two finite elements, find the stress distribution in uniformly tapering bar of circular cross sectional area 3 cm² and 2 cm² at their ends, length 100 mm, subjected to an axial tensile load of 50 N at smaller end and fixed at larger end. Take the value of Young's modulus 2 x 10^5 N/mm². CO1 14 Marks

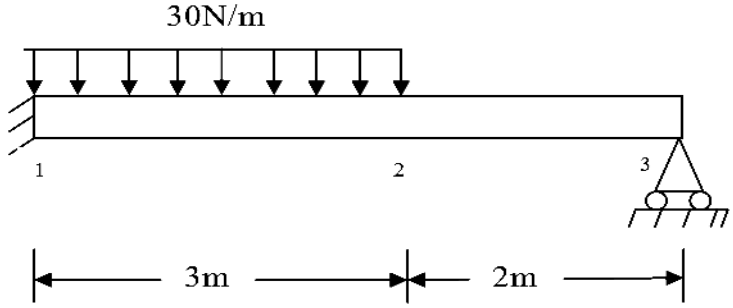
UNIT-II

3. For the two-bar truss shown in figure, determine the displacements and stress. A_1=500mm², A_2=1200mm², E=2 x 10^5 N/mm². CO2 14 Marks



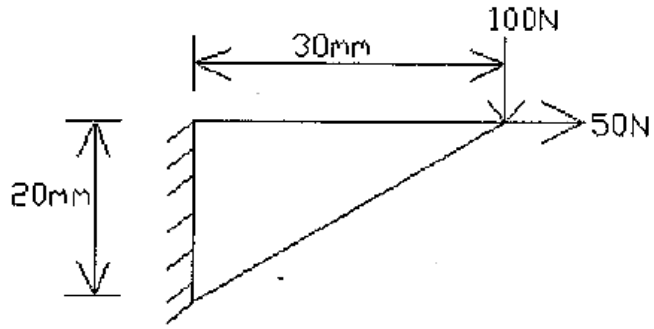
(OR)

4. For the loaded beam shown in figure, determine the slope and deflection at node 2 using finite element concept. Take EI=900 Nm². CO2 14 Marks



UNIT-III

5. For a triangular plate shown in figure, determine the deflection at the point of load using one triangular element. Thickness is 10 mm, $E = 70 \times 10^3$ MPa, $\mu = 0.3$. CO3 14 Marks



(OR)

6. A long cylinder of inside diameter 80 mm and outside diameter 120 mm fits in a hole over its full length. The cylinder is then subjected to an internal pressure of 2 MPa. Using 2 elements on the 10mm length, find the displacements at the inner radius. E = 200 GPa and $\mu = 0.3$. CO3 14 Marks

UNIT-IV

7. For the isoparametric quadrilateral element, determine the local coordinates (ξ, η) of the point P which has Cartesian coordinates (7, 4). Nodal coordinates in Cartesian system are 1(3,1), 2(6,1), 3(8,6) and 4(2,5). CO1 14 Marks

(OR)

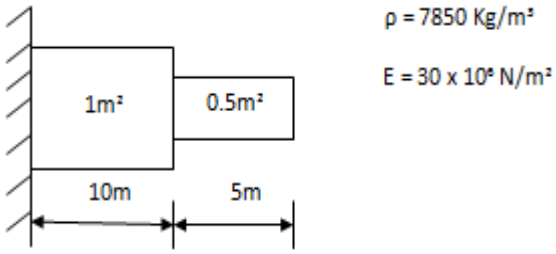
8. A wall of 0.6m thickness having thermal conductivity of 1.2 W/mK the wall is to be insulated with a material of thickness 0.06 m having an average thermal conductivity of 0.3 W/mK. The inner surface temperature is 1000ºC and outside of the insulation is exposed to atmospheric air at 30ºC with heat transfer coefficient of 35 W/m^2K. Calculate the nodal temperatures using FEM. CO4 14 Marks

UNIT-V

9. Derive mass matrices for 1D Bar Element and Truss Element. CO5 14 Marks

(OR)

10. Determine the Eigen values and Eigen Vectors for the stepped bar as shown in figure. CO6 14 Marks



CODE No.: 16BT70303 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations, June - 2022

OPERATIONS RESEARCH
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. A company produces two types of leather belts types A and B. Belt A is of a superior quality and belt B is of a lower quality. Profits on the two types of belts are 40 and 30 paise per belt respectively. Each belt of type A requires twice as much time as required by a belt of type B. if all the belts were of type B the company could produce 1000 belts per day. The supply of leather however is sufficient only for 800 belts per day. Belt A requires a fancy buckle and only 400 fancy buckles are available per day. For belt of type B only 700 buckles are available per day. Formulate LP model and solve the problem. CO1 14 Marks

(OR)

2. Solve the following LPP by using Two-Phase Method CO2 14 Marks

Minimize $Z = 4x_1 + x_2$

Subjected to the constraints

$3x_1 + x_2 = 3$

$4x_1 + 3x_2 \geq 6$

$x_1 + 2x_2 \leq 4$

$x_1, x_2 \geq 0$

UNIT-II

3. Find the optimal solution for the following transportation problem. CO3 14 Marks

Manufacturing plants	D_1	D_2	D_3	D_4	Capacity
A	6	5	4	1	70
B	3	8	2	6	60
C	4	4	2	1	90
Demand	40	30	80	70	

(OR)

4. Solve the assignment problem represented by the matrix. CO4 14 Marks

	1	**2**	**3**	**4**	**5**	**6**
A	9	22	58	11	19	27
B	43	78	72	50	63	48
C	41	28	91	37	45	33
D	74	42	27	49	39	32
E	36	11	57	22	25	18
F	3	56	53	31	17	28

UNIT-III

5. The initial cost of a machine is Rs. 6100 and resale value drops as the time passes. Cost data are given in the following table: CO6 14 Marks

Year	1	2	3	4	5	6	7	8
Maintenance	100	250	400	600	900	1200	1600	2000
Resale Value	800	700	600	500	400	300	200	100

When should the machine be replaced?

(OR)

6. a) What do you understand by zero - sum and non zero – sum game? What do you mean by strategy, dominance and saddle point? CO6 6 Marks

b) Solve the following 3 x 3 game. Find the value of game and strategy of player A and B. CO6 8 Marks

		Player B		
Player A		B1	B2	B3
	A1	1	7	2
	A2	0	2	7
	A3	5	1	6

UNIT-IV

7. a) Distinguish between CPM and PERT. CO5 4 Marks

b) Consider a project consisting of nine jobs with the following precedence relation and average time estimates. CO5 10 Marks

i) Draw a Network.
ii) Find the critical path.
iii) Find total float, free float and independent float.

Job	A	B	C	D	E	F	G	H	I
Predecessor	-	-	A,B	A,B	B	D,E	C,F	D,E	G,H
Time (Days)	30	20	10	20	15	12	35	20	30

(OR)

8. The following table gives the information relating to a project. By using the given data calculate the optimum duration of the project and corresponding cost. Where indirect cost is estimated as Rs.2000 per day. CO5 14 Marks

Activity	Normal		Crash	
	Time(Days)	Cost(Rs.)	Time(Days)	Cost(Rs.)
1-2	4	1000	3	2000
1-3	2	1500	1	3500
2-4	2	500	1	900
2-5	5	1000	3	4000
3-4	3	1000	1	2000
4-5	2	800	1	1000

UNIT-V

9. a) Discuss the elements of structure of queuing system. CO3 4 Marks

b) In a store with one server, 9 customers arrive on an average of 5 minutes. Service is done for 10 customers in 5 minutes find CO3 10 Marks

i) The avg. no of customers in the system
ii) The avg. queue length
iii) The avg. time a customer spends in the store.
iv) The avg. time a customer waits before being served.

(OR)

10. a) What is simulation? Describe the advantages in solving the problems. CO5 4 Marks

b) A company observes from past experience that the demand for a special product has the following probability distribution, CO5 10 Marks

Daily demand	5	10	15	20	25	30
Probability	0.01	0.20	0.15	0.50	0.12	0.02

Simulate the demand for next 10 days. Also find the average demand.

CODE No.: 16BT70304 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations, June - 2022

CRYOGENICS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What is the necessity of low temperature?	CO1	6 Marks
	b)	Write the Limitations of Vapour compression refrigeration system for low temperature applications.	CO1	8 Marks
		(OR)		
2.		What is multistage refrigeration system and explain the cascade refrigeration system with a neat sketch.	CO2	14 Marks

UNIT-II

3.	a)	Discuss the properties of helium isotopes at cryogenics range.	CO3	4 Marks
	b)	What are the properties of liquid neon?	CO3	10 Marks
		(OR)		
4.	a)	Discuss low temperature properties of engineering materials. i) Mechanical properties. ii) Thermal properties. iii) Electrical properties.	CO3	6 Marks
	b)	Explain the properties of liquid methane.	CO3	8 Marks

UNIT-III

5.	a)	Define Liquefication process and explain the importance of liquefication process.	CO4	7 Marks
	b)	What is Joule's Thompson coefficient (μ) and prove that for the production of cooling effect by throttling, the value of a μ must be positive.	CO4	7 Marks
		(OR)		
6.		Explain the method used in Liquefication of Helium with neat sketches.	CO4	14 Marks

UNIT-IV

7.	a)	Discuss the effects of cryogenics on low temperature of metals.	CO4	7 Marks
	b)	Explain how cryogenics is used in cryosurgery.	CO1	7 Marks
		(OR)		
8.		Explain the application of cryogenics in detail.	CO4	14 Marks

UNIT-V

9.	a)	Explain briefly fibrous materials multi layer super insulation.	CO5	7 Marks
	b)	Write briefly on composite insulation.	CO5	7 Marks
		(OR)		
10.		Discuss the advantages and disadvantages of insulations, used in cryogenic systems.	CO5	14 Marks

CODE No.: 16BT70309 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations, June - 2022

INDUSTRIAL ROBOTICS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Classify Robots based on the workspace geometry.	CO1	7 Marks
	b)	Distinguish pneumatic and hydraulic drive systems.	CO2	7 Marks
		(OR)		
2.	a)	Characterize the mechanical type of grippers.	CO1	7 Marks
	b)	Design a gripper and analyse the forces that act on a gripper.	CO3	7 Marks

UNIT-II

3.		Point out any two methods of Rotary to linear motion conversion systems.	CO2	14 Marks
		(OR)		
4.	a)	Discuss the working principle of Stepper motors.	CO2	7 Marks
	b)	List out the advantages and disadvantages of servo motors.	CO1	7 Marks

UNIT-III

5.		Formulate Forward and reverse Kinematics equations for a 2 link system.	CO3	14 Marks
		(OR)		
6.		The Coordinates of the point P on the body given by $\{2, -1, 5\}^T$. The point moved by 5 units along Z axis, then rotation of 45^0 about X axis followed by rotation of 30^0 about Y axis. Determine the new coordinates of the point P with respect to the fixed frame.	CO3	14 Marks

UNIT-IV

7.		Investigate the principles used in any two proximity sensors. Also list out the applications.	CO4	14 Marks
		(OR)		
8.	a)	Explain the obstacle avoidance methods used in Robotics.	CO2	7 Marks
	b)	Demonstrate any two position sensors with a neat sketch.	CO4	7 Marks

UNIT-V

9.	a)	Discuss the characteristics of a Robot Programming language.	CO2	7 Marks
	b)	Outline the teach pendant method of programming a Robot.	CO2	7 Marks
		(OR)		
10.		Interpret the safety considerations and challenges faced in designing a Robot.	CO6	14 Marks

CODE No.: 16BT70311 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations, June - 2022

PRODUCTION AND OPERATIONS MANAGEMENT
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define Operations Management with due consideration to Production as one of the important entity.	CO2	7 Marks
	b)	Discuss the historical development of operations Management.	CO2	7 Marks
		(OR)		
2.	a)	Define Productivity. Discuss the factors that promote productivity.	CO3	7 Marks
	b)	Give a brief note on the significance of production systems decisions with suitable examples.	CO4	7 Marks

UNIT-II

3.		You are required by an emerging company to forecast demand for their FMCG product. Explain how you would forecast demand with suitable assumptions.	CO5	14 Marks
		(OR)		
4.		List qualitative and quantitative methods of forecasting? Discuss about any one method in detail.	CO3	14 Marks

UNIT-III

5.		Discuss the strategies for Production Planning. Give an account to criterion for selection of the strategy.	CO1	14 Marks
		(OR)		
6.		Explain with a suitable case-study 'why Mixed strategies are always superior to pure strategies in an aggregate production planning'.	CO6	14 Marks

UNIT-IV

7.		Discuss Enterprise Resource Planning (ERP) with a suitable example.	CO4	14 Marks
		(OR)		
8.		Discuss about MRP in detail by giving an account to inputs and outputs of MRP.	CO1	14 Marks

UNIT-V

9.		There are 5 jobs each of which must go through 2 machines A and B in order immediately processing Times are given below.	CO4	14 Marks

	JOB1	JOB2	JOB3	JOB4	JOB5
Time for A	6	2	10	4	12
Time for B	3	7	8	9	3

Determine the sequence for 5 jobs that will minimize, the elapsed time calculates the total idle time for machines in this Period.

(OR)

10.		What is job shop scheduling? Discuss the Johnsons algorithm for solving scheduling problems in operations management.	CO4	14 Marks

CODE No.: 16BT70312 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC16) Supplementary Examinations June – 2022

POWER PLANT ENGINEERING
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Discuss the various operations involved in coal handling plant.	CO1	14 Marks
		(OR)		
2.		Explain the construction and working of Steam power plant with a layout.	CO1	14 Marks

UNIT-II

3.	a)	Mention the advantages and disadvantages of a diesel power plant over a gas turbine power plant.	CO1	7 Marks
	b)	Sketch the schematic arrangement of an open cycle gas turbine plant and its performance.	CO4	7 Marks
		(OR)		
4.		Draw a neat layout of a diesel power plant and label all the components.	CO4	14 Marks

UNIT-III

5.	a)	Enlist the advantages and disadvantages of the hydroelectric power plant and discuss the layout of the plant.	CO2	7 Marks
	b)	Give an example for a low head turbine, a medium head turbine and a high head turbine.	CO1	7 Marks
		(OR)		
6.	a)	How nuclear reactors are classified?	CO1	7 Marks
	b)	Explain the working and characteristic features of a homogeneous reactor.	CO2	7 Marks

UNIT-IV

7.	a)	Draw the layout of MHD open cycle generator and explain its function of components.	CO2	7 Marks
	b)	Identify the important criteria while selecting the geothermal energy for a particular region.	CO3	7 Marks
		(OR)		
8.	a)	Explain the working principle of OTEC.	CO2	7 Marks
	b)	What are the different types of ocean thermal energy conversion system?	CO1	7 Marks

UNIT-V

9.	a)	Elaborate the fixed cost and operating cost of a power station.	CO6	7 Marks
	b)	What do you understand by nuclear pollution, give the bad effects of nuclear pollution?	CO5	7 Marks
		(OR)		
10.		A central power station has annual factors as follows. Load factor = 60%, Capacity factor = 40%, Use factor = 45%, Power station has a maximum demand of 15,000kW. Determine the annual energy production, reserve capacity over and above peak load and hours per year not in service.	CO6	14 Marks

CODE No.: 16BT70401 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations June - 2022

CELLULAR AND MOBILE COMMUNICATIONS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Using the concept of frequency reuse channels, derive the relation for frequency reuse distance 'D' as a function of reuse pattern and cell size.	CO2	7 Marks
	b)	Illustrate various criteria used to specify the performance of a cellular system.	CO1	7 Marks
		(OR)		
2.	a)	List the characteristics used to specify the uniqueness of mobile radio environment and brief about the model of transmission medium.	CO1	7 Marks
	b)	Explain how to improve system capacity and co-channel interference.	CO2	7 Marks

UNIT-II

3.	a)	Define diversity and explain the polarization diversity and time diversity.	CO6	7 Marks
	b)	Explain the design procedure of Omni-directional antenna system.	CO3	7 Marks
		(OR)		
4.	a)	What are different types of non co-channel interference explain.	CO2	7 Marks
	b)	Explain the design procedure of directional antenna system.	CO3	7 Marks

UNIT-III

5.	a)	What is foliage loss? Explain propagation over water (or) flat open area.	CO1	7 Marks
	b)	What are the characteristics of point to point prediction model?	CO3	7 Marks
		(OR)		
6.	a)	Analyze cell site antenna height.	CO6	7 Marks
	b)	Explain the procedure of mobile to mobile propagation.	CO1	7 Marks

UNIT-IV

7.	a)	What is handoff and dropped calls explain different types of hand off?	CO1	7 Marks
	b)	Identify the handoff algorithm which is more appropriate during unavailability of free channels when crossing a cell boundary.	CO5	7 Marks
		(OR)		
8.	a)	How traffic and channel assignment takes place explain?	CO4	7 Marks
	b)	What is frequency management explain fixed channel assignment?	CO4	7 Marks

UNIT-V

9.	a)	What are the main standards of 2G wireless technology and explain them?	CO1	7 Marks
	b)	Explain the GSM short message services architecture and write the advantages of GSM over CDMA.	CO6	7 Marks
		(OR)		
10.	a)	Differentiate physical layer of WCDMA-FDD and WCDMA-TDD standards.	CO6	7 Marks
	b)	Explain the frame structure of GSM system.	CO1	7 Marks

CODE No.: 16BT70402 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations, June - 2022

EMBEDDED SYSTEMS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Contrast RISC to CISC architectural features.	CO2	5 Marks
	b)	Discuss the role language plays in programming microcontrollers using suitable example.	CO5	9 Marks
		(OR)		
2.	a)	Classify embedded systems based on the word length of the microcontrollers embedded in them with an example for each category.	CO5	9 Marks
	b)	Classify SSI, MSI & LSI based microcontrollers.	CO2	5 Marks

UNIT-II

3.	a)	Discuss usage of movement instruction in MSP430 assembly programming.	CO3	9 Marks
	b)	Explain MSP430 Reset circuit in detail.	CO1	5 Marks
		(OR)		
4.	a)	Present the block diagram of clock module in MSP430F and summarize its usage.	CO3	9 Marks
	b)	Discuss MSP430 Arithmetic and Logical instructions.	CO1	5 Marks

UNIT-III

5.	a)	Develop Embed-c code for MSP430 to light LEDS with a constant pattern.	CO4	7 Marks
	b)	Paraphrase the importance of infinite loop usage in embedded programming.	CO6	7 Marks
		(OR)		
6.	a)	Explore the reason for keeping Interrupt Service Routines shorter.	CO6	7 Marks
	b)	Develop program for MSP430 to read input from a push button switch and switch on Led when the push button switch was pressed.	CO4	7 Marks

UNIT-IV

7.	a)	Present the block diagram of basic Timer 1 and discuss about associated counters and their configuration using BTCTL register.	CO1	7 Marks
	b)	Reproduce the block diagram of comparator A and list the bits that control its operation.	CO1	7 Marks
		(OR)		
8.	a)	Review the block diagram of Timer_A in MSP430 microcontroller.	CO1	7 Marks
	b)	Explore MSP430 Timers and importance of resolution of a timer.	CO1	7 Marks

UNIT-V

9.	a)	Distinguish FSM to CFSM models for co-design.	CO3	7 Marks
	b)	Discuss Key characteristics of various frameworks recommended by Internet Architecture Board under RFC7452.	CO4	7 Marks
		(OR)		
10.	a)	Illustrate VLIW architecture choice for co-design implementation.	CO3	7 Marks
	b)	Summarize various IOT communication models using suitable examples.	CO4	7 Marks

CODE No.: 16BT70403 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations, June - 2022

MICROWAVE ENGINEERING

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Differentiate the E plane and H plane Tee. How they are used to combine or divide the microwave power?	CO2	7 Marks
	b)	Suggest a microwave device that can be used to measure unknown impedance. Derive its S-Matrix.	CO6	7 Marks
		(OR)		
2.	a)	Suggest a microwave device that can act as Duplexer.	CO6	7 Marks
	b)	Derive the S - matrix of an ideal E - plane Tee.	CO2	7 Marks

UNIT-II

3.	a)	Using velocity and current modulation explain the operation of a two-cavity Klystron Amplifier.	CO5	7 Marks
	b)	What is strapping in magnetron. How is the same effect obtained without strapping?	CO1	7 Marks
		(OR)		
4.	a)	Explain the operation of a reflex klystron using neat sketches of construction details and an Applegate diagram.	CO1	7 Marks
	b)	Using cross field effect, explain the operation of cylindrical travelling wave magnetron.	CO5	7 Marks

UNIT-III

5.	a)	A typical Si BARITT diode has the following specifications. Relative dielectric constant= 12.5 Donor concentration= $3.2 \times 10^{22}/m^3$ Length= 8 μm Calculate: i) critical voltage. ii) break down voltage. iii) break down electric field.	CO4	7 Marks
	b)	Use RWH theory and show how negative resistance is exhibited in solid state devices.	CO5	7 Marks
		(OR)		
6.	a)	Explain the modes of operation for Gunn diode.	CO1	7 Marks
	b)	A typical Gunn diode has the following specifications Operating frequency: 10 GHz Device length: 75 μm Voltage pulse amplified: 25 V Determine the threshold electric field.	CO4	7 Marks

UNIT-IV

7.	a)	Develop a bench setup for measuring Q factor of a cavity resonator.	CO3	7 Marks
	b)	Explain transmission method for measuring Q of a cavity resonator.	CO1	7 Marks
		(OR)		
8.	a)	Determine the attenuation for the given attenuator, if the power meter reads 10mW with attenuator and 26mW after removing it.	CO4	7 Marks
	b)	Develop the procedure for measuring high VSWR using slotted line section.	CO3	7 Marks

UNIT-V

9.	a)	Explain scattering phenomena.	CO1	7 Marks
	b)	Examine the effect of earth's magnetic field and curvature on the radio wave propagation.	CO2	7 Marks

(OR)

10.	a)	List out the modes of wave propagation for radio waves.	CO1	5 Marks
	b)	Determine the expression for reflection coefficients for horizontal polarization and for vertical polarization in ground wave propagation.	CO2	9 Marks

CODE No.: 16BT70406 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations, June - 2022

SATELLITE COMMUNICATIONS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain with the aid of diagrams, the launching procedure for geo-stationary satellites using launching vehicles.	CO1	7 Marks
	b)	Discuss the allocations of frequencies for Satellite Communications in the present era for various applications.	CO6	7 Marks
		(OR)		
2.	a)	Derive the expressions for Look angles for a geo-stationary satellite.	CO2	7 Marks
	b)	Discuss the orbital effects in communication system performance.	CO1	7 Marks

UNIT-II

3.	a)	Explain various techniques to derive necessary power during eclipse for a satellite system.	CO5	6 Marks
	b)	Design a satellite system for an EIRP of 100 dBW, a carrier frequency of 10 GHz and the distance between earth station and satellite of 36000Km. Calculate the CNR in 10MHz bandwidth if the ground station G/T is 20 dB/K.	CO3	8 Marks
		(OR)		
4.	a)	Calculate the gain and EIRP of a 3m paraboloidal antenna operating at a frequency of 6GHz. Assume an aperture efficiency of 0.6 and transmit power of 10 Watts	CO5	6 Marks
	b)	Draw the uplink and down link model for designing a satellite system for a specified C/N ratio and explain the procedure.	CO4	8 Marks

UNIT-III

5.	a)	Illustrate how unique word correlator is designed and used as a time marker for earth station transmission in TDMA	CO2	7 Marks
	b)	Describe TDMA frame structure with a neat block diagram	CO2	7 Marks
		(OR)		
6.	a)	Discuss Code Division Multiple Access Technique and what are the advantages of CDMA	CO5	8 Marks
	b)	Explain the advantages of TDMA technique giving an example	CO2	6 Marks

UNIT-IV

7.	a)	What are Non-geo stationary satellites, give some applications.	CO1	6 Marks
	b)	List the various operational NGSO constellation designs for various applications.	CO3	8 Marks
		(OR)		
8.	a)	Elaborate on various operational NGSO Constellation designs used in present era.	CO3	8 Marks
	b)	Discuss about Orbcomn satellites and its applications.	CO1	6 Marks

UNIT-V

9.	a)	Explain the GPS receiver design and operation using a block diagram.	CO4	7 Marks
	b)	What are the applications of Global Positioning navigation system? Explain giving examples the standard frequencies used for GPS.	CO6	7 Marks

(OR)

10.	a)	Identify the major sources of error in a GPS Receiver that calculates its position accurately.	CO4	7 Marks
	b)	Discuss about GPS signal levels and their timing accuracy with reference to the arrival of the code sequence at the receiver.	CO6	7 Marks

CODE No.: 16BT70407 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations, June - 2022

WIRELESS COMMUNICATION AND NETWORKS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Write short notes on: i) ARDIS. ii) RMD.	CO1	7 Marks
	b)	By applying Time Division Multiple Access technique, Illustrate 10 user network with the help of block diagram.	CO5	7 Marks
		(OR)		
2.	a)	Develop the architecture of a merged wired and wireless network and explain the routing process.	CO3	8 Marks
	b)	By applying Code Division Multiple Access technique, Illustrate 6 user network with the help of block diagram.	CO5	6 Marks

UNIT-II

3.	a)	List the features of wireless markup language.	CO1	7 Marks
	b)	Illustrate the evolution of Wireless Application Environment.	CO4	7 Marks
		(OR)		
4.	a)	Recall about wireless Application Protocol.	CO1	7 Marks
	b)	Illustrate how a mobile gets Co-located address in absence of foreign agent in a network.	CO4	7 Marks

UNIT-III

5.	a)	List the services of Wireless LANs.	CO1	7 Marks
	b)	Develop the layered protocol stack of WLAN and explain each protocol in detail.	CO3	7 Marks
		(OR)		
6.	a)	Design a WiMAX network and outline its routing process.	CO3	7 Marks
	b)	Analyze the functions of wireless LAN protocols.	CO2	7 Marks

UNIT-IV

7.	a)	Draw the Bluetooth architecture and explain the working of each layer.	CO1	7 Marks
	b)	Classify LLC and Adaptation protocol channels used in Bluetooth.	CO2	7 Marks
		(OR)		
8.	a)	Design a piconet with 8 users connected to form a Bluetooth network.	CO3	7 Marks
	b)	Compare Piconet and Scattering Network.	CO2	7 Marks

UNIT-V

9.	a)	Explain about forward channel and reverse channel in CDPD physical layer.	CO1	7 Marks
	b)	List the specifications of Data oriented CDPD network.	CO6	7 Marks
		(OR)		
10.	a)	Describe about short message servicing.	CO1	7 Marks
	b)	Discuss about HIPERLAN standards used in wireless networks.	CO6	7 Marks

CODE No.: 16BT70408 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations, June - 2022

LOW POWER CMOS VLSI DESIGN
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Briefly outline the need of low power VLSI chips in developing real electronics.	CO6	7 Marks
	b)	Construct the equivalent circuit for charging and discharging of CMOS inverter with its necessary equations and explain.	CO3	7 Marks
		(OR)		
2.	a)	Organize, how scaling is affected by technology?	CO6	7 Marks
	b)	Design a pseudo nMOS NOR gate and explain.	CO3	7 Marks

UNIT-II

3.	a)	Interpret the Data Correlation Analysis in evaluating the performance of DSP systems	CO5	7 Marks
	b)	Define Simulation and Analyze the importance of Simulation at various levels of abstraction with an example.	CO2	7 Marks
		(OR)		
4.	a)	Discuss in detail about Monto Carlo Simulation techniques.	CO5	7 Marks
	b)	Clearly explain the Dynamic events and static states of a 2-input CMOS NOR gate. Also discuss any two different implementations of NOR gate result in different dynamic energy dissipation events.	CO2	7 Marks

UNIT-III

5.	a)	Discuss the switching activity reduction techniques in CMOS digital Systems.	CO5	7 Marks
	b)	Explain local restructuring rules of transformation with relevant illustrations.	CO1	7 Marks
		(OR)		
6.	a)	Design a Flip-flop with Self gating technique also compare the performance of self gating and regular flip-flop.	CO5	7 Marks
	b)	Explain hardware architecture of State Machine Encoding with transition analysis.	CO1	7 Marks

UNIT-IV

7.	a)	Appraise two level clock tree using chip and package co design. Originate its use with respect to two level clock distributions.	CO1	7 Marks
	b)	Illustrate power reduction for clock signals by voltage swing reduction technique.	CO5	7 Marks
		(OR)		
8.	a)	What is Delay Balancing? Explain in detail about delay balancing with an example.	CO1	7 Marks
	b)	Classify different power reduction techniques in clock network.	CO5	7 Marks

UNIT-V

9.	a)	Estimate power dissipation in uniprocessing and parallel processing systems.	CO3	9 Marks
	b)	Compose the method of Charge sharing for half swing with its neat sketches.	CO4	5 Marks
		(OR)		
10.	a)	Design the flow graph transformation techniques used for the special purpose digital processing systems.	CO3	11 Marks
	b)	Discuss in detail control data flow and hardware architecture. Explain the flow graph transformation with operator reduction method.	CO4	3 Marks

CODE No.: 16BT70409 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations, June – 2022

RF ENGINEERING

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain briefly the importance of radio frequency design with the block diagram of a generic RF system.	CO6	6 Marks
	b)	Describe briefly how passive components are realized on printed circuit boards at RF.	CO2	8 Marks
		OR)		
2.	a)	Label the various reasons for using RF/Microwaves.	CO6	4 Marks
	b)	Calculate the skin depth for copper and aluminum at 0.86 and 1.2 GHz. Also find the resistance of an 8 CM wire with diameter of 1.5 mm. $\sigma_{cu} = 6.516 \times 10^6$ (s/m), $\sigma_{AL} = 40 \times 10^6$ (s/m).	CO2	10 Marks

UNIT-II

3.	a)	With the help of suitable derivation, explain power considerations for a transmission line.	CO2	8 Marks
	b)	Draw the lumped element circuit model for a transmission line. Derive the expression for voltage and current travelling waves.	CO5	6 Marks
		(OR)		
4.	a)	How input Impedance Z_{in} is determined from load Z_L using smith chart?	CO5	6 Marks
	b)	Explain how value and locations of Z_{max} and Z_{min} are determined from known load Z_L using smith chart.	CO2	8 Marks

UNIT-III

5.	a)	Draw the lumped element circuit model for a transmission line. Derive the expression for voltage and current travelling waves.	CO3	7 Marks
	b)	Describe shortly about Butterworth Filter.	CO1	7 Marks
		(OR)		
6.	a)	Explain the equivalent circuit of a transmission line.	CO3	7 Marks
	b)	Describe how a tunable RF active filter can be realized.	CO1	7 Marks

UNIT-IV

7.	a)	Evaluate stability at design frequency (RF).	CO4	7 Marks
	b)	Write a short note on low noise, linear RF BJT operation based on its structure.	CO1	7 Marks
		(OR)		
8.		Write short notes on: i) Low noise amplifiers. ii) VGA amplifiers.	CO1	14 Marks

UNIT-V

9.	a)	Describe mixer with neat block diagram.	CO4	7 Marks
	b)	Derive an expression for an open loop Q.	CO2	7 Marks
		(OR)		
10.	a)	What is Voltage Controlled Oscillator?	CO1	7 Marks
	b)	Describe in detail noise in PLL.	CO4	7 Marks

CODE No.: 16BT70410 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations, June - 2022

SPEECH PROCESSING
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	With suitable electrical representation, explain the various modules of a speech production system.	CO4	7 Marks
	b)	How to select a window width for processing speech signal.	CO2	7 Marks

(OR)

2.	a)	Show that $1 - az^{-1} = \frac{1}{\sum_{n=0}^{\infty} a^n z^{-1}}$ *if* $\|a\| < 1$.	CO2	8 Marks
	b)	What is digital excitation model and how it helps in generating an excitation signal for voiced speech.	CO4	6 Marks

UNIT-II

3.	a)	How zero crossing rate is used to discriminate speech and silence?	CO5	7 Marks
	b)	Explain the operation of simple pitch period estimators, with related block diagram and waveforms.	CO1	7 Marks

(OR)

4.	a)	Make use of zero crossing rate method to classify the speech signals into voiced, unvoiced signals. Mention its limitations.	CO5	7 Marks
	b)	What are the factors which have to be considered in automatic recognition of isolation during speech vs silence discrimination? Elaborate with two examples.	CO1	7 Marks

UNIT-III

5.	a)	Explain implementation of homomorphic systems in convolution and de-convolution operation of speech signal.	CO1	7 Marks
	b)	Describe the steps involved in defining a HMM model for isolated words.	CO1	7 Marks

(OR)

6.	a)	Define short time fourier transform and list out some of the its properties.	CO1	7 Marks
	b)	if the sequences $x(n)$ and $w(n)$ have the normal fourier transforms $X(e^{jw})$ and $w(e^{jw})$ the prove that short time fourier transform $X_n(e^{jw})$ is smoothed spectral estimate of fourier transforms $X(e^{jw})$.	CO3	7 Marks

UNIT-IV

7.	a)	Derive the solution for the auto correlation equations using Durbin's Recursive equation.	CO3	10 Marks
	b)	Compare the differences between the methods of solution of the LPC analysis equations.	CO2	4 Marks

(OR)

8.	a)	Discuss about tracking of formant using LPC.	CO4	7 Marks
	b)	Write a short note on solution of LPC equations.	CO1	7 Marks

UNIT-V

9.	a)	Develop continuous digit recognition system for societal needs.	CO6	8 Marks
	b)	Why is speaker identification more difficult than speaker verification?	CO2	6 Marks
		(OR)		
10.	a)	Compare quantitative and computational efficiency of speaker and speech recognition.	CO2	8 Marks
	b)	Recommend various effective measures of the features for speaker recognition.	CO6	6 Marks

CODE No.: 16BT71202 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations, June - 2022

MOBILE APPLICATION DEVELOPMENT
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Illustrate the circumstances that encourages the developer to develop a mobile web app.	CO1	9 Marks
	b)	Explain the effective usage of Mobile screen real estate.	CO1	5 Marks
		(OR)		
2.	a)	Classify the different ways of marketing a Mobile application.	CO2	9 Marks
	b)	Explain the benefits of a mobile application.	CO1	5 Marks

UNIT-II

3.	a)	Explain the procedure to linking two activities with Intents with a suitable example.	CO1	7 Marks
	b)	Illustrate how to detect the orientation changes and control the orientation of the activity.	CO1	7 Marks
		(OR)		
4.	a)	Develop an android program which returns result such as addition of two numbers from one activity screen that reads the two numbers to another activity screen.	CO3	9 Marks
	b)	Illustrate the steps to preserve the state information when changes made in screen orientation.	CO1	5 Marks

UNIT-III

5.	a)	Explain the procedure to handle the events generated by basic views.	CO1	7 Marks
	b)	Create an Android program to embed web content such as "Vidyanikethan.edu" in an Activity using WebView.	CO4	7 Marks
		(OR)		
6.	a)	Explain the procedure to display options Menu.	CO1	7 Marks
	b)	Develop an Android program to save user data to mobile internal storage.	CO3	7 Marks

UNIT-IV

7.		Develop an Android program to receive SMS message and display the messages using TextView.	CO6	14 Marks
		(OR)		
8.		Develop an Android program to download an image to mobile from server through internet.	CO6	14 Marks

UNIT-V

9.	a)	Discuss the procedure to create a hello world app in iOS.	CO5	7 Marks
	b)	Develop an Android application to perform repeated tasks in a Service using Timer class.	CO3	7 Marks
		(OR)		
10.	a)	Describe the components of a xCode IDE with a neat sketch	CO1	7 Marks
	b)	Create an Android application to auto stop a service using IntentService.	CO4	7 Marks

CODE No.: 16BT71205 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations, June - 2022

CRYPTOGRAPHY AND NETWORK SECURITY

[Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss the general model that reflects a concern for protecting an information system from unwanted access.	CO1	7 Marks
	b)	Compute the cipher text for the message "meet me after the party" with a rail fence of depth 2.	CO4	7 Marks
		(OR)		
2.	a)	Why are confidentiality, authentication and integrity important principles of security? Explain.	CO1	7 Marks
	b)	Write a short note on various types of cryptanalytic attacks.	CO1	7 Marks

UNIT-II

3.	a)	Explain public key cryptography and its characteristics.	CO1	7 Marks
	b)	Explain the technique that uses a hash function without Encryption for message authentication with a neat diagram.	CO4	7 Marks
		(OR)		
4.	a)	Differentiate between conventional and public key encryption techniques.	CO2	7 Marks
	b)	Construct RSA algorithm and find the value of cipher text for any plain text.	CO4	7 Marks

UNIT-III

5.	a)	Explain message authentication using one-way hash function.	CO1	7 Marks
	b)	Discuss the procedure for authentication using Kerberos version 5.	CO5	7 Marks
		(OR)		
6.	a)	Discuss the data protection by applying the new clause 43A under the amended IT act	CO6	7 Marks
	b)	In a public-key system using RSA, you intercept the cipher text $C = 10$ sent to a user whose public key is $e = 5$, $n = 35$.What is the plaintext M?	CO4	7 Marks

UNIT-IV

7.	a)	Explain about PGP key management in E-mail protection.	CO5	7 Marks
	b)	List differences between transport mode and tunnel mode encryption.	CO2	7 Marks
		(OR)		
8.	a)	Justify the need of compression after generating signatures and before message encryption in PGP	CO5	7 Marks
	b)	Differentiate SSL and TLS.	CO2	7 Marks

UNIT-V

9.	a)	With neat diagrams, explain the differences between application-level gateway and circuit -level gateway.	CO2	7 Marks
	b)	List how social engineering tactics are applied in revealing confidential information.	CO3	7 Marks
		(OR)		
10.	a)	"*One way to secure against Trojan horse attacks is the use of a secure, trusted OS"*. Justify.	CO5	7 Marks
	b)	Identify the key areas where ID theft can happen.	CO3	7 Marks

CODE No.: 16BT71501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations June - 2022

SYSTEM MODELING AND SIMULATION
[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Describe and discuss the different areas of simulation applications.	CO2	7 Marks
	b)	Explain in detail Steps in a simulation Study with neat sketch using one example.	CO1	7 Marks

(OR)

2.	a)	Write and discuss the Event scheduling/Time Advance Algorithm**.**	CO2	7 Marks
	b)	How to handling the list of events and entities using Array List and Dynamic List.	CO1	7 Marks

UNIT-II

3.	a)	Briefly discuss the different R Language Loop Statements with suitable examples.	CO3	7 Marks
	b)	Write R Program to Read the number and to determine the given number is Strong or not.	CO3	7 Marks

(OR)

4.	a)	How to use correlation and covariance Statistic tests explain with suitable example?	CO3	7 Marks
	b)	What is a Function? How to pass the function arguments in R explain with an example?	CO3	7 Marks

UNIT-III

5.	a)	Define and explain the following with suitable examples: Discrete Random Variables.	CO1	7 Marks
	b)	Continuous Random Variables.	CO1	7 Marks

(OR)

6.	a)	A recent survey indicated that 82% of single women aged 25 years old will be married in their lifetime. Using the binomial distribution, find the probability that two or three women in a sample of twenty will never be married**.**	CO4	7 Marks
	b)	Explain in detail binomial discrete distribution model.	CO1	7 Marks

UNIT-IV

7.	a)	Explain simple Queuing model with neat sketch and also describe the characteristics of the Queuing model.	CO1	7 Marks
	b)	What are the different measured are used in Long Run Queuing performance.	CO2	7 Marks

(OR)

8.	a)	Describe and discuss the different properties used to Random number generation.	CO1	7 Marks
	b)	Use the linear congruential method to generate a sequence of three two-digit random integers and corresponding random numbers. Let $\mathbf{X_0=27, a=8, c=47,}$ and $\mathbf{m=100}$.	CO4	7 Marks

UNIT-V

9.		Briefly discuss different Multivariate and time series input models with suitable examples.	CO1	14 Marks

(OR)

10.	a)	Explain different steps used for Model building verification and validation.	CO1	7 Marks
	b)	The number of patrons staying at a small hotel on 20 successive nights was observed to be 20, 14, 21, 19, 14, 18, 21, 25, 27, 26, 22, 18, 13, 18, 18, 18, 25, 23, 20, 21. Fit both an AR(1) and an EAR(1) model to these data. Decide which model provides a better fit by looking at a histogram of the data.	CO6	7 Marks

CODE No.: 16BT71502 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC16) Supplementary Examinations June – 2022

SYSTEMS ENGINEERING
[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Draw a context diagram for a standard washing machine. Make sure to identify all of the external entities and label all of the interactions.	CO1	7 Marks
	b)	Write about extensive prototyping. When is it required?	CO1	7 Marks
		(OR)		
2.	a)	What is a "best system"? Discuss about performance and cost quarters of a best system.	CO2	7 Marks
	b)	What system functional elements? Write about the functional building blocks of a system.	CO5	7 Marks

UNIT-II

3.		Narrate the development of a systems engineering through the system life cycle.	CO3	14 Marks
		(OR)		
4.		Narrate how principal stages are associated with the system life cycle.	CO2	14 Marks

UNIT-III

5.		How is performance requirements formulated during concept exploration? Discuss.	CO1	14 Marks
		(OR)		
6.		How are requirement elicited during operational requirement analysis? Discuss.	CO1	14 Marks

UNIT-IV

7.	a)	What is use interface evaluation? How are user interfaces evaluated? Discuss phases.	CO1	10 Marks
	b)	Write about development Testing.	CO4	4 Marks
		(OR)		
8.	a)	Discuss how the test results are analyzed and evaluated.	CO1	10 Marks
	b)	What is a test failure? How is it mitigated?	CO4	4 Marks

UNIT-V

9.		Spot the place for production phase in system life cycle. Illustrate diagrammatically how the production phase overlaps with the system design phase.	CO5	14 Marks
		(OR)		
10.	a)	Narrate the salience of the problems that rise during transition process of an engineered system.	CO1	8 Marks
	b)	What are the advantages of configuration management? Why is it required for a engineered system?	CO6	6 Marks

CODE No.: 16BT71503 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations, June - 2022

DATA ANALYTICS
[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Briefly explain the essence of data analytics in real time.	CO1	7 Marks
	b)	Write a short note on the outputs of data mining.	CO1	7 Marks
		(OR)		
2.	a)	Analyze the considerations in understanding the data presented.	CO2	6 Marks
	b)	Draw the block diagram of data processing chain and explain it.	CO3	8 Marks

UNIT-II

3.	a)	What are the major criteria on which decision tree algorithms differ from each other?	CO2	7 Marks
	b)	Compare the major decision tree construction algorithms.	CO4	7 Marks
		(OR)		
4.		Create a decision tree for the following data set. The objective is to find the class category (loan approved or not).	CO4	14 Marks

Age	Job	House	Credit	Loan approved
Young	False	No	Fair	No
Young	False	No	Good	No
Young	True	No	Good	Yes
Young	True	Yes	Fair	Yes
Young	False	No	Fair	No
Middle	False	No	Fair	No
Middle	False	No	Good	No
Middle	True	Yes	Good	Yes
Middle	False	Yes	Excellent	Yes
Middle	False	Yes	Excellent	Yes
Old	False	Yes	Excellent	Yes
Old	False	Yes	Good	Yes
Old	True	No	Good	Yes
Old	True	No	Excellent	Yes
Old	False	No	Fair	No

UNIT-III

5.	a)	Define bayes Theorem. Explain naïve bayes model for classification.	CO4	7 Marks
	b)	Describe the process of clustering technique with suitable example.	CO1	7 Marks
		(OR)		
6.	a)	With an example explain naïve bayes model.	CO3	7 Marks
	b)	Demonstrate how association rules are created with suitable example.	CO4	7 Marks

UNIT-IV

7.	a)	Discuss the implications of Big Data on recent technologies.	CO1	7 Marks
	b)	Explain in detail the qualities of good data for decision making.	CO1	7 Marks
		(OR)		

8.		List the commands in DDL and DML. Write the DDL and DML queries for a library database.	CO4	14 Marks

UNIT-V

9.	a)	Discuss the need of Map-Reduce in Hadoop.	CO5	7 Marks
	b)	Define MongoDB. What is the need for MongoDB?	CO1	7 Marks

(OR)

10.		Discuss the following in MongoDB Query Language with relevant examples: i) Arrays. ii) Aggregate Functions. iii) MapReduce Functions.	CO6	14 Marks

CODE No.: 16BT71508 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations, June - 2022

INTERNET OF THINGS

[Computer Science and Engineering, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain layered architecture of IoT.	CO1	7 Marks
	b)	With a neat sketch, describe about logical design of IOT.	CO1	7 Marks
		(OR)		
2.	a)	Explain about communication models in IOT.	CO1	7 Marks
	b)	Discuss about enabling technologies in IOT.	CO2	7 Marks

UNIT-II

3.	a)	Give the difference between Arduino Due and Raspberry Pi Model B.	CO3	7 Marks
	b)	Describe the IOT applications for Smart Environments.	CO1	7 Marks
		(OR)		
4.	a)	Explain IOT devices with examples.	CO4	7 Marks
	b)	Describe Raspberry pi interfaces.	CO3	7 Marks

UNIT-III

5.	a)	Explain the types of sensor devices with example.	CO1	7 Marks
	b)	Discuss about MAC Addresses in Internet of Things.	CO3	7 Marks
		(OR)		
6.		List and explain Application layer protocols.	CO3	14 Marks

UNIT-IV

7.	a)	Differentiate service and level specification in IOT.	CO2	7 Marks
	b)	Explain functional view specifications in IOT.	CO3	7 Marks
		(OR)		
8.		List and explain the step wise design methodology for Smart City case study.	CO4	14 Marks

UNIT-V

9.	a)	Discuss about Fair schedulers.	CO2	7 Marks
	b)	Explain YARN Components in detail.	CO6	7 Marks
		(OR)		
10.		Describe MapReduce job execution workflow in Hadoop.	CO5	14 Marks

CODE No.:14BT80402 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech II Semester (SVEC14) Supplementary Examinations January – 2022

MIXED SIGNAL DESIGN

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the concept of switched capacitor square wave modulator.	CO1	7 Marks
	b)	Explain the concept of Bi-quad filters.	CO1	7 Marks
		(OR)		
2	a)	Discuss the non-ideal effects in switched capacitor.	CO1	7 Marks
	b)	Explain the operation of first order switched capacitor integrator.	CO1	7 Marks

UNIT-II

3	a)	Explain Dynamics of Simple Linear model type1 PLL.	CO1	7 Marks
	b)	Analyse the response of PLL Locked condition for small Transients using necessary Timing diagrams.	CO2	7 Marks
		(OR)		
4	a)	Discuss the Topology of PLL with necessary schematics.	CO2	7 Marks
	b)	Justify how XOR Gate as Phase detector.	CO2	7 Marks

UNIT-III

5	a)	Explain about the quantization noise modeling using stochastic approach.	CO2	7 Marks
	b)	What sampling-time uncertainty can be tolerated for a 16-bit A/D converter operating on an input signal from 0-20 KHz?	CO3	7 Marks
		(OR)		
6		List and explain performance limitations of data converters.	CO2	14 Marks

UNIT-IV

7	a)	Explain the speed estimation for charge redistribution using necessary schematics.	CO3	7 Marks
	b)	Explain the speed estimation for charge redistribution with the help of flow graph explain algorithmic converter.	CO3	7 Marks
		(OR)		
8	a)	Discuss 3-bit flash A/D converter with the help of schematic.	CO4	7 Marks
	b)	Discuss the limitation persisting in the design of flash A/D converter.	CO4	7 Marks

UNIT-V

9	a)	Explain First order A/D converter realization for switched capacitor.	CO4	7 Marks
	b)	Elaborate the error feedback structure for $\Delta\Sigma$ modulator.	CO4	7 Marks
		(OR)		
10	a)	Justify how quantization noise power is independent of sampling frequency.	CO4	7 Marks
	b)	Summarise oversampling advantages in code converter.	CO4	7 Marks

CODE No.:14BT5HS02 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech II Semester (SVEC14) Supplementary Examinations March – 2021

MANAGEMENT SCIENCE

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What is management? Explain the functions of management in detail.	CO1	7 Marks
	b)	Discuss the principles of scientific management.	CO1	7 Marks
		(OR)		
2	a)	Explain the steps in corporate planning process.	CO1	7 Marks
	b)	What is social responsibility? Explain the areas of social responsibility of business.	CO5	7 Marks

UNIT-II

3	a)	What are the steps in quality control programme?	CO1	7 Marks
	b)	What is material management? Discuss the objectives of material management.	CO2	7 Marks
		(OR)		
4	a)	Define Plant Layout. Compare process and product layouts.	CO1	7 Marks
	b)	What are the types of inventory? Explain their importance.	CO1	7 Marks

UNIT-III

5	a)	Write about role of HR manager in an organization.	CO1	7 Marks
	b)	What is job evaluation? Explain it briefly.	CO1	7 Marks
		(OR)		
6	a)	Describe the importance of Human Resource Management (HRM).	CO1	7 Marks
	b)	Explain about McGregor's theory X and theory Y.	CO1	7 Marks

UNIT-IV

7	a)	Define Entrepreneur. How they are helpful to the society?	CO4	7 Marks
	b)	Explain the role of Entrepreneurship in economic development.	CO4	7 Marks
		(OR)		
8		The data given below is about a project and its activities:	CO2	14 Marks

S. No.	1	2	3	4	5	6	7	8	9
Activity	1-2	1-3	2-4	3-4	4-6	5-6	3-5	5-7	6-7
Expected Time	6	8	7	12	3	5	7	11	10

i) Draw the project network.
ii) Mark the critical path.
iii) Find total project duration.

UNIT-V

9	a)	Discuss in detail about Total Quality Management (TQM).	CO3	7 Marks
	b)	What is Enterprise Resource Planning (ERP)? Explain it briefly.	CO5	7 Marks
		(OR)		
10	a)	Write short notes on Business Process Outsourcing (BPO).	CO3	7 Marks
	b)	Explain the role of IT in managerial decision making.	CO5	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech II Semester (SVEC14) Supplementary Examinations March – 2021

PRESTRESSED CONCRETE

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	Explain various losses of prestress in pre-tensioning and post-tensioning.	CO1	14 Marks

(OR)

2	Explain about materials used for prestressed concrete.	CO1	14 Marks

UNIT-II

3	A concrete beam of cross section 250 x 500mm spanning over 8m .The beam is prestressed by a straight cable with an eccentricity of 100mm from soffit and 5 number of 7mm diameter wires subjected to a stress of 1250N/mm^2. The live load on the beam is 2 KN/m. Draw the stress distribution diagram at the central section for following. i) prestress + selfweigth ii) prestress + selfweigth + live load Take the density of concrete as 24 KN/m^3	CO2	14 Marks

(OR)

4	A simply supported prestressed concrete beam spanning over 10m is of rectangular cross section 500mm wide by 750mm deep the beam is prestressed by a parabolic cable having an eccentricity of 200mm at the centre of the span and zero at end supports. The effective force in the cable is 1600kN. If the beam supports a total uniformly distributed load of 40kN/m including selfweight,		
	i) evaluate the extreme fibre stresses at the mid span section.	CO2	7 Marks
	ii) calculate the force required in the cable having the same eccentricity to balance a total load of 50kN/m on the beam.	CO2	7 Marks

UNIT-III

5	A double T section having a flange 1200mm wide and 150mm thick is prestressed by 4700mm^2 of high tensile steel located at an effective depth of 1600mm. The ribs have a thickness of 150mm each. If the cube strength of concrete is 40N/mm^2 and tensile strength of steel is 1600N/mm^2, determine the flexural strength of the double T girder using IS 1343 provisions.	CO3	14 Marks

(OR)

6	The support section of a prestressed concrete beam, 100mm wide and 300mm deep is required to support an ultimate shear force of 80KN. The compressive prestresss at the centrodial axis is 5N/mm^2. The characteristic cube strength of concrete is 40N/mm^2. The cover to the tension reinforcement is 50mm. If the characteristic tensile strength of steel in 220N/mm^2, design shear reinforcement at the section.	CO2	14 Marks

UNIT-IV

7	Explain Guyon's method to calculate bursting tension in case of evenly distributed forces and in case of forces not evenly distributed.	CO1	14 Marks

(OR)

8	Write a note on anchorage zone reinforcement with neat figures.	CO1	14 Marks

UNIT-V

9	Determine the short term deflection and maximum deflection arising in pre–stressed concrete beam for the following data. span = 15m, Cross section area = 300 x 600mm Area of steel = 600mm^2 Stress = 100Mpa Density of concrete = 24kN/m^3. Elastic modulus of composite = 42 Gpa.	CO2	14 Marks
	(OR)		
10	Explain short term deflections of uncracked members.	CO1	14 Marks

CODE No.:14BT80102 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech II Semester (SVEC14) Supplementary Examinations March - 2021

ESTIMATION, COSTING AND VALUATION

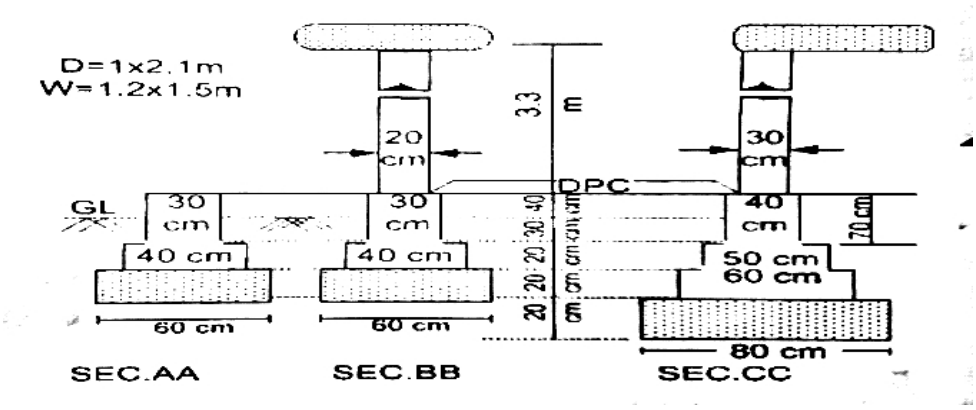
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the arch masonry calculations for various types of arches.	CO1	7 Marks
	b)	Explain the methods of estimating.	CO1	7 Marks
		(OR)		
2	a)	Define Estimating and list out the methods of estimating.	CO1	4 Marks
	b)	Estimate the quantities of the building from the given plan and section as shown in figure. i) Stone masonry for substructure. ii) Outside plastering in CM (1: 5) with 20 mm thickness.	CO2	10 Marks



UNIT-II

3	a)	How can the number of main bars and distribution bars in slabs be found out? Mention the formula.	CO2	3 Marks
	b)	Prepare a detailed estimate for supplying and laying 175mm dia glazed stone ware pipe for 100m length joining with 1:1.5 cement mortar including trenching up to a depth of 85cm. Estimate should be prepared to include all materials. (take length of pipe is 60cm)	CO2	11 Marks
		(OR)		
4		Prepare a detailed estimate for supplying, laying and jointing 200mm diameter glazed stone ware pipe line jointing with 1:2 cement mortar. Measurement of trench is 120m x 0.6m x 0.6m.	CO1	14 Marks

UNIT-III

5		Write the detailed specifications for the following items. i) Mosaic flooring. ii) Plastering. iii) RCC work in detail.	CO1	14 Marks
		(OR)		
6	a)	What is the purpose and method of writing specification? Describe briefly general and detailed specification.	CO1	7 Marks
	b)	Write detail specification of RCC (1:2:4) for beam concrete and painting for walls.	CO1	7 Marks

UNIT-IV

7	a)	Prepare a contract document for giving a building on lease.	CO3	10 Marks
	b)	Discuss in brief about different contracts.	CO1	4 Marks
		(OR)		
8	a)	Prepare a tender schedule for a school building to be executed on behalf of Department of Higher Education.	CO3	7 Marks
	b)	Write note on Arbitration and legal requirements.	CO3	7 Marks

UNIT-V

9	a)	What do you mean by valuation and explain various purposes of valuation.	CO1	10 Marks
	b)	Explain capitalized value with example.	CO4	4 Marks
		(OR)		
10	a)	What is Obsolescence?	CO1	2 Marks
	b)	Explain the methods of calculating the depreciation.	CO1	12 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech II Semester (SVEC14) Supplementary Examinations March – 2021

HVDC AND FACTS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Discuss the technical advantages of DC over AC transmission.	CO1	7 Marks
	b)	What are the types of HVDC links? Explain.	CO1	7 Marks
		(OR)		
2	a)	With neat sketches, explain the different kinds of DC links available.	CO1	7 Marks
	b)	Explain the effect of overlap angle on the performance of converter circuit. Explain the combined characteristics of rectifier and inverter.	CO1	7 Marks

UNIT-II

3	a)	Explain the process of starting and stopping of a DC link in HVDC system.	CO1	7 Marks
	b)	Explain in detail the convertor control characteristics of HVDC systems.	CO2	7 Marks
		(OR)		
4	a)	Explain the hierarchical control structure of a DC link with the help of a block diagram.	CO2	7 Marks
	b)	Discuss the current and extinction angle control.	CO4	7 Marks

UNIT-III

5	a)	What are the causes of reactive power deficit in power systems? Explain.	CO1	7 Marks
	b)	Explain the power flow in AC transmission with meshed connections.	CO1	7 Marks
		(OR)		
6		Explain the basic types of FACTS controllers and their relative importance.	CO2, CO3	14 Marks

UNIT-IV

7		Explain the methods of controllable VAR generation.	CO3	14 Marks
		(OR)		
8	a)	Explain the control scheme of STATCOM.	CO2	7 Marks
	b)	Explain the operation of TCSC.	CO2	7 Marks

UNIT-V

9	a)	Differentiate between UPFC and IPFC.	CO2	7 Marks
	b)	Explain how UPFC is different from VSC.	CO2	7 Marks
		(OR)		
10	a)	Explain basic operating principle and control structure of a UPFC.	CO1	7 Marks
	b)	Explain the role of IPFC in real and reactive power flow control.	CO2	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech II Semester (SVEC14) Supplementary Examinations March – 2021

MECHATRONICS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Identify and explain the areas where Mechatronics system can be used.	CO1	7 Marks
	b)	Explain the advantages and disadvantages of the Mechatronics system.	CO1	7 Marks
		(OR)		
2	a)	Differentiate between the traditional and Mechatronic design with an example.	CO1	7 Marks
	b)	Explain any two types of Mechatronic system applications.	CO1	7 Marks

UNIT-II

3	a)	Distinguish between Hydraulics and Pneumatics systems.	CO1	4 Marks
	b)	What is Electro-mechanical transient performance? Derive mathematical solution for linear torque-speed characteristic.	CO2	10 Marks
		(OR)		
4		Write about:		
		i) Piezoelectric actuators.	CO3	5 Marks
		ii) DC servo motor.	CO3	5 Marks
		iii) Stepper Motors.	CO3	4 Marks

UNIT-III

5		Write about the following filters and draw the characteristics along with their working i) Band filters. ii) Band stop.	CO3	14 Marks
		(OR)		
6		Write about the following filters and draw the characteristics along with the working i) Low pass filters. ii) High pass filters. iii) Notch filter.	CO3	14 Marks

UNIT-IV

7	a)	Explain the working principle of DC convertor with a neat sketch. And discuss the-application.	CO3	9 Marks
	b)	Recognize the factors needed for selection of a micro controller.	CO3	5 Marks
		(OR)		
8	a)	List any two applications with examples how microcontrollers are used.	CO3	7 Marks
	b)	Identify the factors needed to selecting a microcontroller.	CO1	7 Marks

UNIT-V

9	a)	Develop the following ladder diagrams i) Timer. ii) Internal relay. iii) Counter.	CO4	9 Marks
	b)	Explain the working principle of Proportional controller, P; with a neat sketch.	CO4	5 Marks
		(OR)		
10	a)	Discuss the selection criteria of PLC.	CO4	6 Marks
	b)	Explain the basic structure of PLC with a neat sketch.	CO4	8 Marks

CODE No.:14BT80401 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech II Semester (SVEC14) Supplementary Examinations March – 2021

CELLULAR AND MOBILE COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the performance criteria of a cellular system.	CO1	7 Marks
	b)	List the Analog and Digital cellular systems.	CO1	7 Marks
		(OR)		
2	a)	Explain the concept of frequency reuse channels.	CO2	7 Marks
	b)	Explain the consideration of components of cellular systems.	CO1	7 Marks

UNIT-II

3	a)	Explain the method for finding the antenna height gain.	CO2	7 Marks
	b)	What are the effects of cell site antennas?	CO2	7 Marks
		(OR)		
4	a)	Derive the transfer function of propagation channel.	CO2	7 Marks
	b)	What are the characteristics of antenna structures?	CO2	7 Marks

UNIT-III

5	a)	How interference is avoided in numbering and grouping the channels?	CO1	7 Marks
	b)	Compare the performance of Omni cell and sectorized cells.	CO2	7 Marks
		(OR)		
6	a)	Why handoffs are necessary and describe its types?	CO2	7 Marks
	b)	What is a dropped call and how are these evaluated?	CO2	7 Marks

UNIT-IV

7	a)	Explain the effect of large PAPR on the features of OFDM system.	CO1	7 Marks
	b)	Explain two coding techniques used in cellular systems.	CO1	7 Marks
		(OR)		
8	a)	Explain about QPSK modulation technique along with constellation diagram. Why OQPSK is preferred over QPSK?	CO1	7 Marks
	b)	What are the advantages of Orthogonal Frequency Division Multiplexing for digital transmissions over channel subject to fading?	CO2	7 Marks

UNIT-V

9	a)	Sketch forward control channel block diagrams for IS-95.	CO1	7 Marks
	b)	Compare TDMA and CDMA schemes, identifying the advantages of each scheme over the other.	CO1	7 Marks
		(OR)		
10	a)	Illustrate the distinction between hard and soft handoff. Why does soft handoff provide a performance improvement in CDMA systems?	CO1	7 Marks
	b)	Provide a diagram showing how a call is set up in IS-136. Explain.	CO2	7 Marks

CODE No.:14BT80403 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech II Semester (SVEC14) Supplementary Examinations March - 2021

SATELLITE COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Draw the geometry of geostationary link showing elevation azimuth and range and also derive the expression for elevation and azimuth angle.	CO1	7 Marks
	b)	A geostationary satellite moving in an equational circular orbit is at a height of a 5786 km from the earth surface. If the earth radius is taken as 6378 km. Determine the theoretical maximum coverage angle and maximum slant range.	CO2	7 Marks
		(OR)		
2	a)	What are the Kepler's three laws of planetary motion? Give the mathematical formulation of Kepler's third law of planetary motion.	CO1	7 Marks
	b)	A low earth orbit satellite is in a circular polar orbit with an altitude **h**, of 1000km. A transmitter on the satellite has a frequency of 2.65GHz. Find i) The velocity of the satellite in orbit. ii) The component of velocity toward an observer at an earth station as the satellite appears over the horizon, for an observer who is in the plane of the satellite orbit. iii) Hence, find the Doppler shift of the received signal at the earth station. Use a mean earth radius value, r_e, of 6378 km.	CO4	7 Marks

UNIT-II

3	a)	A satellite is in an elliptical orbit with a perigee of 1000 km and an apogee of 4000 km. Find the period of the orbit and eccentricity of the orbit, assuming the mean earth radius as 6378.14 km.	CO4	7 Marks
	b)	Discuss about various satellite services.	CO1	7 Marks
		(OR)		
4	a)	In a satellite link, the propagation loss is 200 dB. Margins and losses account for another 3 dB. The receiver [G/T] is 11dB and the [EIRP] is 45dB W. Calculate the received [C/N] for a system band width of 36MHz.	CO3	6 Marks
	b)	Explain in brief telemetry, tracking and command of the satellite system.	CO1	8 Marks

UNIT-III

5	a)	Explain in detail about TDMA Frame Structure.	CO1	7 Marks
	b)	Describe FDMA structure with a neat block diagram and explain advantages of FDMA over TDMA.	CO4	7 Marks
		(OR)		
6	a)	With the help of a neat diagram, explain Frequency Hop Spread Spectrum.	CO1	7 Marks
	b)	Design Cassegrain antenna to transmit 5KW power at 6 GHz with gain of 84dB. Choose the diameter as 10m and calculate the efficiency.	CO2	7 Marks

UNIT-IV

7	a)	Analyze and discuss the Delay and Throughput considerations in a satellite system.	CO2	7 Marks

	b)	Summarize the advantages and disadvantages of low and medium earth orbits.	CO1	7 Marks
		(OR)		
8	a)	Compare geostationary and geosynchronous satellites.	CO1	7 Marks
	b)	An earth station antenna has a diameter of 30m, has an overall efficiency of 68% and is used to receive a signal at 4150 MHz Calculate gain of the antenna.	CO3	7 Marks

UNIT-V

9	a)	Explain GPS Position location Principles and their operation in satellite navigation.	CO1	7 Marks
	b)	Describe the process of GPS receiver operation.	CO1	7 Marks
		(OR)		
10	a)	Discuss about the following: i) GPS Navigation Message ii) GPS Signal Levels	CO1	7 Marks
	b)	Explain GPS Receivers and Codes with suitable sketches.	CO4	7 Marks

CODE No.:14BT80502 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech II Semester (SVEC14) Supplementary Examinations March - 2021

BIG DATA

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Identify the requirements for analytical model.	CO1	7 Marks
	b)	Define Missing Values also identify the schemes to deal with missing values.	CO1	7 Marks
		(OR)		
2	a)	Define Big Data and Explain its characteristics briefly.	CO1	7 Marks
	b)	Write basic nomenclature for Big Data Analytics.	CO1	7 Marks

UNIT-II

3	a)	Explain Hadoop Ecosystem.	CO2	7 Marks
	b)	Explain Building blocks of Hadoop.	CO2	7 Marks
		(OR)		
4		What are the components of the Hadoop ecosystem in the market and list out their applications?	CO1	14 Marks

UNIT-III

5		Illustrate Anatomy of Map Reduce with a neat sketch.	CO1	14 Marks
		(OR)		
6	a)	Explain failures in Map Reduce.	CO1	7 Marks
	b)	Differentiate Map reduce 1.0 and 2.0.	CO1	7 Marks

UNIT-IV

7	a)	Illustrate with an example different clauses supported by HiveQL.	CO1	7 Marks
	b)	Identify the importance of aggregate functions of HiveQL.	CO2	7 Marks
		(OR)		
8	a)	Define an expression and explain different expressions supported by Pig.	CO1	7 Marks
	b)	Identify the importance of Data Processing Operators of Pig.	CO2	7 Marks

UNIT-V

9	a)	Explain Hadoop usage at Last.fm.	CO1	7 Marks
	b)	Explain Data Architecture at Facebook.	CO1	7 Marks
		(OR)		
10		Explain Nutch Search Engine with its data structures and Architecture.	CO1	14 Marks

CODE No.:14BT81202 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech II Semester (SVEC14) Supplementary Examinations March – 2021

CRYPTOGRAPHY AND NETWORK SECURITY

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Distinguish between passive attacks an active attacks.	CO1	7 Marks
	b)	Discuss about various security services.	CO1	7 Marks
		(OR)		
2	a)	Illustrate with an example on each of the Caesar Cipher and Playfair Cipher.	CO1	8 Marks
	b)	Briefly explain transposition technique.	CO2	6 Marks

UNIT-II

3	a)	List out various requirements to be necessary for Pubic-key Cryptography.	CO1	5 Marks
	b)	Discuss about DES Algorithm.	CO1	9 Marks
		(OR)		
4		Discuss Diffie-Hellman key exchange and using that with a common prime q=11and a primitive root n = 2. i) Show that 2 is a primitive root of 11. ii) If user A has public key $Y_A = 9$, what is A's private key X_A? iii) If user B has public key $Y_A = 3$, what is the shared secret key K, shared with A?	CO2	14 Marks

UNIT-III

5	a)	Elaborate various Message Authentication functions.	CO1	8 Marks
	b)	Discuss about X.509 Authentication Service.	CO1	6 Marks
		(OR)		
6	a)	Discuss about Secure Hash Algorithm.	CO1	7 Marks
	b)	What is a Digital Signature Standard? Explain its algorithm.	CO1	7 Marks

UNIT-IV

7	a)	Sketch the general format of a PGP Message.	CO1	6 Marks
	b)	Describe the classes of security for public-key certificates provided by VeriSign.	CO2	8 Marks
		(OR)		
8	a)	Briefly discuss about the format of an Encapsulating Security Payload packet.	CO1	7 Marks
	b)	Discuss about features and components of Secure Electronics Transaction.	CO2	7 Marks

UNIT-V

9	a)	What are typical phases of operations of a virus or worm? Explain.	CO2	7 Marks
	b)	What is the role of encryption in the operation of a virus? Explain.	CO2	7 Marks
		(OR)		
10	a)	Illustrate Transport and Tunnel modes for IPv4 and IPv6 packets of ESP with neat diagrams.	CO1	7 Marks
	b)	What is the difference between statistical anomaly detection and rule-based intrusion detection?	CO2	7 Marks

CODE No.:14BT81204 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech II Semester (SVEC14) Supplementary Examinations March – 2021

INFORMATION RETRIEVAL SYTEMS

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define an Information Retrieval System. Describe the functional overview of Information Retrieval Systems.	CO1	9 Marks
	b)	Show the variations in Precision and Recall with a graph while retrieving relevant and non-relevant items.	CO2	5 Marks
		(OR)		
2	a)	Describe the types of data structures used in Information Retrieval System and explain Inverted File data structure.	CO1	7 Marks
	b)	What is a Latent Semantic Indexing (LSI)? How to perform Single Value Decomposition using matrix.	CO1	7 Marks

UNIT-II

3	a)	Compare advantages and disadvantages of porter Stemming algorithm, Dictionary Stemming algorithm and Success Variety stemming algorithm.	CO2	7 Marks
	b)	What is Indexing? Explain Manual Indexing process.	CO1	7 Marks
		(OR)		
4	a)	Write short notes on: i) Categorization. ii) CitationMetadata.	CO1	7 Marks
	b)	Briefly discuss the automatic Indexing of multimedia items.	CO1	7 Marks

UNIT-III

5	a)	Distinguish term clustering and item clustering. Explain with suitable examples	CO1	7 Marks
	b)	What is the need of Thesaurus in a document and how it can be generated?	CO2	7 Marks
		(OR)		
6	a)	Why is relevance feedback required in User Search Techniques? Explain.	CO1	8 Marks
	b)	Describe briefly why Search Statements and Binding are required.	CO2	6 Marks

UNIT-IV

7	a)	What is information visualization? Discuss the different areas of information visualization and presentation.	CO1	7 Marks
	b)	Explain in detail aspects of the visualization process.	CO1	7 Marks
		(OR)		
8	a)	Explain multimedia item presentation.	CO1	7 Marks
	b)	Briefly discuss any two presentations of hits.	CO1	7 Marks

UNIT-V

9	a)	Discuss about Hardware Text Search system with a block diagram.	CO1	7 Marks
	b)	Sketch and discuss the GOOGLE Scalable Multiprocessor Architecture.	CO1	7 Marks
		(OR)		
10		Explain Information System and Measures Used in System Evaluations.	CO1	14 Marks

CODE No.:14BT80301 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech II Semester (SVEC14) Supplementary Examinations May - 2022

PRODUCTION & OPERATIONS MANAGEMENT

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Write in brief notes on evolution and scope of operation management.	CO2	7 Marks
	b)	Explain how System and transformation play a key role in operations management.	CO2	7 Marks

(OR)

2	a)	Explain how managerial factors and quality of life factors affect the productivity.	CO3	7 Marks
	b)	What are production system decisions and why do we put such emphasis on these things?	CO3	7 Marks

UNIT-II

3	a)	Explain various types of forecasting with respect to time horizon.	CO2	7 Marks
	b)	What is forecast error and how to reduce the error in forecast?	CO2	7 Marks

(OR)

4	a)	Discuss any two forecasting methods with their limitations.	CO2	7 Marks
	b)	Estimate the future demand through simple regression method for 2020, 2022, 2024 and 2026 for the following details.	CO3	7 Marks

Time(Year)	2010	2012	2014	2016	2018
Demand	5.0	5.6	6.7	5.8	6.9

UNIT-III

5		Explain in detail about level, chase and mixed strategies used for aggregate production planning along with their limitations.	CO5	14 Marks

(OR)

6	a)	What is Master production scheduling? List out the inputs and outputs of MPS.	CO1	7 Marks
	b)	Write a short note on aggregate capacity planning and its need.	CO1	7 Marks

UNIT-IV

7		Differentiate between ERP, MRP and MRP-II and explain with examples	CO4	14 Marks

(OR)

8		Write a short notes on pull method of material flow, small lot sizes, uniform work station loads and line flows.	CO5	14 Marks

UNIT-V

9	a)	What is flow shop scheduling and give the algorithm for Johnson's rule for n job and 2 machines.	CO4	7 Marks
	b)	Discuss the heuristic procedure for job shop scheduling.	CO4	7 Marks

(OR)

10	a)	Explain the role of information technology in Supply Chain Management.	CO4	7 Marks
	b)	Discuss about the components and structure of Supply Chain Management.	CO4	7 Marks

CODE No.:14BT80305 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech II Semester (SVEC14) Supplementary Examinations May - 2022

ADVANCED CASTING TECHNOLOGY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the recent trends in quality specifications required for foundry Industry.	CO1	7 Marks
	b)	Describe the pattern allowances in detail.	CO2	7 Marks
		(OR)		
2	a)	Discuss the properties and applications of Zn-Alloys.	CO1	7 Marks
	b)	Explain the design principles of dies in centrifugal casting.	CO2	7 Marks

UNIT-II

3	a)	Describe the types and uses of filters.	CO2	7 Marks
	b)	Explain the solidification of eutectic alloys.	CO1	7 Marks
		(OR)		
4	a)	Discuss Computer aided design of Risers.	CO2	7 Marks
	b)	What is directional solidification? Explain its significance and factors affecting them.	CO2	7 Marks

UNIT-III

5	a)	Discuss all the formulas used to calculate the gating system dimensions.	CO2	7 Marks
	b)	What is meant by skin dried mouds? Explain its applications.	CO4	7 Marks
		(OR)		
6	a)	Explain about vacuum degassing methods.	CO3	7 Marks
	b)	Explain any two sand testing methods.	CO4	7 Marks

UNIT-IV

7	a)	Explain the advantages and applications of Resin bonded sands.	CO3	7 Marks
	b)	Explain ceramic molding.	CO3	7 Marks
		(OR)		
8	a)	Explain vacuum molding.	CO3	7 Marks
	b)	Discuss about Monorail and Auto pour systems.	CO1	7 Marks

UNIT-V

9		Describe the investment casting process, its merits and applications.	CO3	14 Marks
		(OR)		
10	a)	Illustrate the die casting process with applications.	CO3	7 Marks
	b)	Describe the defects in centrifugal casting.	CO3	7 Marks

CODE No.:14BT80402 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech II Semester (SVEC14) Supplementary Examinations May - 2022

MIXED SIGNAL DESIGN

[Electronics And Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What is meant by bi-quad filter and derive the transfer function equation for low Q bi-quad filters?	CO1	7 Marks
	b)	For the above circuit if clock frequency is 100 kHz, find the capacitor value that will emulate 1M ohm resistor.	CO3	7 Marks
		(OR)		
2	a)	Explain about different building blocks in switched capacitor circuits.	CO1	7 Marks
	b)	Explain about non ideal effects in switched capacitor circuits.	CO1	7 Marks

UNIT-II

3	a)	Justify how a Master-Slave D-Flipflop can be operated as a Phase/ Frequency Detector.	CO1	7 Marks
	b)	Discuss the Lock Acquisition Problems in PLL's.	CO1	7 Marks
		(OR)		
4	a)	Explain Jitter in PLL, using timing diagrams how they can be reduced.	CO2	7 Marks
	b)	Explain the concept of simple Charge-pump PLL.	CO2	7 Marks

UNIT-III

5	a)	Using stochastic approach, evaluate the average value of quantization fault and hence deduce the signal to noise ratio for an ADC.	CO2	7 Marks
	b)	Illustrate Thermometer-code converters.	CO1	7 Marks
		(OR)		
6	a)	Summarize Noise quantization in data concepts with necessary schematic.	CO3	7 Marks
	b)	Discuss charge-redistribution in thermometer based D/A converter.	CO3	7 Marks

UNIT-IV

7	a)	Sketch the Flow Graph for the Successive-Approximation approach and Explain the Convertion Process.	CO3	7 Marks
	b)	Explain the operation of Integrating Converters for three different input voltages.	CO3	7 Marks
		(OR)		
8	a)	Explain the operation of the successive approximation approach with a flow graph.	CO1	7 Marks
	b)	Mention all kinds of medium speed and high speed ADC and explain the operation of a 4-bit interpolating A/D converter.	CO3	7 Marks

UNIT-V

9	a)	Discuss about noise shaped delta sigma modulators.	CO1	7 Marks
	b)	Contrast Decimating and interpolating filters.	CO2	7 Marks
		(OR)		
10	a)	List and explain different architectures for higher order modulators.	CO2	7 Marks
	b)	Classify and compare delta sigma modulators with multibit quantizes.	CO2	7 Marks

CODE No.:14BT81202 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech II Semester (SVEC14) Supplementary Examinations May - 2022

CRYPTOGRAPHY AND NETWORK SECURITY

[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	List and explain specific and pervasive security mechanisms.	CO1	7 Marks
	b)	What is the difference between active and passive security attacks?	CO1	7 Marks
		(OR)		
2	a)	Encrypt the message "Must see you over cardigan west" using Playfair and Hill ciphers.	CO1	7 Marks
	b)	With an example explain the cryptanalysis of Playfair and Hill ciphers.	CO2	7 Marks

UNIT-II

3	a)	Demonstrate the following operations of AES algorithm with suitable examples: i) Add Round Key. ii) Byte Substitution. iii) Mix Columns.	CO1	7 Marks
	b)	Summarize avalanche effect on DES.	CO1	7 Marks
		(OR)		
4	a)	In a public-key system using RSA, you intercept the ciphertext $C = 10$ sent to a user whose public key is $e = 5$, $n = 35$.What is the plaintext M?	CO2	7 Marks
	b)	Man-in-the-middle attack on the Diffie-Hellman key exchange protocol in which the adversary generates two public-private key pairs for the attack. Could the same attack be accomplished with one pair? Justify.	CO1	7 Marks

UNIT-III

5	a)	Illustrate CMAC with neat diagram.	CO1	7 Marks
	b)	Illustrate Signing and verifying functions of Digital Signature DSS algorithm with neat diagrams.	CO1	7 Marks
		(OR)		
6	a)	Analyze Collision-Resistant Attack on Hash Function.	CO1	7 Marks
	b)	Outline Simple Authentication Dialogue of Kerberos Version 4.	CO1	7 Marks

UNIT-IV

7	a)	Differentiate SSL and SET protocols.	CO2	8 Marks
	b)	Discuss the various web security requirements.	CO1	6 Marks
		(OR)		
8	a)	Describe the SSL Specific protocol - Handshake action in detail.	CO1	7 Marks
	b)	Discuss the Principles of Remote User Authentication.	CO1	7 Marks

UNIT-V

9		Explain firewall design principles, characteristics and types of firewalls.	CO1	14 Marks
		(OR)		
10	a)	Explain about the routing applications of IPSec.	CO1	6 Marks
	b)	List and explain the services of PGP.	CO1	8 Marks

CODE No.:16MC10103 SVEC16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.C.A. I Semester (SVEC16) Supplementary Examinations August – 2021

PROGRAMMING IN C

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Write about the structure of C program with suitable example.	6 Marks
	b)	Sketch the block diagram to create and run the C program in Turbo C.	6 Marks
		(OR)	
2.	a)	Label any two major components of a computer system.	6 Marks
	b)	Identify the steps in creating and running a C program.	6 Marks

UNIT-II

3.	a)	What is two-dimensional array? How they are stored in memory?	6 Marks
	b)	Explain Memory Allocation Functions with suitable example.	6 Marks
		(OR)	
4.	a)	Write a C Program to swap two elements without using third variable.	6 Marks
	b)	Differentiate "if" statement and "if - else" statement with an example program.	6 Marks

UNIT-III

5.	a)	State which value is automatically assigned to those array elements that are not explicitly initialized with an example.	5 Marks
	b)	State various types of functions used in C.	7 Marks
		(OR)	
6.	a)	Formulate n^{th} Fibonacci number generation using recursion.	6 Marks
	b)	Define function and explain about system defined functions with suitable example.	6 Marks

UNIT-IV

7.	a)	Argue about Enumerated types in C with an example for creating Colors type.	3 Marks
	b)	Explain about nested structure with an example.	4 Marks
	c)	Differentiate structures and Unions in C.	5 Marks
		(OR)	
8.		How to declare structure and its variables? Specify accessing operators for structures.	12 Marks

UNIT-V

9.	a)	Relate conditional Preprocess directives with suitable example.	7 Marks
	b)	Specify various access modes for text files.	5 Marks
		(OR)	
10.		Write a C program to demonstrate sequential file access.	12 Marks

CODE No.: 19MC10101 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. I Semester (SVEC-19) Supplementary Examinations August - 2021

COMPUTER ORGANIZATION

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Draw and explain the block diagram of a digital computer.	6 Marks	L2	CO1	PO1 PO3
	b)	Give a brief note on the following: i) Computer Organization. ii) Computer Design. iii) Computer Architecture.	6 Marks	L1	CO2	PO1 PO2
		(OR)				
2.		Construct Binary Counter with Parallel Load and explain.	12 Marks	L3	CO2	PO1 PO2 PO3
		UNIT-II				
3.		Discuss in detail the fixed-point representation with a suitable example.	12 Marks	L1	CO1	PO1 PO2
		(OR)				
4.		Relate different codes of digital computers with examples.	12 Marks	L1	CO1	PO1 PO2
		UNIT-III				
5.		Explain the computer hardware configuration of micro-programmed control unit with a diagram.	12 Marks	L2	CO1	PO1 PO2 PO3
		(OR)				
6.	a)	Define the fields that we can found in the instruction format. Explain different instruction formats in detail.	6 Marks	L1	CO1	PO1 PO2
	b)	Illustrate the importance of interrupt in the execution of a program.	6 Marks	L2	CO2	PO1 PO2 PO5
		UNIT-IV				
7.		Design the flowchart for interrupt cycle and explain.	12 Marks	L3	CO2	PO1 PO2 PO3
		(OR)				
8.	a)	Classify memory reference instructions.	6 Marks	L4	CO1	PO1 PO2
	b)	Explain briefly about the design of basic computer.	6 Marks	L2	CO2	PO2 PO3
		UNIT-V				
9.		Evaluate Input-Output-Processor (IOP) organization.	12 Marks	L4	CO2	PO1 PO2 PO5
		(OR)				
10.		Define cache memory. Explain different mapping procedures in the organization of cache memory with suitable example.	12 Marks	L2	CO2	PO1 PO2 PO3 PO5

CODE No.: 19MC10103 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. I Semester (SVEC-19) Supplementary Examinations August - 2021

OPERATING SYSTEMS

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		Determine the problems in design and implementation of Operating Systems.	12 Marks	L2	CO1	PO1 PO2
		(OR)				
2.		What is context switching? Categorize types of schedulers in Process Management. Explicate in detail about representation of process scheduling using Queuing diagram.	12 Marks	L1	CO2	PO1
		UNIT-II				
3.	a)	Identify various thread issues in multithreaded programming.	6 Marks	L1	CO1	PO1 PO4
	b)	Specify the role of the dispatcher. Describe Multiple-Processor Scheduling and its approaches.	6 Marks	L1	CO2	PO1 PO4
		(OR)				
4.		Distinguish between multilevel Queue and multilevel feedback queue scheduling algorithms.	12 Marks	L3	CO2	PO2 PO4
		UNIT-III				
5.	a)	Identify the requirements to be satisfied for a solution to the critical section problem.	6 Marks	L1	CO3	PO1 PO2
	b)	What are the methods for handling deadlocks?	6 Marks	L2	CO2	PO1 PO3
		(OR)				
6.	a)	How to handle dining philosophers problem using synchronization tool?	6 Marks	L3	CO3	PO2 PO4
	b)	Illustrate Banker's algorithm to avoid deadlock.	6 Marks	L2	CO2	PO1 PO2
		UNIT-IV				
7.		Elucidate Hierarchical paging and Inverted page Tables for structuring the page table.	12 Marks	L2	CO4	PO1
		(OR)				
8.		Calculate number of page faults for the following page reference String using optimal replacement algorithm with three frames allocated in memory: 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1	12 Marks	L3	CO4	PO1 PO2 PO5
		UNIT-V				
9.	a)	What are the principles of protection?	5 Marks	L2	CO5	PO1 PO2
	b)	Elucidate the following methods for implementing the access matrix: i) Global Table. ii) Access Lists for objects.	7 Marks	L3	CO5	PO1 PO3
		(OR)				
10.		Elucidate in detail about Revocation of Access Rights and Domain structure.	12 Marks	L1	CO5	PO1

CODE No.: 20MC1BS01 SVEC-20

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. I Semester (SVEC-20) Regular Examinations August – 2021

COMPUTER ORIENTED STATISTICAL TECHNIQUES

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Calculate Mean and Median from the following data: 6 Marks L4 CO1 PO2

Class Interval	20-30	30-40	40-50	50-60	60-70
Frequency	3	5	20	10	5

b) Find the Geometric Mean from the following data: 6 Marks L3 CO1 PO2

Class Interval	4-8	8-12	12-16	16-20	20-24
Frequency	2	4	8	5	3

(OR)

2. a) Find the Karl Pearson's co-efficient of skewness to the following data: 6 Marks L3 CO1 PO2

Class Interval	**0-2**	**2-4**	**4-6**	**6-8**	**8-10**	**10-12**	**12-14**
Frequency	**6**	**8**	**17**	**21**	**15**	**11**	**2**

b) Derive Central Moments in terms of Non-central Moments. 6 Marks L2 CO1 PO1

UNIT-II

3. Illustrate the operations of lists in R with example for each. 12 Marks L3 CO3 PO1

(OR)

4. Discuss in detail about matrices in R. 12 Marks L1 CO3 PO1

UNIT-III

5. a) Show that Binomial distribution tends to Poisson distribution as a limiting case. 6 Marks L3 CO2 PO2

b) Fit a Poisson distribution to the following data: 6 Marks L4 CO3 PO4

x	0	1	2	3	4
f	109	65	22	3	1

Also test the adequacy of model using R.

(OR)

6. a) One fifth percent of the blades produced by a blade manufacturing factory turnout to be defective. The blades are supplied in packets of 10. Use Poisson distribution to calculate the approximate number of packets containing; 6 Marks L3 CO2 PO2
   i) No defective blade.
   ii) One defective blade in a consignment of 10000.

b) The weekly wages of 1000 workers are normally distributed around a mean of Rs.70 and Standard Deviation of Rs.5. Estimate the number of workers whose weekly wages will be: 6 Marks L4 CO3 PO4
   i) between Rs. 70 and Rs.72.
   ii) between Rs. 69 and Rs.72 using R.

UNIT-IV

7. Find the rank correlation for the following data using R and comment on the result. — 12 Marks — L4 — CO3 — PO2

X	65	63	67	64	68	62	70	66	68	67	69	71
Y	68	66	68	65	69	66	68	65	71	67	68	70

(OR)

8. Compute the coefficient of correlation and the two lines of regression for the following data. — 12 Marks — L4 — CO4 — PO3

Price X:	14	16	17	18	19	20	21	22	23
Demand Y:	84	78	70	75	66	67	62	58	60

UNIT-V

9. a) A random sample of size 25 from a normal population has the mean $\overline{X}$ = 47.5 and the standard deviation S = 8.4. Does this information tend to support or refute the claim that the mean of the population is $\mu = 42.5$? — 6 Marks — L3 — CO2 — PO2

   b) A study shows that 16 out of 200 tractors produced one assembly line required extensive adjustments before they could be shopped, while the same was true for 14 of 400 tractors produced on another assembly line. At the 0.01 level of significance, does this support the claim that the second production line does superior work? — 6 Marks — L3 — CO2 — PO4

(OR)

10. a) Pumpkins were grown under two experimental conditions. Two random samples of 11 and 9 pumpkins. Show the sample standard deviations of their weights as 0.8 and 0.5 respectively. Assuming that the weight distributions are normal, test hypothesis that the true variances are equal. — 6 Marks — L3 — CO2 — PO2

    b) From the following data, find whether there is any significant liking in the habit of taking soft drinks among the categories of employees. — 6 Marks — L3 — CO2 — PO4

Soft Drinks	Clerks	Teachers	Officers
Pepsi	10	25	65
Thumsup	15	30	65
Fanta	50	60	30

CODE No.: 20MC10101 SVEC-20

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. I Semester (SVEC-20) Regular Examinations August – 2021

COMPUTER NETWORKS

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the role and importance of electromagnetic spectrum in data communication. Draw the electromagnetic spectrum.	6 Marks	L2	CO1	PO1
	b)	What is a primitive? List the service primitives for implementing a connection-oriented service.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Why parity checks and check sum are used? Explain parity checks and check summing methods with an example..	6 Marks	L2	CO1	PO1
	b)	Compare Optical Fibers and Copper Cable Guided Transmission Media.	6 Marks	L4	CO1	PO2
		UNIT-II				
3.	a)	Differentiate classical ALOHA and slotted ALOHA.	6 Marks	L4	CO3	PO2
	b)	Illustrate the Sliding window protocol using *Go-Back N* and *Selective Repeat* techniques.	6 Marks	L3	CO2	PO2
		(OR)				
4.	a)	Suppose we want to transmit the "message 1011 0010 0111 and protect it from errors using the cyclic redundancy check (CRC) polynomial $x^4 + x^2 + 1$. Use polynomial long division to determine the message that should be transmitted. Suppose the leftmost bit of the message is inverted due to noise on the transmission link. What is the result of the 'receiver's CRC calculation? How does the receiver know that an error has occurred?	6 Marks	L4	CO2	PO3
	b)	What is channel allocation problem? Explain types of channel allocation.	6 Marks	L1	CO2	PO1
		UNIT-III				
5.	a)	Apply least-cost-path routing algorithm to find a shortest path between source and destination with an example.	6 Marks	L3	CO3	PO3
	b)	Sketch the IPV4 packet format and explain the importance of IP protocol in the internet.	6 Marks	L2	CO3	PO2
		(OR)				
6.	a)	Sketch the IPV4 packet format and explain the importance of IP protocol in the internet.	7 Marks	L4	CO3	PO3
	b)	What are the techniques to be followed to achieve good quality of service?	5 Marks	L2	CO3	PO1
		UNIT-IV				
7.		Differentiate the TCP header and the UDP header formats. Identify the fields in the TCP header that are not part of the UDP header. Give the reasons for each missing field.	12 Marks	L2	CO3	PO2
		(OR)				

8.	a)	Although TCP provides a reliable service and UDP does not, many applications fit better in the communication system by using UDP. Investigate the reasons behind UDP supporting for many applications.	6 Marks	L3	CO4	PO4
	b)	Define the term Silly Window Syndrome. Examine the factors that cause silly window syndrome problem and how it can be avoided.	6 Marks	L2	CO4	PO4

UNIT-V

9.		Analyze the addressing system used by SMTP. Explain the Simple Mail Transfer Protocol (SMTP) protocol.	12 Marks	L2	CO4	PO2

(OR)

10.	a)	Discuss the need for name resolution. Illustrate the domain name hierarchy and the steps in resolution.	6 Marks	L2	CO4	PO3
	b)	Define MIME. Tabulate the MIME header and explain the content types.	6 Marks	L2	CO4	PO2

CODE No.: 20MC10102 SVEC-20

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. I Semester (SVEC-20) Regular Examinations August – 2021

DATABASE MANAGEMENT SYSTEMS

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Outline the architecture of Database Management System and explain its components.	8 Marks	L2	CO2	PO2
	b)	List and identify the advantages of using database systems.	4 Marks	L1	CO1	PO1
		(OR)				
2.		Explain the classification of Database Management System.	12 Marks	L2	CO2	PO2
		UNIT-II				
3.	a)	Mention different attribute data types used in Structured Query Language (SQL).	4 Marks	L1	CO3	PO3
	b)	Create a table in SQL by specifying attribute constraints and attribute defaults.	8 Marks	L3	CO3	PO3
		(OR)				
4.		Translate any Entity Relationship diagram into a collection of tables with associated constraints to a relational database schema.	12 Marks	L2	CO3	PO3
		UNIT-III				
5.		With relevant example, analyze various types of normal forms used in relational database.	12 Marks	L3	CO2	PO2
		(OR)				
6.		Write SQL query language for the following commands: i) Insert command. ii) Delete command. iii) Update command.	12 Marks	L3	CO4	PO4
		UNIT-IV				
7.		Describe the following concepts: i) Serializability. ii) Two-phase locking protocol.	12 Marks	L3	CO5	PO5
		(OR)				
8.	a)	What is a precedence graph or serializability graph? How is it related to conflict serializability?	6 Marks	L3	CO5	PO5
	b)	Discuss the relative merits of lock upgrades and lock downgrades.	6 Marks	L3	CO5	PO5
		UNIT-V				
9.		List out the characteristics of a B+ tree and explain a dynamic index structure B+ tree.	12 Marks	L3	CO2	PO2
		(OR)				
10.		Describe the Indexed Sequential Access Method (ISAM) index structure with a neat sketch and explain with a suitable example.	12 Marks	L3	CO2	PO2

CODE No.: 20MC10103 SVEC-20

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. I Semester (SVEC-20) Regular Examinations August – 2021

DATA STRUCTURES AND ALGORITHMS

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain best case, average case and worst case in analysis of algorithms.	6 Marks	L2	CO1	PO1
	b)	Differentiate the following: i) Big-Oh and Omega notation. ii) Linear and non-linear data structures.	6 Marks	L4	CO1	PO2
		(OR)				
2.		What do you mean by Searching? Explain Sequential search and Binary search with help of example.	12 Marks	L2	CO2	PO1
		UNIT-II				
3.		Explain the operations of doubly linked lists with example.	12 Marks	L2	CO3	PO1
		(OR)				
4.		What is a circular linked list? Design an algorithm to perform the following operations on Circular linked list: i) insert an element. ii) delete an element from a circular linked list.	12 Marks	L2	CO3	PO3
		UNIT-III				
5.		Explain linked list implementation of stacks with example.	12 Marks	L2	CO4	PO1
		(OR)				
6.		How stack operations are implemented using an array with suitable example?	12 Marks	L3	CO4	PO2
		UNIT-IV				
7.		Define the following terms with example with respect to Binary tree: i) Strictly Binary Tree. ii) Completely Binary Tree. iii) Binary Search Tree.	12 Marks	L2	CO5	PO1
		(OR)				
8.		Write the steps to construct a binary tree for the given Inorder and Postorder traversals: Inorder : 9,3,15,20,7 Postorder : 9,15,7,20,3	12 Marks	L6	CO5	PO5
		UNIT-V				
9.	a)	What is Hashing? Explain different Hash functions used in the construction of Hash tables.	6 Marks	L3	CO6	PO5
	b)	Explain in detail M-way search trees.	6 Marks	L2	CO5	PO1
		(OR)				
10.		Discuss following with reference to graphs with an example: i) Directed graph. ii) Undirected graph. iii) Degree of vertex. iv) Acyclic Graph.	12 Marks	L2	CO5	PO1

CODE No.: 20MC10104 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. I Semester (SVEC-20) Regular Examinations August – 2021

PYTHON PROGRAMMING

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		Describe the features, characteristics and applications of Python.	12 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Write short note on computational problem solving.	6 Marks	L2	CO1	PO1
	b)	Analyze the relationship between computers and algorithms.	6 Marks	L4	CO1	PO1
		UNIT-II				
3.	a)	How to perform iterations over list? Explain with an example.	6 Marks	L3	CO1	PO1
	b)	Explain solution control statement in python with example.	6 Marks	L2	CO1	PO1
		(OR)				
4.		Explain dictionary data type in python. Write a program to display the average temperature of any day of a week.	12 Marks	L3	CO3	PO3
		UNIT-III				
5.	a)	List and explain string methods in python with example.	6 Marks	L1	CO3	PO1
	b)	Explain the use of join and split method with examples. Describe why strings are immutable.	6 Marks	L2	CO3	PO3
		(OR)				
6.	a)	Describe function in python. Explain value returning and non value returning functions with examples.	6 Marks	L2	CO4	PO1
	b)	Differentiate between mutable *vs* immutable arguments with sample code.	6 Marks	L4	CO2	PO2
		UNIT-IV				
7.	a)	Explain the fundamental features of Object Oriented Programming.	6 Marks	L2	CO3	PO1
	b)	What is polymorphism? Illustrate manipulation of geometric shapes in python using polymorphism.	6 Marks	L3	CO3	PO3
		(OR)				
8.		Demonstrate the use of inheritance and polymorphism in python with an example program.	12 Marks	L3	CO4	PO1
		UNIT-V				
9.	a)	Discuss in brief about configuration of widgets.	6 Marks	L2	CO1	PO1
	b)	Write a short note on making widgets.	6 Marks	L2	CO5	PO3
		(OR)				
10.	a)	Choose the concepts of tkinter to implement Graphical user Interfaces using a python program.	6 Marks	L3	CO5	PO3
	b)	Describe the structure of tkinter.	6 Marks	L1	CO5	PO3

CODE No.:16MC30103 SVEC16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

M.C.A. III Semester (SVEC16) Supplementary Examinations August – 2021

OBJECT ORIENTED ANALYSIS AND DESIGN

[MASTER OF COMPUTER APPLICATIONS]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1.	a)	What are the application areas of UML? Give any five.	CO4	5 Marks
	b)	Explain the scenario of modeling mechanisms of different levels of abstraction.	CO2	7 Marks
		(OR)		
2.		Draw software architecture with explanation. Represent 4+1 view model of systems architecture.	CO3	12 Marks
		UNIT-II		
3.	a)	Enumerate the steps to model webs of relationships.	CO2	8 Marks
	b)	Contrast simple aggregation with composite aggregation. What is association class?	CO4	4 Marks
		(OR)		
4.	a)	List and explain the uses of class diagram.	CO2	6 Marks
	b)	Adapt the steps to reverse engineer a class diagram.	CO2	6 Marks
		UNIT-III		
5.		Design use case diagram that depict the context of a credit card validation system. Explain briefly.	CO5	12 Marks
		(OR)		
6.		Explain the following with regard to interaction diagrams. i) Object life line. ii) <<create>> and <<destroy>> messages. iii) Focus of control. iv) Dewey decimal numbering. v) Nesting of tours of control. vi) Semantic equivalence.	CO1	12 Marks
		UNIT-IV		
7.	a)	Differentiate between a Process and a Thread.	CO2	3 Marks
	b)	Identify standard stereotypes that can be applied to active class.	CO1	3 Marks
	c)	Model the behavior of an ATM machine with the help of a state chart diagram.	CO4	6 Marks
		(OR)		
8.		Infer the states that are associated with Borrowing a book from a library system. Draw the state chart diagram that explains various states of a book during the processing.	CO5	12 Marks
		UNIT-V		
9.		Demonstrate various objects participating in the library information system. Explain the object diagram that is associated with various interactions with a neat diagram.	CO5	12 Marks
		(OR)		
10.		Adapt common modeling techniques to implement deployment.	CO3	12 Marks

CODE No.: 19MC40101 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. IV Semester (SVEC-19) Regular Examinations August – 2021

OBJECT ORIENTED ANALYSIS AND DESIGN

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Define a Model. What is the importance of modeling?	6 Marks	L1	CO1	PO1
	b)	Explain the role of object-oriented modeling in design.	6 Marks	L1	CO1	PO2
		(OR)				
2.		Enumerate the steps for the following: i) Modeling different views of a system. ii) Modeling different levels of abstraction.	12 Marks	L2	CO1	PO3
		UNIT-II				
3.	a)	List the steps to model simple collaborations.	6 Marks	L2	CO1	PO3
	b)	What do you mean by the term Classifier? Identify all the types of classifiers that UML provides in modeling.	6 Marks	L3	CO2	PO2
		(OR)				
4.	a)	What is an Association class? Compare simple aggregation with composite aggregation.	4 Marks	L2	CO2	PO4
	b)	Design a class diagram rendering an ATM system using the following: i) Notes. ii) Stereotypes. iii) Other Adornments. iv) Tagged Values.	8 Marks	L4	CO4	PO5
		UNIT-III				
5.	a)	Draw a Use case diagram for the scenario of cellular network that place a phone call correctly and also schedule the receiving and conference calls.	6 Marks	L4	CO3	PO4
	b)	Explain the steps to model the context of a system.	6 Marks	L2	CO2	PO3
		(OR)				
6.		Explain the following with respect to interaction diagrams: i) Object lifeline ii) <<create>> and <<destroy>> messages. iii) Focus of control. iv) Dewey decimal numbering. v) Nesting of tours of control. vi) Semantic equivalence.	12 Marks	L2	CO3	PO2
		UNIT-IV				
7.		Infer the states that are associated with "*borrowing a book"* from a Library Management System. Draw the state chart diagram and explain various states of a book during the transaction.	12 Marks	L2	CO3	PO5
		(OR)				
8.		Compare the following: i) Event and Signal. ii) Sequential substates and Concurrent substates.	12 Marks	L4	CO3	PO4
		UNIT-V				
9.	a)	Explain the deployment diagram for modeling an embedded system.	6 Marks	L2	CO3	PO3
	b)	Design a model to represent "*issuing a book*" operation using UML collaboration diagram with appropriate notations.	6 Marks	L2	CO3	PO3
		(OR)				
10.	a)	Enumerate the steps in Modeling Adaptable Systems.	6 Marks	L2	CO3	PO3
	b)	Illustrate the process of forward and reverse engineering the artifact diagrams.	6 Marks	L3	CO3	PO3

CODE No.: 19MC40102 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. IV Semester (SVEC-19) Regular Examinations August – 2021

LINUX PROGRAMMING

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Mention the significance of the following commands. i) ls – ld. ii) ls – l.	6 Marks	L2	CO1	PO1
	b)	How the *'sed'* can be implemented to filter the patterns for a text file?	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	List and explain disk and backup utilities available in Linux.	8 Marks	L2	CO1	PO1
	b)	How to use system commands in awk?	4 Marks	L4	CO1	PO2
		UNIT-II				
3.	a)	Perform Arithmetic operations in a shell script (small calculator) that adds, subtracts, multiplies and divides the given two integers. There are two division options: one returns the quotient and the other returns reminder. The script requires 3 arguments: The operation to be used and two integer numbers. The options are add (-a), subtract (-s), multiply (-m), quotient (-c) and reminder (-r).	6 Marks	L4	CO3	PO2
	b)	What are shell meta characters? How shell meta characters can behave in shell?	6 Marks	L3	CO3	PO2
		(OR)				
4.	a)	Discuss the control structures in shell script with examples.	6 Marks	L4	CO3	PO1 PO3
	b)	Provide the syntax for *'case'* in shell. Develop a shell script to implement simple calculator.	6 Marks	L3	CO3	PO3
		UNIT-III				
5.	a)	Describe file APIs. Implement a C program on file APIs.	6 Marks	L3	CO4	PO3
	b)	Implement any three Text processing utilities in Linux with suitable examples.	6 Marks	L2	CO4	PO2
		(OR)				
6.	a)	What is the difference between home directory and working directory and explain with an example?	6 Marks	L4	CO4	PO3
	b)	Elaborate the File attributes in Linux.	6 Marks	L1	CO4	PO1
		UNIT-IV				
7.	a)	Generate C program to create a child process and allow the parent to display "Hello" and the child to display "Welcome" on the screen.	6 Marks	L3	CO4	PO3
	b)	Illustrate is detail about ***sigsetjump()*** and ***siglongjump()*** API's.	6 Marks	L2	CO4	PO3
		(OR)				
8.	a)	Codify the syntax and explain each of the given functions with a suitable example. i) fork( ). ii) exec( ).	6 Marks	L3	CO4	PO4
	b)	Provide the syntax for the following with suitable example. i) kill. ii) alarm interval timers.	6 Marks	L3	CO4	PO4

UNIT-V

9.		How socket system calls can be adopted for connectionless protocol?	12 Marks	L4	CO2	PO2

(OR)

10.	a)	Apply the stream socket in a Client/Server program.	6 Marks	L3	CO2	PO3
	b)	Write syntax with a suitable example for the following socket API's. i) socket(). ii) bind(). iii) listen(). iv) connect(). v) accept().	6 Marks	L3	CO5	PO2

CODE No.: 19MC40103 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. IV Semester (SVEC-19) Regular Examinations August – 2021

WEB PROGRAMMING

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		Discuss structure of HTML program with suitable example.	12 Marks	L2	CO2	PO2
		(OR)				
2.	a)	Explain the Image and Paragraph tags of HTML with suitable examples.	6 Marks	L1	CO1	PO1
	b)	Describe the event handling mechanism in AJAX.	6 Marks	L3	CO3	PO3
		UNIT-II				
3.		Justify a "*Valid*" XML document is "*Well Formed*", as well as it conforms to the rules of a Document Type Definition (DTD).	12 Marks	L5	CO5	PO5
		(OR)				
4.	a)	Write difference between Document Object Model (DOM) and Simple API for XML (SAX).	6 Marks	L2	CO2	PO2
	b)	What is eXtensible Stylesheet Language Transformations (XSLT)? Explain with example.	6 Marks	L1	CO1	PO1
		UNIT-III				
5.		Define Servlet. Discuss Life cycle methods of Servlet.	12 Marks	L1	CO1	PO1
		(OR)				
6.		Define JDBC. Discuss JDBC drivers with suitable diagram.	12 Marks	L1	CO1	PO1
		UNIT-IV				
7.		Write a JSP program that using any one of implicit object.	12 Marks	L4	CO4	PO4
		(OR)				
8.		Sketch the life cycle of JSP with necessary steps and suitable example.	12 Marks	L3	CO3	PO3
		UNIT-V				
9.	a)	Develop a PHP that uses user defined function to print multiplication table of given number.	6 Marks	L3	CO3	PO3
	b)	Elucidate arrays in PHP.	6 Marks	L1	CO1	PO1
		(OR)				
10.		Implement files in PHP to read and write the contents of the file.	12 Marks	L5	CO6	PO5

CODE No.: 19MC40104 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. IV Semester (SVEC-19) Regular Examinations August – 2021

BLOCKCHAIN TECHNOLOGIES

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		Design the network view of a blockchain and explain the components in it.	12 Marks	L3	CO1	PO1 PO3
		(OR)				
2.		What are the elements needed to achieve full ecosystem decentralization?	12 Marks	L2	CO1	PO1 PO2
		UNIT-II				
3.		Define a transaction in blockchain. Discuss the life cycle of a transaction.	12 Marks	L1	CO2	PO2 PO3
		(OR)				
4.		Classify the theoretical foundations which had give scope for altcoins.	12 Marks	L2	CO2	PO2 PO5
		UNIT-III				
5.	a)	Discuss the importance of the smart contracts and build the templates of smart contracts.	6 Marks	L2	CO2	PO3 PO5
	b)	Describe the importance of Oracles in smart contract ecosystem.	6 Marks	L2	CO5	PO5
		(OR)				
6.		Demonstrate the working environment of Block Apps platform.	12 Marks	L3	CO4	PO3 PO4 PO5
		UNIT-IV				
7.		Illustrate the importance of Ethereum blockchain.	12 Marks	L2	CO2	PO1 PO2
		(OR)				
8.	a)	Express the key functions of miner in Ethereum blockchain.	6 Marks	L2	CO2	PO2 PO5
	b)	Identify the components of Messages in Ethereum environment.	6 Marks	L2	CO5	PO5 PO6
		UNIT-V				
9.		Write a short notes on the following: i) Block Size Increase. ii) Block Interval Reduction. iii) State Channels.	12 Marks	L2	CO3	PO2 PO3
		(OR)				
10.		Recognize how the blockchain has changed the business environment.	12 Marks	L2	CO3	PO2

CODE No.: 19MC40108 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. IV Semester (SVEC-19) Regular Examinations, August – 2021

INFORMATION RETRIEVAL SYSTEMS

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	How information retrieval system is related to database management system?	6 Marks	L4	CO3	PO2 PO5
	b)	Discuss about digital libraries and data warehouses.	6 Marks	L2	CO1	PO2 PO3
		(OR)				
2.		What are miscellaneous capabilities in Information Retrieval Systems? Describe vocabulary browse and canned query.	12 Marks	L2	CO1	PO2 PO5
		UNIT-II				
3.		Illustrate the objectives of cataloging and indexing.	12 Marks	L4	CO1	PO2 PO5
		(OR)				
4.		Discuss about N-grams and Practical Algorithm To retrieve Information (PAT) data structures with example.	12 Marks	L2	CO1	PO2 PO5
		UNIT-III				
5.	a)	Differentiate statistical indexing and concept indexing.	6 Marks	L4	CO3	PO2
	b)	Explain hypertext linkages with suitable example.	6 Marks	L2	CO3	PO1
		(OR)				
6.		How manual clustering and automatic term clustering can be performed with suitable example?	12 Marks	L3	CO2	PO2 PO3
		UNIT-IV				
7.		List out user search techniques. Explain any two search techniques with suitable example.	12 Marks	L3	CO3	PO5
		(OR)				
8.		Discuss various information visualization technologies.	12 Marks	L2	CO2	PO1 PO2
		UNIT-V				
9.		Identify the importance of hardware usage in Text search system. Explain in detail Hardware text search system.	12 Marks	L2	CO2	PO1 PO5
		(OR)				
10.		Implement Knuth-Pratt-Morris algorithm with suitable example.	12 Marks	L3	CO2	PO3 PO5

CODE No.: 16MC50106 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

MCA V Semester (SVEC-16) Supplementary Examinations August - 2021

INFORMATION SECURITY
[Master of Computer Applications]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Analyze the problems associated with the One-Time pad.	CO2	4 Marks
	b)	What is a Transposition Cipher? Demonstrate Rail Fence cipher technique with an example.	CO3	8 Marks
		(OR)		
2	a)	What are the essential ingredients and the two basic functions used in encryption algorithms of a symmetric cipher?	CO2	6 Marks
	b)	On what dimensions do the cryptographic systems are characterized? Explain different types of cryptanalysis attacks.	CO2	6 Marks
		UNIT-II		
3	a)	Draw the Stream cipher structure and list the important design considerations for a stream cipher.	CO2	6 Marks
	b)	Explain the RC4 stream cipher technique used for encryption and decryption.	CO1	6 Marks
		(OR)		
4	a)	Write Diffie-Hellman Key exchange algorithm and explain with an example.	CO5	8 Marks
	b)	Analyze the possible approaches in attacking the RSA algorithm.	CO3	4 Marks
		UNIT-III		
5	a)	Discuss various authentication procedures supported in X.509.	CO1	7 Marks
	b)	Identify the Hash Function requirements.	CO2	5 Marks
		(OR)		
6		Overview Kerberos and analyze the Kerberos version 4 simple authentication dialogue and more secure authentication dialogue.	CO2	12 Marks
		UNIT-IV		
7		Illustrate the operational description and implementation of PGP.	CO4	12 Marks
		(OR)		
8	a)	Discuss about the S/MIME content types.	CO1	6 Marks
	b)	Why is the segmentation and reassembly function in PGP needed?	CO3	6 Marks
		UNIT-V		
9	a)	Brief about the Password Management.	CO1	6 Marks
	b)	What are typical phases of operation of a virus or worm?	CO2	6 Marks
		(OR)		
10		What is a Firewall? Classify the types of firewalls and list the capabilities and limitations of firewall.	CO2	12 Marks

❀ ❀ ❀

CODE No.: 19MC50101 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. V Semester (SVEC-19) Regular Examinations January – 2022

CLOUD COMPUTING

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

	UNIT-I				
1.	Explain various Cloud Computing roles and boundaries.	12 Marks	L1	CO1	PO1 PO2
	(OR)				
2.	Differentiate the following: i) Horizontal Scaling and Vertical Scaling. ii) Private and Public Clouds.	12 Marks	L2	CO1	PO1 PO2
	UNIT-II				
3.	Describe the following: i) Web Services. ii) Rest Services.	12 Marks	L1	CO3	PO2 PO5
	(OR)				
4.	Demonstrate the working model of Redundant Storage Architecture in Cloud Computing.	12 Marks	L3	CO4	PO2 PO3
	UNIT-III				
5.	How can the provisioning of IT resources be automated and made available to cloud consumer's on-demand?	12 Marks	L3	CO4	PO2 PO4
	(OR)				
6.	How can a virtual server maintain its network connection when it is migrated to a new physical host?	12 Marks	L3	CO2	PO3 PO4
	UNIT-IV				
7.	Discuss the fundamental concepts of cloud security.	12 Marks	L2	CO5	PO1 PO2
	(OR)				
8.	Write a short notes on the following: i) Identity and Access Management. ii) Cloud-Based Security Groups.	12 Marks	L1	CO5	PO1 PO2
	UNIT-V				
9.	Distinguish between Infrastructure as a Service and Platform as a Service with suitable example.	12 Marks	L2	CO3	PO1 PO2
	(OR)				
10.	Define Software as a Service (SaaS). List characteristics of SaaS for salesforce.com	12 Marks	L1	CO3	PO1 PO2

CODE No.: 19MC50102 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. V Semester (SVEC-19) Regular Examinations January – 2022

DATA ANALYTICS

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain Big Data Characteristics with examples.	6 Marks	L1	CO1	PO1
	b)	Compare Business Intelligence with Data Science.	6 Marks	L2	CO1	PO2
		(OR)				
2.		Sketch Data Analytics Architecture with explanation.	12 Marks	L2	CO1	PO3
		UNIT-II				
3.		How to Analyze the data using Hadoop and Unix Tools?	12 Marks	L2	CO2	PO2 PO5
		(OR)				
4.		Discuss in detail about: :i) Scaling out. ii) Combiner function.	12 Marks	L1	CO1	PO1
		UNIT-III				
5.		Illustrate the steps to configure the development environment in Hadoop.	12 Marks	L2	CO3	PO5
		(OR)				
6.		Develop unit test code to test map and reduce functions.	12 Marks	L3	CO4	PO3
		UNIT-IV				
7.		Elaborate on the Hive QL Indexes.	12 Marks	L2	CO2	PO1
		(OR)				
8.		List and explain DML operations using HIVE QL Views.	12 Marks	L3	CO2	PO4
		UNIT-V				
9.	a)	Demonstrate vector operations with examples.	6 Marks	L3	CO5	PO3
	b)	Explain the use of ***all*** and ***any*** with example.	6 Marks	L4	CO5	PO5
		(OR)				
10.		Write a R program to implement matrix operations.	12 Marks	L3	CO5	PO3

CODE No.: 19MC50103 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. V Semester (SVEC-19) Regular Examinations January – 2022

MOBILE APPLICATION DEVELOPMENT

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	What is Microwave technology? Explain.	6 Marks	L1	CO1	PO1 PO2
	b)	Write about Radio Data Networks.	6 Marks	L1	CO1	PO1 PO2
		(OR)				
2.	a)	Draw the neat diagram for J2ME architecture.	6 Marks	L1	CO1	PO1 PO2
	b)	Distinguish the J2ME features from standard Java.	6 Marks	L1	CO1	PO1 PO2
		UNIT-II				
3.		Illuminate Screen class and Alert class with examples.	12 Marks	L2	CO5	PO2 PO4
		(OR)				
4.		Define Display class and Command class. Explain with examples.	12 Marks	L2	CO5	PO2 PO4
		UNIT-III				
5.		Write about the following with respect to record management system of J2ME. Storing, Writing, Reading and Sorting of records.	12 Marks	L2	CO3	PO3 PO5
		(OR)				
6.		With suitable example, describe Canvas class.	12 Marks	L1	CO2	PO2 PO3
		UNIT-IV				
7.		Discuss Database schema with suitable examples.	12 Marks	L2	CO3	PO3 PO5
		(OR)				
8.	a)	List the Data types used in JDBC.	6 Marks	L2	CO4	PO3 PO4
	b)	Write about Exceptions.	6 Marks	L2	CO4	PO3 PO4
		UNIT-V				
9.		Write about the following with respect to tables in J2ME. Inserting data, Selecting data and Updating data.	12 Marks	L2	CO5	PO2 PO3
		(OR)				
10.		What is Connection? Explain Connections and Streams.	12 Marks	L4	CO4	PO2 PO3

CODE No.: 19MC50105 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. V Semester (SVEC-19) Regular Examinations January – 2022

.NET TECHNOLOGIES

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

	UNIT-I				
1.	Sketch .Net framework architecture with neat diagram and also discuss IL, CLR, CTS and CLS.	12 Marks	L2	CO2	PO1 PO2
	(OR)				
2.	Write a console application to Perform Celsius to Fahrenheit Conversion and Fahrenheit to Celsius conversion.	12 Marks	L4	CO5	PO2 PO4
	UNIT-II				
3.	Define Inheritance and explain it in brief with suitable example.	12 Marks	L3	CO2	PO2 PO3
	(OR)				
4.	Implement a C# program to generate divide by zero exception and also handle this exception.	12 Marks	L4	CO5	PO2 PO4
	UNIT-III				
5.	Can you explain Constructor and Function Overloading with example?	12 Marks	L3	CO1 CO5	PO1 PO2
	(OR)				
6.	Explain Explicit Interface Implementation with suitable example.	12 Marks	L2	CO1 CO5	PO2 PO5
	UNIT-IV				
7.	Draw and explain ADO.NET architecture in detail.	12 Marks	L2	CO2	PO2 PO3
	(OR)				
8.	Explain usage of following ADO.NET objects with their methods. i) SqlDataAdapter. ii) SqlCommand object. iii) Dataset.	12 Marks	L1	CO2	PO1 PO2 PO3
	UNIT-V				
9.	Explain the concept of master pages in ASP.NET with example.	12 Marks	L3	CO4	PO2 PO4
	(OR)				
10.	Explain various Validation controls for ASP.NET with example.	12 Marks	L3	CO4	PO2 PO4

❀ ❀ ❀

CODE No.: 19MC50110 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. V Semester (SVEC-19) Regular Examinations January – 2022

INTERNET OF THINGS

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Identify various architectural constraints of REST-based communication APIs.	6 Marks	L2	CO1	PO1
	b)	How do data collection and analysis approaches differ in M2M and IoT?	6 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Examine, how Software Defined Networking (SDN) can be used for various levels of IoT.	6 Marks	L3	CO1	PO3
	b)	Describe the functional blocks of an IoT system.	6 Marks	L1	CO1	PO2
		UNIT-II				
3.	a)	Develop a python pseudo code for switching LED on/off from Raspberry Pi console and also for blinking LED.	6 Marks	L2	CO4	PO5
	b)	Explain the Seven Layered architecture of IoT with a neat sketch.	6 Marks	L2	CO1	PO2
		(OR)				
4.	a)	What choice would you have made to improve the health and fitness monitoring? Discuss about the wearable electronics.	6 Marks	L3	CO2	PO2
	b)	Design the process of interfacing a Light Sensor (LDR) with Raspberry Pi with suitable pseudocode.	6 Marks	L2	CO4	PO5
		UNIT-III				
5.	a)	How would you address the limitations of the existing network management protocols and discuss the overview of the operator requirements?	7 Marks	L4	CO2	PO4
	b)	Draw and analyze the layered architecture of NETCONF protocol.	5 Marks	L3	CO1	PO2
		(OR)				
6.	a)	How sensor data is stored and interpreted that could be used for processing?	4 Marks	L2	CO2	PO3
	b)	Can you elaborate the overview of Internet Communications?	8 Marks	L1	CO2	PO2
		UNIT-IV				
7.		Describe the following for weather monitoring IoT system: i) Domain model. ii) Information model. iii) Deployment design	12 Marks	L2	CO3	PO2
		(OR)				
8.	a)	Distinguish between REST-based and WebSocket-based implementation of weather monitoring system.	6 Marks	L2	CO5	PO2
	b)	How would you implement WAMP publisher and subscriber using AutoBahn framework?	6 Marks	L2	CO4	PO2

UNIT-V

9.	a)	Examine the security challenges associated with Medical IoT devices.	6 Marks	L2	CO4	PO4 PO10
	b)	Write short notes on the following: i) Remote vehicle access. ii) Targeting cameras in IoT ecosystem.	6 Marks	L1	CO4	PO1
		(OR)				
10.	a)	Discuss the MapReduce job execution workflow with a neat sketch.	5 Marks	L2	CO3	PO2
	b)	How analytics can be performed on the data? Draw and explain the deployment design of forest fire detection system and perform data analysis for forest fire detection.	7 Marks	L4	CO3	PO4

CODE No.: 19MT10501 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.Tech I Semester (SVEC-19) Regular/Supplementary Examinations, August - 2021

ADVANCED ALGORITHMS

[Computer Science]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What are the advantages of algorithms compared to flow charts? Discuss.	6 Marks	L2	CO1	PO1
	b)	In an algorithm that tests a given integer whether prime or not, discuss the complexity of algorithm, when iteration construct is used.	6 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Maximize total profit of only one job, which can be scheduled at any time: Input : Five Jobs with following deadlines and profits	6 Marks	L2	CO1	PO1

JobID	*Deadline*	*Profit*
a	2	100
b	1	19
c	2	27
d	1	25
e	3	15

	b)	Define 0/1 Knapsack problem. How the do the control abstract of divide and conquer will apply to the solution of 0/1 Knapsack Problem? Discuss.	6 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Discuss how the problem solving methodology "Dynamic Programming" be selected for solving a problem. State the requirement criteria.	6 Marks	L2	CO1 CO2	PO1
	b)	Discuss how the Traveling Salesperson problem be solved using Dynamic Programming.	6 Marks	L3	CO2	PO1
		(OR)				
4.	a)	Discuss how backtracking manifests as a 'dynamic programming problem solving methodology' in the case of ***n***-queen problem.	6 Marks	L2	CO1 CO2	PO2
	b)	Given a set of non-negative integers, and a value sum, determine if there is a subset of the given set with sum equal to given sum. set[] = {3, 34, 4, 12, 5, 2}, sum = 9.	6 Marks	L3	CO2	PO2

UNIT-III

5.	a)	State the difference between NP, NP complete and NP-hard problem.	6 Marks	L2	CO1 CO2	PO1
	b)	Define polynomial reducible. Write about undecidable problem.	6 Marks	L3	CO1 CO2	PO2

(OR)

6.	a)	Define set cover. How a set cover contributes to greedy method of programming methodology?	6 Marks	L2	CO1 CO2	PO1
	b)	'A set cover problem can overcome in approximation', discuss the problem is NP-complete.	6 Marks	L2	CO1	PO1

UNIT-IV

7.	a)	Define maximum flow in the directed capacitated network. Write about flow rules.	6 Marks	L2	CO1	PO1
	b)	Discuss how to obtain residual network in the application of Ford-Fulkerson algorithm.	6 Marks	L4	CO2	PO1

(OR)

8.	a)	"For any integer a and any positive integer n, there exist unique integers q and r such that $0 \leq r < n$ and $a = qn + r$". Discuss the properties of the said division theorem.	6 Marks	L2	CO1 CO2	PO1
	b)	Discuss the worst-case runtime of Euclid algorithm for determining **gcd** of three integers a, b, c.	6 Marks	L4	CO2	PO1

UNIT-V

9.	a)	What is dictionary? Discuss the role of dictionary in string-pattern matching.	6 Marks	L2	CO1	PO1
	b)	Write about the runs of the naïve pattern-matching algorithm for the following: Search string : ababbaabaaab Pattern string : abaa	6 Marks	L2	CO2	PO1

(OR)

10.	a)	Discuss how tries contribute in string-pattern matching algorithms.	6 Marks	L2	CO1	PO1
	b)	Write about randomized algorithms. How do they contribute to obtain the optimal solutions when compared with traditional problem solving methodologies?	6 Marks	L2	CO1	PO1

CODE No.: 19MT10502 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.Tech I Semester (SVEC-19) Regular/Supplementary Examinations, August - 2021

ADVANCED DATA STRUCTURES

[Computer Science]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Define stack and write functions to implement Push and Pop operations on stack using arrays with stack full and stack empty conditions.	6 Marks	L2	CO1	PO1
	b)	Write the functions to perform insertion and deletion in a circular queue and illustrate with a sample input and output.	6 Marks	L3	CO1	PO1
		(OR)				
2.	a)	Explain the algorithm to evaluate postfix expression using stack with an illustration.	6 Marks	L3	CO1	PO1
	b)	What is the advantage of doubly linked list over singly linked list? Illustrate with an example.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Discuss in detail about the use of maps in STL.	6 Marks	L2	CO2	PO1
	b)	List and explain the properties of B-tree.	6 Marks	L2	CO1	PO1
		(OR)				
4.	a)	Write a short note on different tree traversal techniques.	6 Marks	L2	CO1	PO1
	b)	Explain the bottom-up insertion procedure in the Red-Black trees with an example.	6 Marks	L2	CO1	PO1
		UNIT-III				
5.	a)	Discuss in detail about the probabilistic analysis of skip lists.	6 Marks	L2	CO2	PO1
	b)	With an example illustrate the Depth First Search traversal technique in graphs.	6 Marks	L2	CO1	PO2
		(OR)				
6.	a)	Write a short note on deterministic skip lists and its advantages.	6 Marks	L2	CO2	PO1
	b)	Give an outline on the representation of a graph and list its application.	6 Marks	L2	CO1	PO1
		UNIT-IV				
7.	a)	Prove that the amortized time of FIB-HEAP-EXTRACT-MIN and FIB-HEAP-DELETE is O(log n).	6 Marks	L4	CO1	PO2
	b)	Analyze in detail about the applications of Priority Queues.	6 Marks	L3	CO1	PO2
		(OR)				
8.	a)	Illustrate the separate chaining method of handling collision with an example.	6 Marks	L2	CO1	PO2
	b)	Write a short note on Hash function and Hash tables.	6 Marks	L2	CO1	PO1
		UNIT-V				
9.	a)	Analyze the performance of range-searching query in a quad tree.	6 Marks	L4	CO1	PO2
	b)	Write a short note on two different kinds of k-d trees, region-based k-d trees and point-based k-d trees.	6 Marks	L2	CO2	PO1
		(OR)				
10.	a)	Write an algorithm for two-dimensional range searching in range trees.	6 Marks	L3	CO1	PO1
	b)	With a neat sketch explain the two dimensional range searching in range trees.	6 Marks	L2	CO1	PO1

CODE No.: 19MT10503 SVEC-19

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.Tech I Semester (SVEC-19) Regular/Supplementary Examinations, August - 2021

MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

[Computer Science, Computer Networks and Information Security]

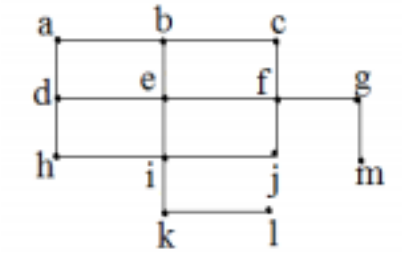
Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Construct a truth table to show that $(p \wedge q) \rightarrow p$ is a tautology.	6 Marks	L3	CO1	PO1
	b)	Show that $\forall x(P(x) \wedge Q(x)) \equiv \forall x P(x) \wedge \forall x Q(x)$.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Obtain principle disjunctive normal form of the following: $p \rightarrow \{(p \rightarrow q) \wedge \neg (\neg q \vee \neg q)\}$.	6 Marks	L2	CO1	PO1
	b)	Show that $R \rightarrow (S \rightarrow Q)$, $\sim P \vee R$ and $S \Rightarrow P \rightarrow Q$.	6 Marks	L3	CO1	PO1
		UNIT-II				
3.	a)	Let X = {1,2,3,4,5,6} and R be a relation defined as $(x, y) \in R$ if and only if $x - y$ is divisible by 3. Find elements of relation of R.	6 Marks	L3	CO1	PO1
	b)	Let B={a,b,c} and A=P(B) be the power set of B. Draw the Hasse diagram for $\subseteq$ and poset A.	6 Marks	L2	CO1	PO1
		(OR)				
4.	a)	If A, B and C are any three sets then prove that i) $A \cup (B - A) = A \cup B$. ii) $A - (B \cup C) = (A - B) \cap (A - C)$.	6 Marks	L3	CO1	PO1
	b)	Show that the function F from $<N, +>$ to $<N, *>$ defined by $f(x) = 2X$ for all x belong to N is a homomorphism.	6 Marks	L2	CO1	PO1
		UNIT-III				
5.	a)	There are 35 students and 4 teachers in a college. In how many ways every student shakes hand with other students and all the teachers.	6 Marks	L2	CO1	PO1
	b)	How many different five digit numbers can be formed from the digits 0,1,2,3 and 4?	6 Marks	L2	CO1	PO1
		(OR)				
6.	a)	Prove that the order of $\boldsymbol{a}^{-1}$ is same as the order of $\boldsymbol{a}$.	6 Marks	L3	CO2	PO1
	b)	In how many ways can you select at least one king, if you choose five cards from a Deck of 52 cards?	6 Marks	L2	CO2	PO1
		UNIT-IV				
7.	a)	Solve the Recurrence Relation. $a^2_{n+2} - 5a^2_{n+1} + 6a^2_n = 0$, $n \geq 0$, $a_0 = a_1 = 1$	6 Marks	L2	CO2	PO2
	b)	Solve the Recurrence Relation $U_n + 5U_{n-1} + 5U_{n-2} = 0$, $n \geq 0$, where the initial conditions are $U_0=0$ and $U_1=2\sqrt{5}$.	6 Marks	L2	CO2	PO2
		(OR)				
8.	a)	Solve $\sqrt{a_n} - \sqrt{a_{n-1}} - 2\sqrt{a_{n-2}} = 0$ where $a_0 = a_1 = 1$.	6 Marks	L2	CO2	PO1
	b)	Find the Sequence generated by the function $(3 + X)^3$.	6 Marks	L2	CO2	PO1

UNIT-V

9.	a)	Give an example graph which is Hamiltonian but not Eulerian.	6 Marks	L2	CO2	PO1
	b)	Using depth first search method, determine the spanning tree **T** for the following graph with the vertex ***e*** as the root of **T**.	6 Marks	L4	CO2	PO2



(OR)

10.	a)	Let G be the non directed graph of order 9 such that each vertex has degree 5 or 6. Prove that atleast 5 vertices have degree 6 or atleast 6 vertices have degree 5.	6 Marks	L2	CO2	PO2
	b)	Determine the number of edges in: i) K_n ii) $K_{m,n}$ iii) P_n.	6 Marks	L2	CO2	PO1

CODE No.: 19MT10708 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.Tech I Semester (SVEC-19) Regular/Supplementary Examinations, August 2021

RESEARCH METHODOLOGY AND IPR

[Computer Science, V L S I]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Discuss in detail various types of research designs. Which factors influence the choice of research design?	12 Marks	L3	CO1	PO1
		(OR)				
2.		Discuss the difference between probability and non- probability sampling techniques. Discuss in detail various types of probability sampling techniques.	12 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Enumerate different types of errors that may occur while formulating the hypothesis. Justify with an example.	6 Marks	L2	CO1	PO1
	b)	Most graduate schools of business require applicants for admission to take the Graduate Management Admission Council's GMAT examination. Scores on the GMAT are roughly normally distributed with a mean of 527 and a standard deviation of 112. What is the probability of an individual scoring above 500 on the GMAT?	6 Marks	L3	CO1	PO2
		(OR)				
4.	a)	Justify how *chi-square* test can be used for quantifying the Goodness of Fit and enlist the procedural steps involved in testing.	6 Marks	L4	CO1	PO3
	b)	The table given below shows the data obtained during an epidemic of cholera:	6 Marks	L3	CO1	PO2

	Attacked	**Not attacked**	**Total**
Inoculated	31	469	500
Not inoculated	185	1315	1500
Total	**216**	**1784**	**2000**

Test the effectiveness of Inoculation in preventing cholera using chi-square test.

UNIT-III

5.	a)	Is it necessary to practice ethics in research. If yes, justify your answer with the ethics that should be followed while leading a research.	6 Marks	L4	CO2	PO6
	b)	Explain the significance of a research report and narrate the various steps involved in writing such a report.	6 Marks	L2	CO2	PO5

(OR)

6.	a)	Write a brief note on the '*task of interpretation'* in the context of research methodology.	6 Marks	L3	CO2	PO5
	b)	Mention the different types of reports, particularly pointing out the difference between a technical report and a popular report.	6 Marks	L3	CO2	PO5
		UNIT-IV				
7.	a)	Explain the process involved in trademark selection and evaluation.	6 Marks	L2	CO3	PO1
	b)	Describe the process involved for trademark registration.	6 Marks	L2	CO3	PO1
		(OR)				
8.		Discuss the importance of intellectual property rights.	12 Marks	L2	CO3	PO6
		UNIT-V				
9.		What is copyright? Why should copyright be protected? What are the classes of works for which copyright protection is available in India?	12 Marks	L2	CO3	PO6
		(OR)				
10		Explain copy right registration processes.	12 Marks	L2	CO3	PO6

.

CODE No.: 19MT15701 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.Tech I Semester (SVEC-19) Regular/Supplementary Examinations, August - 2021

ANALOG CMOS VLSI DESIGN

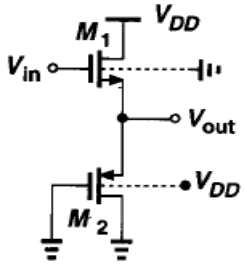
[V L S I]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Find the voltage gain of the circuit shown below.	5 Marks	L2	CO1	PO1



	b)	Explain about cascode stage amplifier with resistive load.	7 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Illustrate how a MOS transistor can act like current source.	5 Marks	L2	CO1	PO1
	b)	Develop the large signal model for CG Configuration with necessary equations.	7 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Compare allowable voltages in a cascode with resistive load.	6 Marks	L2	CO1	PO1
	b)	Demonstrate the shielding property of cascode stage amplifier.	6 Marks	L2	CO1	PO1
		(OR)				
4.	a)	Explain the effect of Noise in source follower.	5 Marks	L2	CO1	PO1
	b)	Develop a differential pair with current source as a load and show the frequency response.	7 Marks	L3	CO1	PO2

UNIT-III

5.	a)	Classify the different types of Feedback topology and explain any one of them.	7 Marks	L2	CO2	PO1
	b)	Illustrate Noise in Op Amps.	5 Marks	L2	CO2	PO1
		(OR)				
6.	a)	Develop the expression for power-supply rejection ratio of Two-stage op-amps.	7 Marks	L3	CO2	PO2
	b)	Define the following: i) Gain Boosting. ii) Input range limitations.	5 Marks	L1	CO2	PO1

UNIT-IV

7.	a)	Model a two stage op amp to explain the trade off involved in selecting the input stage as p-channel or n-channel.	7 Marks	L3	CO3	PO3
	b)	Demonstrate PTAT Current generation.	5 Marks	L2	CO3	PO1
		(OR)				
8.	a)	Define the following: i) Supply-Independent Biasing ii) Phase Margin.	6 Marks	L1	CO3	PO1
	b)	Classify the temperature independent references.	6 Marks	L2	CO3	PO1

UNIT-V

9.	a)	Explain Charge Injection Cancellation and precision consideration in Sampling Switches.	7 Marks	L2	CO4	PO1
	b)	Show the equivalent circuit of non inverting amplifier during precision consideration in switched capacitor.	5 Marks	L2	CO4	PO1
		(OR)				
10.	a)	Explain the basic PLL technology.	5 Marks	L2	CO4	PO1
	b)	Explain switched capacitor circuit and its principle.	7 Marks	L2	CO4	PO1

CODE No.: 19MT15702 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.Tech I Semester (SVEC-19) Regular/Supplementary Examinations, August - 2021

DEVICE MODELING

[V L S I]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Write in detail about potential balance and charge balance of two terminal MOS structure.	6 Marks	L1	CO1	PO1
	b)	Categorize the different Regions of inversions in MOS structure.	6 Marks	L4	CO1	PO1
		(OR)				
2.	a)	Explain in detail about pinch-off voltage and body effect.	6 Marks	L2	CO1	PO1
	b)	Show the CV characteristics of a MOS structure.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Compare complete and simplified charge sheet models with necessary equations.	6 Marks	L2	CO1	PO1
	b)	Illustrate the general charge sheet models.	6 Marks	L2	CO1	PO1
		(OR)				
4.	a)	Show the necessary diagrams of IDS-VDS characteristics in weak inversion with VGS as a parameter and explain the comparison to weak and strong inversion equations.	6 Marks	L1	CO1	PO1
	b)	Compare and contrast the regions of operation of a transistor.	6 Marks	L2	CO1	PO1
		UNIT-III				
5.	a)	Show the structure of LOCUS isolated MOSFET and explain.	8 Marks	L1	CO2	PO1
	b)	Explain: i) Break down in MOS. ii) Effective threshold voltage.	4 Marks	L2	CO2	PO1
		(OR)				
6.	a)	Define Carrier velocity Saturation. Analyze its importance in small dimensions with necessary equations.	8 Marks	L2	CO2	PO1
	b)	Briefly explain short channel effects.	4 Marks	L2	CO2	PO1
		UNIT-IV				
7.	a)	Discuss in detail about terminal currents and charges in Quasi static operation under DC excitation.	6 Marks	L3	CO3	PO1
	b)	Explain the evaluation of charges in strong inversion for non-saturation with necessary expressions.	6 Marks	L2	CO3	PO1
		(OR)				
8.	a)	Explain the evaluation of charges in weak inversion of a MOS transistor with necessary expressions.	6 Marks	L2	CO3	PO1
	b)	What is Non quasi-static analysis? How is it different from Quasi-static analysis?	6 Marks	L1	CO3	PO1
		UNIT-V				
9.	a)	Compare the gate capacitances and junction capacitance with neat structures.	5 Marks	L2	CO3	PO1
	b)	Develop a low frequency small signal model for the intrinsic part of MOS Device and Explain.	7 Marks	L3	CO3	PO2
		(OR)				
10.		Develop small signal model of a MOS transistor including extrinsic capacitance and resistance.	12 Marks	L4	CO3	PO2

CODE No.: 19MT15703 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.Tech I Semester (SVEC-19) Regular/Supplementary Examinations, August - 2021

DIGITAL CMOS VLSI DESIGN

[V L S I]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Interpret the dynamic behaviour of CMOS inverter by computing the capacitances and propagation delay.	7 Marks	L2	CO1	PO1
	b)	Survey the leakage issues in dynamic CMOS circuits.	5 Marks	L4	CO1	PO1
		(OR)				
2.	a)	Let Z = (ABCDE + FGH)'. Develop a BiCMOS and Domino CMOS implementation of the Boolean function Z.	6 Marks	L4	CO1	PO2
	b)	Conclude the various dynamic CMOS designs.	6 Marks	L4	CO1	PO2
		UNIT-II				
3.	a)	Identify and summarize logic styles for pipelined structures.	6 Marks	L3	CO2	PO1
	b)	Recall the design and functionality of Bi-stable and Non Bi-stable elements.	6 Marks	L1	CO2	PO1
		(OR)				
4.	a)	Illustrate the functionality of dynamic sequential circuits.	6 Marks	L1	CO2	PO1
	b)	Develop and explain a circuit to overcome threshold voltage drops in dynamic circuits.	6 Marks	L3	CO2	PO1
		UNIT-III				
5.	a)	Apply the design considerations of a 4-bit SRAM and develop its CMOS logic diagram.	5 Marks	L3	CO3	PO2
	b)	List various types of memory classifications and explain in brief.	7 Marks	L1	CO3	PO1
		(OR)				
6.	a)	Illustrate the method of logical effort for transistor sizing.	5 Marks	L1	CO3	PO1
	b)	Model a 3T DRAM cell and explain its operation in detail.	7 Marks	L3	CO3	PO2
		UNIT-IV				
7.	a)	Explain the importance of multiplier with pipelined algorithm for future implementations.	5 Marks	L2	CO3	PO1
	b)	Show the general arrangement of 4 bit arithmetic processor.	7 Marks	L1	CO3	PO1
		(OR)				
8.	a)	Illustrate the various considerations to implement ALU functions with an adder.	6 Marks	L1	CO3	PO1
	b)	Develop a 4x4 Barrel shifter and list some of its applications.	6 Marks	L3	CO3	PO2
		UNIT-V				
9.	a)	Recall the behavioral synthesis design flow for a CMOS System.	5 Marks	L1	CO4	PO1
	b)	Identify the significance of Design Economics for future implementations in digital design.	7 Marks	L3	CO4	PO1
		(OR)				
10.	a)	What are the elements for cost to produce an integrated circuit?	6 Marks	L1	CO4	PO1
	b)	Outline the details present in Data Sheets that contribute future enhancement of digital circuits.	6 Marks	L2	CO4	PO1

CODE No.: 19MT15705 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.Tech I Semester (SVEC-19) Regular/Supplementary Examinations, August – 2021

IC FABRICATION

[V L S I]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Describe in detail evaluation of epitaxial thickness and doping.	6 Marks	L2	CO1	PO1
	b)	Compare the merits and demerits of MBE (Molecular Beam Epitaxy).	6 Marks	L4	CO1	PO1
		(OR)				
2.	a)	Define oxidation.	3 Marks	L1	CO1	PO1
	b)	Explain and justify the oxidation induced defects.	4 Marks	L2	CO1	PO1
	c)	List the rules to maintain clean room and its safety.	5 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Explain how Electron Lithography Technique is used in IC fabrication.	6 Marks	L2	CO2	PO3
	b)	Examine the reactive plasma etching techniques. Apply any one technique for IC fabrication.	6 Marks	L4	CO1	PO3
		(OR)				
4.	a)	Identify the techniques for Reactive Plasma Etching.	6 Marks	L2	CO1	PO3
	b)	Explain the process of : i) X-ray Lithography. ii) Anisotropy etch mechanism.	6 Marks	L2	CO1	PO1
		UNIT-III				
5.	a)	Briefly discuss about Fick's one dimensional diffusion theory.	6 Marks	L2	CO1	PO1
	b)	Give a brief account on doping, oxidation and properties of polysilicon.	6 Marks	L2	CO1	PO1
		(OR)				
6.	a)	Evaluate the Low Pressure CVD (LPCVD) and explain how uniform deposition can be achieved in LPCVD.	8 Marks	L5	CO1	PO1
	b)	Analyze the VLSI shallow junctions using ion implantation.	4 Marks	L4	CO1	PO1
		UNIT-IV				
7.	a)	Discuss the problems associated with Al-Cu interconnect.	6 Marks	L2	CO2	PO3
	b)	Identify the different metallization problems in processing and predict methods to eradicate or minimize the related issues.	6 Marks	L2	CO2	PO1
		(OR)				
8.	a)	Identify the problems encountered in metallization and suggest the methods to overcome them.	8 Marks	L2	CO2	PO3
	b)	Calculate the RC time constant for a 1 cm long doped polysilicon interconnection runner on 1 μm thick SiO_2. The polysilicon has a resistance of 5000Ω and a resistivity ρ of 1000$\mu\Omega$/cm.	4 Marks	L5	CO2	PO1
		UNIT-V				
9.	a)	Memorize the concept of "*beam specimen interactions that the analytical beams with materials*".	6 Marks	L1	CO3	PO1
	b)	Classify VLSI assembly technologies for multidisciplinary applications.	6 Marks	L2	CO3	PO1
		(OR)				
10.		With flow diagram, explain the generic assembly sequence for plastic and ceramic packages.	12 Marks	L2	CO3	PO3

CODE No.: 19MT15707 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.Tech I Semester (SVEC-19) Regular/Supplementary Examinations August - 2021

FPGA ARCHITECTURES

[V L S I]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Recognize the importance of FPGA and its applications.	7 Marks	L1	CO1	PO1
	b)	Implement a combinational circuit using any one of the programmable logic devices.	5 Marks	L4	CO1	PO2
		(OR)				
2.		Summarize the complex programmable logic devices and discuss.	12 Marks	L4	CO1	PO1

UNIT-II

3.	a)	Draw and explain Configurable Logic Block of Xilinx XC 3000 FPGA.	6 Marks	L2	CO2	PO1
	b)	Write short notes on I/O block of Xilinx XC 3000 FPGA.	6 Marks	L2	CO2	PO1
		(OR)				
4.		Explain library based technology mapping with suitable examples.	12 Marks	L2	CO2	PO1

UNIT-III

5.		Illustrate the One-hot design method with an example.	12 Marks	L2	CO3	PO3
		(OR)				
6.	a)	Design the state transition diagram from the following and explain.	6 Marks	L3	CO3	PO2

Present State	Next State for Input 0	Next State for Input 1
Q_0	Q_1, Q_2	Q_1
Q_1	Q_2	Q_3
Q_2	Q_1	Q_3
Q_3	Q_2	Q_2

	b)	Discuss in detail about state diagram symbols and components.	6 Marks	L4	CO3	PO1

UNIT-IV

7.		Design a data path bus using One-hot method.	12 Marks	L3	CO4	PO2
		(OR)				
8.		Explain how ASMs are used in the design of One-hot state machine.	12 Marks	L4	CO4	PO3

UNIT-V

9.		Develop the Simulating Internal Buses in General-Purpose EPLDs.	12 Marks	L3	CO5	PO2
		(OR)				
10.	a)	List the features of Micro Channel bus master interface.	6 Marks	L1	CO5	PO1
	b)	Write short notes on Two Source Bus Configurations.	6 Marks	L1	CO5	PO1

CODE No.: 19MT16303 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.Tech I Semester (SVEC-19) Regular/Supplementary Examinations August - 2021

CLOUD COMPUTING

[Computer Science]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the virtualization process involved in Amazon Web Services.	6 Marks	L2	CO2	PO1
	b)	Compare Grid computing and Cloud computing.	6 Marks	L2	CO2	PO1
		(OR)				
2.	a)	Examine how VMware turned as a pioneer in the commercial market of virtualization as a service provider.	6 Marks	L4	CO1	PO2
	b)	Compare Type-I and Type-II Hypervisors.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Explain the risks and challenges of using cloud environment.	6 Marks	L2	CO1	PO1
	b)	Distinguish public cloud and private cloud model used for deployment.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Examine the need for combining Infrastructure as a Service, Platform as a Service and Software as a Service.	6 Marks	L4	CO2	PO2
	b)	Explain the threat agents that can be considered while building cloud environment.	6 Marks	L2	CO2	PO1
		UNIT-III				
5.	a)	Explain the basic services provided in cloud environment.	6 Marks	L2	CO2	PO1
	b)	Model user authentication in Identity as a Service. Discuss with an example.	6 Marks	L3	CO2	PO2
		(OR)				
6.	a)	Outline the characteristics of Platform as a Service in cloud.	6 Marks	L2	CO2	PO1
	b)	Distinguish the characteristics of Platform as a Service and Software as a Service models with respect to specific cloud service providers.	6 Marks	L2	CO2	PO1
		UNIT-IV				
7.	a)	Identify a suitable reference model for workflow management system.	6 Marks	L3	CO2	PO2
	b)	Explain the characteristics of Message Passing Interface.	6 Marks	L2	CO2	PO1
		(OR)				
8.	a)	Explain the additional properties of application model with respect to embarrassingly parallel application.	6 Marks	L2	CO2	PO1
	b)	Summarize the achievement of using throughput computing to create a cloud environment.	6 Marks	L2	CO2	PO1
		UNIT-V				
9.	a)	Explain the types of services provided by Microsoft Azure.	6 Marks	L2	CO2	PO1
	b)	Outline the architecture for SQL Azure.	6 Marks	L2	CO2	PO1
		(OR)				
10.	a)	Explain the storage service provided through Amazon S3.	6 Marks	L2	CO2	PO1
	b)	Identify the energy management aspects used to build cloud environment in GoogleApp engine.	6 Marks	L3	CO2	PO2

CODE No.: 19MT26302 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.Tech I Semester (SVEC-19) Regular/Supplementary Examinations, August - 2021

WIRELESS SENSOR NETWORKS

[Computer Science]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	What is a wireless sensor network? What are the characteristic requirements of wireless sensor network?	6 Marks	L2	CO1	PO2
	b)	List different sensor classifications in wireless sensor network.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	What is the difference between passive and active sensors and list a few examples for each category.	6 Marks	L2	CO1	PO1
	b)	Write history of wireless sensor networks.	6 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	Differentiate between contention based protocols and schedule based protocol.	6 Marks	L2	CO2	PO1
	b)	Explain about Routing-Enhanced MAC Protocol.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Discuss about Traffic-Adaptive Medium Access contention free protocol.	6 Marks	L2	CO2	PO1
	b)	Compare IEEE 802.11 with IEEE 802.15.4 wireless MAC protocol.	6 Marks	L3	CO2	PO2
		UNIT-III				
5.	a)	List different routing metrics used in wireless sensor network and explain.	6 Marks	L2	CO2	PO1
	b)	Explain about various clustering mechanisms in wireless sensor network.	6 Marks	L2	CO2	PO2
		(OR)				
6.		Explain about Sensor Protocols for Information via Negotiation (SPIN) protocol. And also explain different models in SPIN.	12 Marks	L2	CO2	PO2
		UNIT-IV				
7.		Explain different types of security attacks in wireless sensor network.	12 Marks	L2	CO1	PO1
		(OR)				
8.	a)	Discuss various security protocols for wireless sensor network.	6 Marks	L2	CO2	PO2
	b)	Explain Localized Encryption and Authentication Protocol for security in wireless sensor networks.	6 Marks	L2	CO2	PO2
		UNIT-V				
9.	a)	Explain real life deployment related to wireless sensor networks in detail.	6 Marks	L2	CO1	PO1
	b)	What are underwater sensor nodes? Specify the functionality of these nodes.	6 Marks	L3	CO1	PO1
		(OR)				
10.		Discuss the design analysis of transition from wireless sensor network to IoT.	12 Marks	L2	CO2	PO2

CODE No.: 19MT10708 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.Tech I Semester (SVEC-19) Regular/Supplementary Examinations June - 2022

RESEARCH METHODOLOGY AND IPR

[V L S I]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the different steps involved in a research process.	6 Marks	L2	CO1	PO1
	b)	Explain the need and functions of review of literature.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Discuss the various characteristics of a good research.	6 Marks	L2	CO1	PO1
	b)	Enumerate the main objectives of research and explain them in detail.	6 Marks	L1	CO1	PO1
		UNIT-II				
3.		Distinguish between: i) Parametric and Non-Parametric tests. ii) Analysis of variance and covariance.	12 Marks	L2	CO1	PO1
		(OR)				
4.	a)	What is Chi-square test? Explain its significance in statistical analysis.	6 Marks	L3	CO2	PO1
	b)	The average number of acres burned by forest and range fires in a large New Mexico county is 4,300 acres per year, with a standard deviation of 750 acres. The distribution of the number of acres burned is normal. What is the probability that between 2,500 and 4,200 acres will be burned in any given year?	6 Marks	L3	CO1	PO2
		UNIT-III				
5.	a)	"It is only through interpretation the researcher can expose the relations and processes that underlie his findings". Explain with an example.	6 Marks	L2	CO2	PO1
	b)	What do you mean by ethics in research and elaborate what are the ethics that should be followed while leading a research?	6 Marks	L3	CO2	PO6
		(OR)				
6.	a)	Explain various techniques of interpretation of research results.	6 Marks	L3	CO2	PO5
	b)	Explain various steps involved in writing a research report.	6 Marks	L2	CO2	PO5
		UNIT-IV				
7.	a)	Explain the different types of intellectual property rights.	6 Marks	L1	CO3	PO1
	b)	Distinguish between innovation and invention.	6 Marks	L2	CO3	PO2
		(OR)				
8.		What is meant by intellectual property? Why does intellectual property need to be promoted and protected?	12 Marks	L3	CO3	PO1
		UNIT-V				
9.		What is copyright? Why should copyright be protected? What are the classes of works for which copyright protection is available in India?	12 Marks	L2	CO3	PO1
		(OR)				
10		Illustrate the application's process and registration of copyright.	12 Marks	L3	CO3	PO1

.

CODE No.: 19MT15701 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.Tech I Semester (SVEC-19) Regular/Supplementary Examinations June - 2022

ANALOG CMOS VLSI DESIGN

[V L S I]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Identify whether Channel Length Modulation exists in triode region or not. Explain briefly.	6 Marks	L3	CO1	PO1
	b)	What is the gain of the Cascode amplifier with g_m = 0.5mA/V and r_{ds} = 100KΩ.? Comment on the value of the gain obtained.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Analyze the effect of Body Biasing in MOSFETs using necessary equations.	5 Marks	L4	CO1	PO1
	b)	Construct the Cascode current mirror and show that it has high input impedance.	7 Marks	L3	CO1	PO2
		UNIT-II				
3.	a)	Develop the frequency response of a common source stage with Resistive Load with necessary equivalent circuits and hence calculate gain of the circuit.	8 Marks	L3	CO1	PO2
	b)	Explain the effect of high-frequency supply noise in differential pairs.	4 Marks	L2	CO1	PO1
		(OR)				
4.	a)	Analyze the Statistical Characteristics of Noise.	5 Marks	L4	CO1	PO1
	b)	Develop high-frequency model of a cascode stage. List the advantages of cascade stage.	7 Marks	L3	CO1	PO2
		UNIT-III				
5.	a)	Explain how to improve the output impedance by feedback.	5 Marks	L2	CO2	PO1
	b)	Develop the expression of loop gain and output resistance of current-voltage feedback amplifier.	7 Marks	L3	CO2	PO2
		(OR)				
6.	a)	Identify the necessary technique that ensures zero input-offset voltage for a two stage OP-AMP.	6 Marks	L3	CO2	PO1
	b)	Demonstrate the Effect of Feedback on Noise.	6 Marks	L2	CO2	PO1
		UNIT-IV				
7.	a)	Explain the concepts of gain and phase margins with respect to stability.	4 Marks	L2	CO3	PO1
	b)	Model a two stage op-amp to explain the trade off involved in selecting the input stage as p-channel or n-channel.	8 Marks	L3	CO3	PO3
		(OR)				
8.	a)	Demonstrate bipolar band gap references circuit and explain it.	5 Marks	L2	CO3	PO1
	b)	Apply any one appropriate technique for eliminating or moving the effect of right half plane zero in two stage CMOS op amps.	7 Marks	L3	CO3	PO3
		UNIT-V				
9.	a)	Demonstrate a switched capacitor low-pass filter and explain.	6 Marks	L2	CO4	PO1
	b)	Define Oscillator. Explain about the Ring Oscillator with an example.	6 Marks	L1	CO4	PO1

(OR)

10.	a)	Explain the basic PLL Technology.	6 Marks	L2	CO4	PO1
	b)	Recall the applications of Non-Linear analog Circuits. Explain any one of them.	6 Marks	L1	CO4	PO1

CODE No.: 19MT15702 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.Tech I Semester (SVEC-19) Regular/Supplementary Examinations June - 2022

DEVICE MODELING
[V L S I]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	What is Body effect and Body bias? Explain in detail about Body effect with necessary equations.	6 Marks	L1	CO1	PO1
	b)	Illustrate the Effects of Gate-substrate voltage on surface condition.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Show a 3 terminal MOS structure of n+ region of open circuited, short circuited and with biased voltage and explain.	6 Marks	L2	CO1	PO1
	b)	Define Pinch off voltage. Explain in detail Body effect with necessary equations.	6 Marks	L1	CO1	PO1
		UNIT-II				
3.		Show the necessary diagrams of IDS-VDS Characteristics in weak inversion with VGS as a parameter and explain the comparison to weak and strong inversion equations.	12 Marks	L2	CO1	PO1
		(OR)				
4.		Compare and constrast the regions of operation of a transistor.	12 Marks	L2	CO1	PO1
		UNIT-III				
5.	a)	Briefly explain charges and threshold voltages in enhancement nMOS transistor with the help of necessary equations.	8 Marks	L1	CO2	PO1
	b)	Explain hot carrier effects in the channel of nMOS transistor.	4 Marks	L2	CO2	PO1
		(OR)				
6.		Compare the modes of operation of NMOS depletion-mode transistor and explain.	12 Marks	L2	CO2	PO1
		UNIT-IV				
7.	a)	Identify the limitations of Quasi static Model.	6 Marks	L3	CO3	PO1
	b)	Explain the evaluation of charges in strong Inversion for saturation with necessary expressions.	6 Marks	L2	CO3	PO1
		(OR)				
8.		Construct a MOS device structure with charges and currents under DC excitation and varying terminal voltages and explain.	12 Marks	L3	CO3	PO2
		UNIT-V				
9.	a)	Develop a small signal model for the channel path of a MOS transistor in DC Operation.	8 Marks	L3	CO3	PO2
	b)	Analyze the two path view of MOS transistor in DC operation.	4 Marks	L2	CO3	PO1
		(OR)				
10.		Explain in detail about Y parameter model of MOS Device.	12 Marks	L2	CO3	PO1

CODE No.: 19MT15703 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.Tech I Semester (SVEC-19) Regular/Supplementary Examinations June – 2022

DIGITAL CMOS VLSI DESIGN
[V L S I]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Inspect the Robustness of CMOS Inverter in static behaviour.	6 Marks	L4	CO1	PO1
	b)	Explain static properties of complementary CMOS Gates.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	How do you realize Pseudo NMOS logic circuit Compare its advantage and disadvantages with respect to standard static CMOS circuit.	5 Marks	L1	CO1	PO1
	b)	Develop graphical representation of CMOS logic gate with suitable example.	7 Marks	L4	CO1	PO2
		UNIT-II				
3.	a)	Explain the operation of two phase pipelined circuit using dynamic registers.	6 Marks	L1	CO2	PO1
	b)	Compare Clock Skew and Jitter. Identify and outline the sources of clock skew and jitter.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Analyze the characteristics of advanced interconnect techniques.	5 Marks	L4	CO2	PO1
	b)	Classify and summarize interconnects.	7 Marks	L2	CO2	PO1
		UNIT-III				
5.	a)	Explain write and hold operations in a DRAM technique.	5 Marks	L1	CO3	PO1
	b)	Write short notes on Leakage current in DRAM with suitable diagram.	7 Marks	L1	CO3	PO1
		(OR)				
6.	a)	Explain basic memory architecture with neat sketch.	5 Marks	L1	CO3	PO1
	b)	Model 1 bit basic RAM binary cell and explain its read and write operation.	7 Marks	L3	CO3	PO2
		UNIT-IV				
7.	a)	Construct 7 inputs Wallace tree architecture.	5 Marks	L3	CO3	PO2
	b)	Explain booth multiplier with appropriate example.	7 Marks	L2	CO3	PO1
		(OR)				
8.	a)	How to implement arithmetic and logic operation with a standard adder? Explain with the help of logic expression.	6 Marks	L2	CO3	PO1
	b)	Make use of Baugh Worley method to perform 2‘s complement multiplication with an example.	6 Marks	L3	CO3	PO1
		UNIT-V				
9.	a)	Develop flow chart for gate array design flow.	5 Marks	L3	CO4	PO1
	b)	Summarize the method used to assess Design Economics.	7 Marks	L2	CO4	PO1
		(OR)				
10.	a)	Develop flow charts for current and ideal design approaches.	6 Marks	L3	CO4	PO1
	b)	List and assess the structured design strategies.	6 Marks	L1	CO4	PO1

CODE No.: 19MT15705 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.Tech I Semester (SVEC-19) Regular/Supplementary Examinations June - 2022

IC FABRICATION

[V L S I]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Describe the aspects of silicon vapor epitaxy process chemistry.	6 Marks	L2	CO1	PO1
	b)	Compare the merits and demerits of MBE (Molecular Beam Epitaxy).	6 Marks	L4	CO1	PO1
		(OR)				
2.	a)	Define silicon shaping.	3 Marks	L1	CO1	PO1
	b)	Explain the Czochralski crystal growing technique through flow diagram.	4 Marks	L2	CO1	PO1
	c)	List the rules to maintain clean room and its safety.	5 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Explain, how optical Lithography technique is used in IC fabrication.	6 Marks	L2	CO1	PO3
	b)	Explain X-ray Lithography.	6 Marks	L2	CO1	PO1
		(OR)				
4.	a)	Identify the techniques for Reactive plasma etching.	6 Marks	L2	CO1	PO3
	b)	Examine the development in optical lithography and the new trends in the design. List the corresponding merits and demerits.	6 Marks	L4	CO1	PO1
		UNIT-III				
5.	a)	Briefly discuss the equipment used in ion implantation.	6 Marks	L2	CO1	PO1
	b)	Explain the Fick's one dimensional equation and its solutions to communicate with IC fabrication engineering community.	6 Marks	L2	CO1	PO1
		(OR)				
6.	a)	Evaluate the Low Pressure CVD and explain how uniform deposition can be achieved in LPCVD.	8 Marks	L5	CO1	PO1
	b)	Analyze the VLSI shallow junctions using Ion implantation.	4 Marks	L4	CO1	PO1
		UNIT-IV				
7.	a)	Discuss the principles of patterning and sputtering.	6 Marks	L2	CO2	PO3
	b)	Identify the issues related with physical vapour deposition.	6 Marks	L2	CO2	PO1
		(OR)				
8.	a)	Identify the metallization choices and assess the related problems in detail.	6 Marks	L2	CO2	PO3
	b)	Calculate the RC time constant for a 1 cm long doped polysilicon interconnection runner on 1 um thick Sio2. The polysilicon has a resistance of 5000A and a resistivity ρ of 1000$\mu\Omega$cm.	6 Marks	L5	CO2	PO1
		UNIT-V				
9.	a)	Memorize Package Fabrication Technology.	6 Marks	L1	CO3	PO3
	b)	Classify VLSI assembly technologies for Multidisciplinary applications.	6 Marks	L2	CO3	PO1
		(OR)				
10.		Explain packages types and packing desired conditions used for VLSI devices.	12 Marks	L2	CO3	PO3

CODE No.: 19MT15707 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.Tech I Semester (SVEC-19) Regular/Supplementary Examinations June - 2022

FPGA ARCHITECTURES

[V L S I]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Design the given function using PLA and PAL. $F(A, B, C) = \sum m(1, 3, 7) + d(2, 4)$.	5 Marks	L3	CO1	PO2
	b)	Interpret the organizations of FPGAs and explain.	7 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Draw the Routing architecture of FPGA and explain.	6 Marks	L2	CO1	PO1
	b)	Draw the block diagram of FPGA Design flow and explain each block.	6 Marks	L2	CO1	PO1

UNIT-II

3.		Draw the Programmable logic block architecture and I/O block of Xilinx XC2000FPGA and explain.	12 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Describe the Lookup Table Technology Mapping in mis-pga.	6 Marks	L3	CO2	PO1
	b)	Draw the block diagram of logic synthesis and explain each block.	6 Marks	L2	CO2	PO1

UNIT-III

5.		Explain about Derivations of State Machine Charts.	12 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Develop the state transition table from the Figure 1 and explain.	6 Marks	L3	CO3	PO2

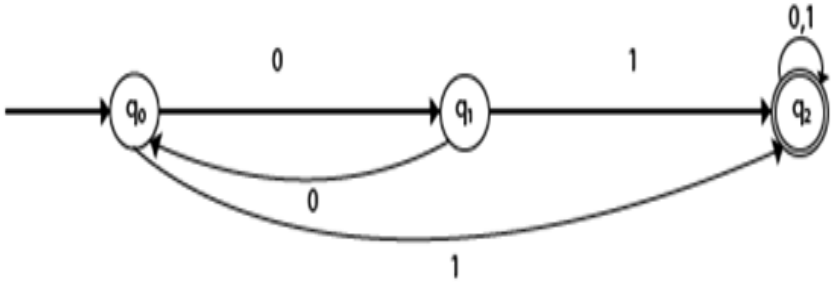


Figure 1

	b)	Design the state transition diagram from the Figure 2 and explain.	6 Marks	L4	CO3	PO2

Present State	Next State for Input 0	Next State for Input 1
Q_0	Q_0	Q_1
Q_1	Q_1, Q_2	Q_2
Q_2	Q_1	Q_3
Q_3	Q_2	Q_2

Figure 2

UNIT-IV

7.		Discuss about Application of the One-Hot Method to a Serial 2's Complementer.	12 Marks	L2	CO2	PO1
		(OR)				
8.		Draw the Model used for architectures centered around a non registered PLD showing block symbols representing input and output conditioning circuits for the model and explain.	12 Marks	L4	CO2	PO1

UNIT-V

9.		Explain in detail about Controlling Complex CCD Imaging Systems with the EPS464 EPLD.	12 Marks	L3	CO2	PO1
		(OR)				
10.	a)	List out different design applications.	6 Marks	L1	CO1	PO1
	b)	Develop the SR latch implemented with expanders.	6 Marks	L3	CO2	PO3

CODE No.: 19MT25704 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.Tech II Semester (SVEC-19) Supplementary Examinations August – 2021

MEMORY TECHNOLOGIES

[V L S I]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Summarize schematic cross section of a GaAs SRAM memory cell.	9 Marks	L2	CO1	PO1
	b)	Criticize what are the necessary steps to add to obtain high performance CMOS from Core CMOS process.	3 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Demonstrate Three Transistor DRAM cell with neat sketch.	6 Marks	L3	CO1	PO1
	b)	Construct a simple Trench cell structure of DRAM.	6 Marks	L3	CO1	PO1

UNIT-II

3.	a)	Write short notes on CMOS PROMs.	6 Marks	L1	CO1	PO1
	b)	Explain FLOTAX technology with neat sketch.	6 Marks	L2	CO1	PO1
		(OR)				
4.	a)	Appraise the main requirements for the design of address detection circuitry.	4 Marks	L3	CO1	PO1
	b)	Classify the Flash memory architecture explain any one of the architecture with neat diagram.	8 Marks	L2	CO1	PO1

UNIT-III

5.	a)	Examine the traditional approach to memory selection and hardness assurance program for space application.	8 Marks	L3	CO2	PO3
	b)	Categorize the different reliability simulators.	4 Marks	L2	CO2	PO1
		(OR)				
6.	a)	Calculate Gamma distribution and Weibull distribution in the reliability modeling.	7 Marks	L3	CO2	PO3
	b)	Identify the various radiation hardening process issues on MOS devices.	5 Marks	L1	CO2	PO3

UNIT-IV

7.	a)	Construct the FRAM cell structure with neat sketch and explain its operation.	6 Marks	L4	CO3	PO2
	b)	Identify the importance of memory cards used in the high density memory packaging technologies.	6 Marks	L1	CO3	PO1
		(OR)				
8.	a)	Illustrate the VLSI chip on silicon technology used in 2D hybrid memory.	6 Marks	L3	CO3	PO3
	b)	Build single electron memory cell with neat sketch.	6 Marks	L4	CO3	PO2

UNIT-V

9.	a)	Model memory cell transistor layout for double buffered memory testing technique.	7 Marks	L3	CO4	PO3
	b)	Summarize the general testing requirement for the application specific memory.	5 Marks	L2	CO4	PO1
		(OR)				
10.	a)	Discuss the commonly used error detection and correction codes used in the memory chip and cards.	8 Marks	L2	CO4	PO3
	b)	Identify the functional faults usually occur in nonvolatile memory modeling.	4 Marks	L1	CO4	PO1

Adjustments:

1. Closing stock on 31st March,2002 was Rs. 35,000.
2. Depreciate Plant & Machinery, Tools and Furniture by 10% and Land and Buildings by 5%.
3. Provide Rs. 1,500 for wages.
4. advertisements prepaid Rs.500.
5. Provide 5% on debtors against bad debts and 2 % against discount on creditors.

M.B.A. DEGREE EXAMINATION, MAY/JUNE - 2022
FIRST SEMESTER
PAPER - 104 : ACCOUNTING FOR MANAGERS

(Revised Regulations w.e.f. 2021-2022)

(Common Paper to University & Affiliated Colleges)

Time : 3 Hours **Max. Marks : 70**

PART - A
(Descriptive/Numerical type questions)

Answer any **FIVE** Questions. Each question carries **10** marks. **(5×10=50)**

1. What are the Accounting Concepts and Conventions? Name them and explain any two accounting concepts in detail.

2. The following is the Trial Balance as on 31-12-2021. Prepare Trading and Profit and Loss Account and Balance Sheet.

Debit Balances:	**Rs.**
Stock (1-1-2021)	14,000
Purchases	1,26,000
Production wages	50,500
Salaries	16,000
Carriage Inward	9,100
Rent and Rates	5,200
Insurance	1,320
Machinery	52,000
Building	67,000
Sundry Debtors	44,000
Furniture	3,350
General expenses	2,600
Cash in hand	1,930
Bad debts	1,020
Bank	6,580
Credit Balances:	
Sales	2,20,000
Capital	1,45,600
Sundry Creditors	20,000
Secured Loans	15,000

Adjustments to be made:

a) Stock on 31-12-2021 Rs.20,000

b) Depreciate machinery at 10% p.a.

c) Make provision @ 5% for bad and doubtful debts.

d) Provide discount on debtors @ 2.5%.

e) Insurance prepaid Rs. 120

3. Discuss the nature and causes of Depreciation.

4. On 1.1.2001, X Ltd., purchased a machinery for Rs. 58,000 and spent Rs. 2,000 on its erection. On 1.7.2001 an additional machinery costing Rs.20,000 was purchased on 1.7.2003. The machine purchased on 1.1.2001 was sold for Rs. 28,600 and on the same date, a new machine was purchased at a cost of Rs 40,000.
Show the machinery Accounting for the first four calendar years according to written down value method of depreciation taking the rate @10% p.a.

5. State the essentials of a good budgetary control system.

6. For production of 10,000 electrical irons, the budget expenses are:

	Rs.		Rs.
Raw material	60	Selling expenses(10% fixed)	15
Direct labour	25	Direct variable expenses	10
Variable overheads	20	Administrative expenses (Rs. 1,00,000)	10
Fixed overheads (Rs.1,00,000)	10	Distribution expenses(20% fixed)	10
			160

Prepare a budget for production of a (a) 8,000 units and
(b) 6000 units.
Assume that administrative expenses are rigid for all levels of production.

7. Explain the process of creating a company in Tally ERP 9.

8. Explain the Role of Computers in Accounting Information Systems.

9. What is inflation accounting? Explain the advantages and disadvantages of inflation accounting.

10. What is Human Resource Accounting? Explain the advantages and limitations of Human Resource Accounting.

PART - B
(Case Analysis)

(20)

11. Read the case given below and answer the questions given at the end:
Prepare Trading and Profit and Loss Account for the year ended 3st March, 2002 and Balance Sheet as at that date from the following trial Balance of M/s Raj & Co.,

Dr. Balances	Rs.	Cr. Balances	Rs.
Drawings	45,000	Capital	1,60,000
Goodwill	80,000	Bills Payables	33,800
Land & Buildings	60,000	Creditors	70,000
Plant & Machinery	40,000	Purchase Returns	2,650
Loose Tools	3,000	Sales	4,18,000
Bills Receivables	3,000		
Stock 1.April,2001	40,000		
Purchases	2,51,000		
Wages	20,000		
Carriage Outwards	500		
Carriage Inwards	1,000		
Coal	5,800		
Salaries	35,000		
Rent, Rates & Taxes	2,800		
Discount	1,500		
Cash at Bank	25,000		
Cash in Hand	400		
Sundry Debtors	45,000		
Repairs	1,800		
Printing & Stationary	500		
Bad Debts	1,200		
Advertisements	3,500		
Sales Returns	2,000		
Furniture	11,200		
General Expenses	5,250		
	6,84,450		**6,84,450**

Net Profit – 73530

292430

[Total No. of Pages : 3 4-75-101R

M.B.A. DEGREE EXAMINATION, MAY/JUNE - 2022
FIRST SEMESTER
PAPER - 101 : MANAGEMENT AND ORGANISATIONAL BEHAVIOUR
(Revised Regulations w.e.f. 2021-2022)
(Common Paper to University & Affiliated Colleges)

Time : 3 Hours **Max. Marks : 70**

PART - A
(Descriptive/Numerical type questions)

Answer any **FIVE** questions. Each question carries **10** marks. **(5×10=50)**

1. "There can be no control without a plan and plans cannot be successfully implemented in the absence of controls." Discuss with examples.

2. Briefly discuss techniques used in different steps involved in decision-making. Describe how to overcome barriers to effective decision-making, citing examples.

3. Do you think that "people behave on the basis of their perception of reality"? Discuss and explain the process of perception. Also describe the factors influencing perception.

4. What do you mean by personality? Critically examine various theories of personality.

5. Critically examine 'ERG theory' and 'McClelland's theory' of motivation, How are these theories applicable to work motivation?

6. Do you think that individuals and different groups in the organisations use variety of power tactics to obtain power? Discuss and explain the sources of power in an organisation.

7. Describe and discuss the dimensions and determinants of organisational culture.

8. Briefly discuss the Antecedents of Organizational Change and the various strategies to cope with change by citing examples.

9. What is Organisational Stress? Explain how stress leads to burnout with examples.

10. What is an Organisation Development Intervention? Explain its purpose. Briefly discuss advantages and disadvantages of any two types of interventions. Give examples.

PART-B

(Case Analysis)

(20)

11. Read the case given below and answer the questions given at the end:

Robert, one of the field sales managers of Major Tools Ltd., had been promoted to his first headquarters assignment as an assistant product manager for a group of products with which he was relatively unfamiliar. Shortly after he had taken over this new assignment. One of the company's Vice Presidents, Smith called for a meeting of product managers and other staff to plan marketing strategies. Robert's superior (the product manager) was unable to attend, So the director of marketing, Reynolds, invited Robert to the meeting to help and orient him to his new job.

Because of the large gathering, Reynolds was rather brief in introducing Robert to Smith. After the meeting began, Smith — a crusty veteran with a reputation for bluntness — began asking a series of probing questions, which most of the product managers were unable to answer in detail. Suddenly, he turned to Robert and questioned him quite closely about his group of products. Somewhat confused, Robert confessed that he really did not know the answers.

It was immediately apparent to Reynolds that Smith had forgotten or had failed to understand that Robert was new to the job and was attending the meeting more for his own orientation than to contribute to it. He was about to offer a discreet explanation when Smith, visibly annoyed with what he took to be Robert's lack of preparation, snapped, "Gentlemen, you have just seen an example of sloppy staff work, and there is no excuse for it."

Reynolds had to make a quick decision. He could interrupt Smith and point out that he had judged Robert unfairly, but that might embarrass both his superior and his subordinate. Alternatively, he could wait until after the meeting and offer an explanation in private. As Smith quickly became engrossed in another conversation, Reynolds followed the second approach. Glancing at Robert, Reynolds noted that his expression was one of mixed anger and dismay. After catching his eye, Reynolds winked at Robert as a discreet reassurance that he understood and that the damage could be repaired. After an hour, Smith, evidently dissatisfied with what he termed the 'inadequate planning' of the marketing department in general, abruptly declared the meeting over. As he did so, he turned to Reynolds and asked him to remain behind for a moment. To Reynolds' surprise, Smith immediately raised the question of Robert himself. In fact, it turned out to have been his main reason for asking Reynolds to remain behind. "Look," he said, "I want you to tell me frankly, do you think I' was too rough with that kid?" Relieved, Reynolds said "Yes, you were. I was going to speak to you about it."

Smith explained to Reynolds. That Robert was new to his job had not registered in his mind adequately when they had been introduced, and that it was only sometime after his own outburst that the nagging thought began to occur to him that what he had done was inappropriate and unfair. "How well do you know him?" he asked. "Do you think I hurt him?"

For a moment Reynolds took the measure of his superior. Then he replied evenly, "I do not know him very well yet, but yes, I think you hurt him."

"Damn, that is unforgivable," said Smith. He then telephoned his secretary to call Robert and ask him to report to his office immediately. A few moments later, Robert returned, looking perplexed and uneasy. As he entered, Smith came out from behind his desk and met him in the middle of the office. Standing face to face with Robert, who was 20 years and four organization levels his junior, he said, "Look. I have done something stupid and I want to apologize. I had no right to treat you like that. 1 should have remembered that you were new to your job but I did not. I am sorry.",

Robert was somewhat flustered. He muttered his thanks for the apology. "As long as you are here, young man," Smith continued, "I want to make a few things clear to you in the presence of your boss's boss. Your job is to make sure that people like me do not make stupid decisions. Obviously, we think you are qualified for your job or we would not have brought you in here. But it takes time to learn any job. Three months from now I will expect you to know the answers to any questions about products. Until then," he said, thrusting out his hand for the younger man to shake, "You have my complete confidence. And thank you for letting me correct a mistake."

Questions

(a) Discuss the impact of Smith's outburst on the organizational members.

(b) What do you think the apology meant to Robert?

(c) What is the most important aspect of the relations between management levels in this company

---

[Total No. of Pages : 2 4-75-105R

M.B.A. DEGREE EXAMINATION, MAY/JUNE - 2022
FIRST SEMESTER
PAPER - 105 : QUANTITATIVE ANALYSIS FOR MANAGEMENT DECISIONS
(Revised Regulations w.e.f. 2021-2022)
(Common Paper to University & Affiliated Colleges)

Time : 3 Hours **Max. Marks : 70**

PART - A
(Descriptive/Numerical type questions)

Answer any **FIVE** Questions. Each question carries **10** marks. (5×10=50)

1. Discuss the significance and scope of quantitative techniques for managers in business and industry.

2. Given the function

$$f(x)=\begin{cases}15 & x<-4\\ 6-2x & x\geq -4\end{cases}$$

Evaluate the following limits, if they exist

1. $\lim_{x\to +7} f(x)$ 2. $\lim_{x\to -7} f(x)$

3. A slider in a machine moves along a fixed straight rod. Its distance X cm along the rod is given below for various values of the time t seconds. Find the velocity of the slider and its acceleration when t=0.3 seconds.

T	0	0.1	0.2	0.3	0.4	0.5	0.6
x	30.13	31.62	32.87	33.64	33.95	33.81	33.24

4. What is minimax-maximin principle? Explain in detail?

5. Find the sum of geometric series 2+6+18+54+..... Where there are 6 terms in the series.

6. Define arithmetic progression? Explain the sum of arithmetic series.

7. Using row operations, workout the rank of the matrix

$$A=\begin{bmatrix}1 & 1 & 0 & -1\\ 0 & 2 & -2 & 1\\ 3 & 2 & 0 & -4\\ 1 & -2 & a & 0\end{bmatrix}$$

Where 'a' is the real parameter. (Keep in mind that the rank of A depends on the value of 'a' so a case distinction is required.

8. Solve the linear system

$3x + 2y - z = 10$

$5x - y - 4z = 17$

$X + 5y + \alpha z = \beta$

Where α, β are arbitrary real parameters using row reduction on the augmented matrix.

9. Use Dominance property to solve the following game

	B1	B2	B3	B4	B5
Al	4	4	2	-4	-6
A2	8	6	8	-4	0
A3	10	2	4	0	12

10. Consider the game of matching coins. Two players A and B put down a coin. If coins match i.e., both are head or both are tails, A gets rewarded by 1 otherwise B. however matching on heads gives a double premium. Obtain the best strategies for both players and the value of the game.

PART - B
(Case Analysis)

(20)

11. Read the case given below and answer the questions given at the end :

Solve the problem by using dominance property

	B1	B2	B3
A1	30	40	-80
A2	0	15	-20
A3	90	20	50

[Total No. of Pages : 2 4-75-106R

M.B.A. DEGREE EXAMINATION, MAY/JUNE - 2022
FIRST SEMESTER
PAPER - 106 : BUSINESS STATISTICS
(Revised Regulations w.e.f. 2021-2022)
(Common Paper to University & Affiliated Colleges)

Time : 3 Hours **Max. Marks : 70**

PART - A

(Descriptive/Numerical type questions)

Answer any **FIVE** questions. Each question carries **10** marks. **(5×10=50)**

1. Find out the Geometric Mean from the following data

Yield of Wheat (mounds)	7.5-10.5	10.5-13.5	13.5-16.5	16.5-19.5	19.5-22.5	22.5-25.5	25.5-28.5
No. of farms	5	9	19	23	7	4	1

2. Calculate Mean deviation for mean and median for the following data

Sales ('000)	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of days	5	6	8	15	17	7	9	3

3. Calculate Karl Pearson Correlation Coefficient for the following data.

X	4	7	11	14	19	15
Y	18	16	17	19	19	21

4. Define Regression? Explain various properties of Multiple Regression?

5. Explain various types of index numbers?

6. For the following data prove that the Fisher's index satisfies both the Time Reversal Test and Factor Reversal Test and calculate its value.

Commodity	Base Year		Current Year	
	Price	Quantity	Price	Quantity
A	6	50	10	56
B	2	100	2	120
C	4	60	6	60
D	10	30	12	24

7. State and prove the addition theorem of probability for 'n' events

8. A card is drawn from a well-shuffled pack of playing cards. What is the probability that it is either a spade or a king?

9. Define Hypothesis? Explain its testing procedure?

10. The following data from a study in which random samples of the employees of three government agencies were asked questions about their pension plan.

	Agency I	Agency II	Agency III
For the pension Plan	67	84	109
Against the pension plan	33	66	41

Use the 0.01 level of significance to test the null hypothesis that the actual proportions of employees favoring the pension plan are the same.

PART-B
(Case Analysis)

(20)

11. Read the case given below and answer the questions given at the end

Prepare the analysis of variance for the following data relating to per acre production data of wheat

Type of land	Type of seeds		
	A	B	C
W	6	5	5
X	7	5	4
Y	3	3	3
Z	8	7	4

[Total No. of Pages : 2 4-75-107R

M.B.A. DEGREE EXAMINATION, MAY/JUNE - 2022
FIRST SEMESTER
PAPER - 107 : MODELLING WITH EXCEL (ON LINE)
(Revised Regulations w.e.f. 2021-2022)
(Common Paper to University & Affiliated Colleges)

Time : 3 Hours **Max. Marks : 70**

PART - A

(Descriptive/Numerical type questions)

Answer any **FIVE** Questions. Each question carries 10 marks. **(5×10=50)**

1. Define Modelling? Explain various types of business models.
2. What are various rules for model design in modelling?
3. Briefly discuss about pivot table with suitable examples?
4. Explain the process of creating dynamic charts using excel?
5. Define capital budgeting? Explain its methods.
6. Explain in detail about various financial analysis techniques.
7. Explain various metrics of computing marketing in detail.
8. What are the various strategies of revenue management?
9. Briefly explain various steps in lot sizing methods.
10. Define project management? Explain its purpose and importance.

PART - B

(Case Analysis)

(20)

11. Read the case given below and answer the questions given at the end :

In June 1993, Kombs Engineering had grown to a company with $25 million in sales. The business base consisted of two contracts with the U.S. Department of Energy (DOE), one for $15 million and one for $8 million. The remaining $2 million consisted of a variety of smaller jobs for $15,000 to $50,000 each. The larger contract with DOE was a five-year contract for $15 million per year. The contract was awarded in 1988 and was up for renewal in 1993. DOE had made it clear that, although they were very pleased with the technical performance of Kombs, the follow-on contract must go through competitive bidding by law. Marketing intelligence indicated that DOE intended to spend $10 million per year for five years on the follow-on contract with a tentative award date of October 1993. On June 21, 1993. the solicitation for proposal was received at Kombs. The technical requirements of the proposal request were not considered to be a problem for Kombs. There was no question in anyone's mind that on technical merit alone, Kombs would win the contract. The more serious problem was that DOE required a separate section in the proposal on how Kombs would manage the $10 million/year project as well as a complete description of how the project management system at Kombs functioned. When Kombs won the original bid in 1988, there was no project management requirement. All projects at Kombs were accomplished through the traditional organizational structure. Line managers acted as project leaders.

In July 1993, Kombs hired a consultant to train the entire organization in project management. The consultant also worked closely with the proposal team in responding to the DOE project management requirements. The proposal was submitted to DOE during the second week of August. In September 1993, DOE provided Kombs with a list of questions concerning its proposal. More than 95 percent of the questions involved project management. Kombs responded to all questions. In October 1993, Kombs received notification that it would not be granted the contract. During a post-award conference, DOE stated that they had no "faith" in the Kombs project management system. Kombs Engineering is no longer in business.

Questions:

1. What was the reason for the loss of the contract?
2. Could it have been averted?
3. Does it seem realistic that proposal evaluation committees could consider project management expertise to be as important as technical ability?

[Total No. of Pages : 2 4-75-102R

M.B.A. DEGREE EXAMINATION, MAY/JUNE - 2022
FIRST SEMESTER
PAPER - 102 : MANAGERIAL COMMUNICATION

(Revised Regulations w.e.f. 2021-2022)

(Common Paper to University & Affiliated Colleges)

Time : 3 Hours **Max. Marks : 70**

PART - A

(Descriptive/Numerical type questions)

Answer any **FIVE** Questions. Each question carries **10** marks. **(5×10=50)**

1. Communication is two-way process. Discuss.
2. State the barriers of communication and methods of overcoming them.
3. Mention any three (unexpected) situations that may arise in public speaking and state how you would handle them.
4. Distinguish clearly between:
   a. Kinesics and proxemics; and
   b. Speaking extemporaneously and speaking impromptu.
5. What are the various steps that involve in writing a Business Letters? Discuss
6. Prepare a Memo Report for circulating to all employees of your organization announcing a change in the working hours and explaining the reasons for the change.
7. Describe the ways of improving listening as a skill. Also list the benefits that would accrue to you if you improve your listening skill.
8. What is the importance of non-verbal communication techniques? .Justify your answer with examples.
9. Discuss communication etiquette to be followed in an organization with employees from Asia and USA.
10. Explain various technology based communication tools?

PART - B

(Case Analysis)

(20)

11. Read the case given below and answer the questions given at the end:

Assume that you are the Secretary of your college Students' Union. You are expected to plan the various extra —curricular activities of' students.

Questions:

a. Now prepare Notice and Agenda.

b. Write the Minutes of the above meeting.

M.B.A. DEGREE EXAMINATION, MAY/JUNE - 2022
FIRST SEMESTER
PAPER - 103 : MANAGERIAL ECONOMICS
(Revised Regulations w.e.f. 2021-2022)
(Common Paper to University & Affiliated Colleges)

Time : 3 Hours **Max. Marks : 70**

PART - A
(Descriptive/Numerical type questions)

Answer any **FIVE** Questions. Each question carries **10** marks. **(5×10=50)**

1. What is the fundamental nature of Managerial Economics? Discuss.
2. Distinguish between profit maximization and value maximization giving examples.
3. The demand function is written as Q_d= F (Po, Pc, Ps, Yd, T, A, CR, R, E, N, 0) Describe each of this variables separately giving examples.
4. Explain the concept of price elasticity of demand and the relationship between price elasticity, total revenue and marginal revenue.
5. Explain why the average cost curve is U-shaped. The long run average cost curve is always an envelope of short run average cost curves. Discuss.
6. Explain the concept of break-even analysis with the help of examples. What strategic decisions can a manager take based on break-even analysis?
7. What is oligopoly? Differentiate oligopoly from Monopoly.
8. What is the difference between perfect competition and monopoly? Explain the price determination with diagram under perfect competition.
9. What is Gross domestic product (GDP) and Net national product'? Discuss why study of GDP is helpful in making investment decisions for a profit-aiming firm?
10. One of the most significant business and economic trends of the late twentieth century is the rise of 'global' or 'stateless' Corporation. Critically comment on the statement taking examples from the real world firms.

PART - B

(Case Analysis)

(20)

11. Read the case given below and answer the questions given at the end:

You are given to understand that the existing firm in a market derives 80% of its revenues from 20% of its customers. Your boss wants you to develop a strategy to enter this market to compete with the existing firm (incumbent). Your answer should focus on:

a) How you would target existing customers?

b) How you would seek to attract new customers?

c) It is possible that the incumbent will also change his strategy following your decision to enter. How according to you will the incumbent react?

d) What will be your counter strategy to combat the incumbent?

[Total No. of Pages : 2 12-00-1-03R

MASTER OF COMPUTER APPLICATIONS DEGREE EXAMINATION, JUNE - 2022

FIRST SEMESTER

Paper - MCA 103 : COMPUTER ORGANIZATION

(Under C.B.C.S Revised Regulations w.e.f. 2020-2021)

(Common Paper to University and all Affiliated Colleges)

Time : 3 Hours **Max. Marks : 70**

PART - A

(Compulsory)

Answer any **FIVE** of the following Questions. Each Question carries 2 marks. **(5×2=10)**

1. a) Explain the basic operational concepts of Computer with a neat diagram.
   b) What are the types of Flip-Flops?
   c) Define Register Indirect Addressing Mode? Give an Example.
   d) List out Main Memory operations in computer organization.
   e) Explain the functions of typical input-output interface.
   f) What is the use of Priority Interrupt.
   g) Explain the Address Translation in Virtual Memory.
   h) What is Cache Memory? Mention its advantages.
   i) Describe Multiple Bus Organization.
   j) What are the different forms of parallelism?

PART - B

Answer any **ONE** full question from each Unit. Each Question carries **12 marks.** **(5×12=60)**

UNIT - I

2. i) Explain Decoders and Encoders with circuit diagram.
   ii) Define PLD. Describe in detail about its types.

(OR)

3. i) Explain the interconnection structure for multiprocessor systems.

ii) Write short notes on various types of Registers.

UNIT - II

4. i) What is an Addressing Mode? Explain any three Addressing Modes with example.

ii) How computer instructions are classified? List and Explain about them with examples.

(OR)

5. i) List out Data Transfer Instructions with examples.

ii) Explain internal organization of memory chips.

UNIT - III

6. i) Explain the working principle of DMA with a neat diagram.

ii) Discuss about memory mapped I/O.

(OR)

7. i) Define an interrupt and also describe various types of interrupts.

ii) Differentiate between Synchronous and Asynchronous modes of data transfer?

UNIT - IV

8. i) Design Carry Look Ahead Adder and explain its function.

ii) Derive and explain an algorithm for adding and subtracting 2 floating point binary numbers.

(OR)

9. i) Explain in detail about Cache mapping techniques.

ii) Explain Addition and Subtraction in Signed Magnitude Data?

UNIT - V

10. i) List and explain the steps involved in the execution of a complete instruction.

ii) Write short notes on Instruction Hazards?

(OR)

11. i) Describe the basic organization of Micro Programmed control unit.

ii) Explain the bus organization of a data path with a neat diagram.

[Total No. of Pages : 2 12-00-1-04R

MASTER OF COMPUTER APPLICATIONS DEGREE EXAMINATION, JUNE - 2022

FIRST SEMESTER

Paper - MCA 104 : OPERATING SYSTEMS

(Under C.B.C.S Revised Regulations w.e.f. 2020-2021)

(Common Paper to University and all Affiliated Colleges)

Time : 3 Hours **Max. Marks : 70**

PART - A

(Compulsory)

Answer any **FIVE** of the following Questions. Each Question carries 2 marks. **(5×2=10)**

1. a) Describe Storage Hierarchy.

b) Write a short note on Threading Issues.

c) What are the Characteristics of a Deadlock? Explain.

d) Define Semaphores and Monitors.

e) Differentiate between File and Directory.

f) Define Virtual Memory. Why is its need?

g) Differentiate between Scan and C-Scan algorithms.

h) Explain Disk structure in brief.

i) Differentiate between Worms and Viruses.

j) Write a brief note on the Components of a Linux System.

PART - B

Answer any **ONE** full question from each Unit. Each Question carries **12 marks.** **(5×12=60)**

UNIT - I

2. i) Explain different categories of system Programs.

ii) Describe about System Design and Implementation.

(OR)

3. Write a detailed note on Communication in Client Server System.

UNIT - II

4. How to avoid Deadlocks? Write and explain Banker's Algorithm.

(OR)

5. What is meant by Co-operating Processes? Briefly explain the algorithms of Two Process Solutions to Critical Section problem.

UNIT - III

6. i) Compare and contrast Paging and Segmentation.

   ii) Write a note on File Sharing Protection.

(OR)

7. Elaborate on Allocation Methods of Disk space.

UNIT - IV

8. Write a detailed note on Transforming I/O request to Hardware Operations with necessary figure of life cycle of an I/O request.

(OR)

9. Describe in detail about RAID structure.

UNIT - V

10. i) Explain how to verify User Authentication.

    ii) What are Security System Facilities? Explain.

(OR)

11. Explain in detail about Linux System Design Principles and Kernel Modules.

1121165

[Total No. of Pages : 2 12-00-1-02R

MASTER OF COMPUTER APPLICATIONS DEGREE EXAMINATION, JUNE - 2022

FIRST SEMESTER

Paper - MCA 102 : OBJECT ORIENTED PROGRAMMING WITH JAVA

(Under C.B.C.S Revised Regulations w.e.f. 2020-2021)

(Common Paper to University and all Affiliated Colleges)

Time : 3 Hours **Max. Marks : 70**

PART - A

Answer any **FIVE** of the following Questions. Each Question carries 2 marks. (5×2=10)

1. a) Write about Object Oriented Programming Concepts.

   b) Explain about Constructors with an example.

   c) Write about try and catch blocks in detail with an example.

   d) Illustrate the process of creating a thread.

   e) Write a program to accept number from user and convert into binary by using wrapper class.

   f) Discuss about Character stream.

   g) Write about Applet Life Cycle.

   h) How do applets differ from application programs explain with example?

   i) Discuss about Internet Address.

   j) Write about the performance of JDBC.

PART - B

Answer any **ONE** full question from each Unit. Each Question carries **12 marks.** (5×12=60)

UNIT - I

2. i) What is a Constructor? Write about different types of Constructors? Explain how to invoke a constructor in a program?

   ii) Why do we need Nested classes in java programming? Explain the types of non-static nested classes with an example Program.

(OR)

3. i) Write different types of inheritances in Java and give an example for each.

ii) What is method overriding? Illustrate the concepts of method overriding with an example. Is constructor overriding is possible in Java?

UNIT - II

4. i) What is an Interface? Give the general form of an Interface and also discuss the implementation details of Interfaces.

ii) How to handle multiple catch blocks for a nested try block? Explain with an example.

(OR)

5. i) Write a program to explain thread priorities usage.

ii) Explain the synchronization of multiple threads in Java with an example.

UNIT - III

6. i) Write about Character class in detail with an example.

ii) Give the difference between Array and Vector and explain about.

(OR)

7. i) Explain about String Tokenizer with an example.

ii) Distinguish between Byte Stream and Character Stream.

UNIT - IV

8. i) What is the role of event listeners in event handling ? List the Java event listeners.

ii) Write an applet to display the mouse cursor position in that applet window.

(OR)

9. i) Discuss various AWT containers with examples.

ii) Explain about the adapter class with an example.

UNIT - V

10. i) Write about Factory Method in detail.

ii) With an example program briefly explain about Socket in detail.

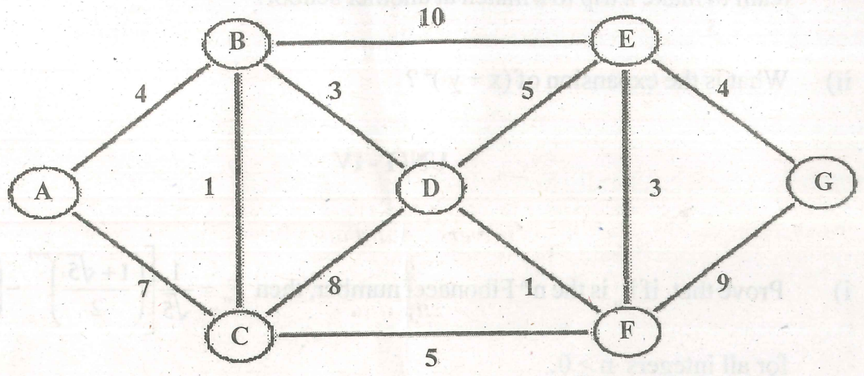
(OR)

11. i) Describe different types of JDBC drivers.

ii) Explain about the procedure of preparing SQL statements in detail.

---

ii) Use Dijkstra's algorithm to find the length of a shortest path between the vertices A and G in the weighted graph shown below:



(OR)

11. i) Show that K_n has a Hamilton circuit whenever $n \geq 3$.

ii) Write about Graph Coloring and show how can the final exams at a university be scheduled so that no student has two exams at the same time?

1121165

[Total No. of Pages : 4 12-00-1-01R

MASTER OF COMPUTER APPLICATIONS DEGREE EXAMINATION, JUNE - 2022

FIRST SEMESTER

Paper - MCA 101 : DISCRETE MATHEMATICAL STRUCTURES

(Under C.B.C.S Revised Regulations w.e.f. 2020-2021)

(Common Paper to University and all Affiliated Colleges)

Time : 3 Hours **Max. Marks : 70**

PART - A

(Compulsory)

Answer any **FIVE** of the following Questions. Each Question carries **2** marks. **(5×2=10)**

1. a) Show that $\neg(p \vee q)$ *and* $\neg p \wedge \neg q$ are logically equivalent.

b) Let Q(x) be the statement "x < 2." What is the truth value of the quantification $\forall x Q(x)$, where the domain consists of all real numbers?

c) Give a recursive definition of a^n, where a is a nonzero real number and n is a nonnegative integer.

d) Write about Well-Formed formulae in Propositional Logic.

e) How many permutations of the letters ABCDEFGH contain the string ABC?

f) How many poker hands of five cards can be dealt from a standard deck of 52 cards? Also, how many ways are there to select 47 cards from a standard deck of 52 cards?

g) What is the solution of the recurrence relation $a_n = 6a_{n-1}$-l-$9a_{n-2}$ With $a_0 = 1$ and $a_1 = 6$?

h) Define linear nonhomogeneous recurrence relation of degree k with constant coefficients.

i) Write about Dirac's Theorem with proof.

j) Give the difference between Euler path and circuit.

PART - B

Answer any **ONE** full question from each Unit. Each Question carries **12 marks.**

(5×12=60)

UNIT - I

2. i) Obtain principal conjunctive normal form (PCNF) for the formula $(\sim p \rightarrow r) \wedge (q \leftrightarrow p)$

   ii) Show that the following is inconsistent $P \rightarrow Q, R \rightarrow S, P \vee R, \sim (Q \vee S)$.

(OR)

3. i) Using indirect proof. Derive $P \rightarrow \sim S$ from $P \rightarrow Q \vee R$, $Q \rightarrow \sim P, S \rightarrow \sim R, P$.

   ii) Show that $R \rightarrow (S \rightarrow Q)$, $\sim P \vee R$ and $S \Rightarrow P \rightarrow Q$

UNIT - II

4. i) What is mathematical induction? Use mathematical induction to prove that 1.1! + 2.2!+...+n.n!= (n+1)!-1, wherever n is a positive integer.

   ii) Write about Recursively Defined Function in detail and Give a recursive definition of $\sum_{K=0}^{n} a_K$

(OR)

5. i) Using structural induction, Show that whenever $n \geq 3, f_n > a^{n-2}$, Where $a = (1+\sqrt{5})/2$.

   ii) Give a recursive algorithm for computing a^n, where a is a nonzero real number and n is a nonnegative

UNIT - III

6. i) Write about Pigeonhole Principle in detail? Prove that if N objects are placed into K boxes, then there is at least one box containing at least $\left\lceil \frac{N}{K} \right\rceil$ objects.?

   ii) Define Permutation and show in how many ways are there to select a first-prize winner, a second-prize winner, and a third-prize winner from 100 different people who have entered a contest?

(OR)

7. i) Let n and r be nonnegative integers with $r \leq n$. Then prove that C (n, r) = C (n,n - r) and show that in how many ways are there to select five players from a 10-member tennis team to make a trip to a match at another school?

   ii) What is the expansion of $(x + y)^4$?

UNIT - IV

8. i) Prove that, if F_n is the n^{th} Fibonacci number, then $F_n = \frac{1}{\sqrt{5}}\left[\left(\frac{1+\sqrt{5}}{2}\right)^{n+1} - \left(\frac{1+\sqrt{5}}{2}\right)^{n+1}\right]$ for all integers $n \geq 0$.

   ii) Solve the recurrence relation $a_n - a_{n-1} - 12a_{n-2} = 0, a_0 = 0, a_1 = 1$.

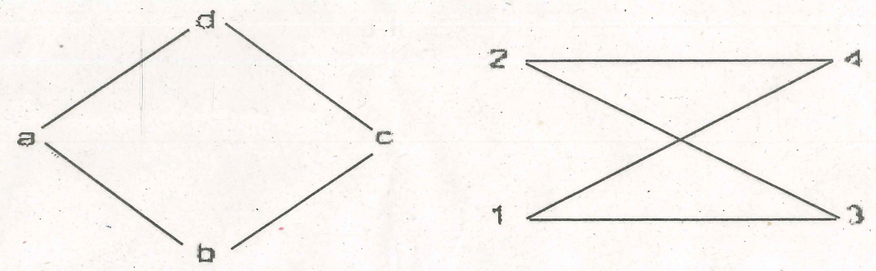
(OR)

9. i) Discuss about Principle of Inclusion - Exclusion and show that how many positive integers are not exceeding 1000 are divisible by 7 or 11?

   ii) Solve the recurrence relation $a_k = 3a_{k-1}$ for k = 1,2,3,... and initial condition $a_0 = 2$.

UNIT - V

10. i) Show that the graphs G = (V, E) and H = (W, F) shown in below figure are isomorphic.



[Total No. of Pages : 3

112165

12-00-1-05R

MASTER OF COMPUTER APPLICATIONS DEGREE EXAMINATION, JUNE - 2022

FIRST SEMESTER

Paper - MCA 105A : ACCOUNTING AND FINANCIAL MANAGEMENT

(Under C.B.C.S Revised Regulations w.e.f. 2020-2021)

(Common Paper to University and all Affiliated Colleges)

Time : 3 Hours **Max. Marks : 70**

PART - A

(Compulsory)

Answer any **FIVE** of the following Questions. Each Question carries **2** marks. **(5×2=10)**

1. a) Define Accounting.

b) Dual aspect concept.

c) What is costing?

d) Marginal cost.

e) Current Liabilities

f) Liquid ratios

g) Variable working capital

h) Adequacy of working capital

i) Budgeting

j) Zero based budgeting

PART - B

Answer any **ONE** full question from each Unit. Each Question carries **12 marks.** **(5×12=60)**

UNIT - I

2. i) What is the scope of accounting?

ii) What are the errors disclosed by Trial Balance? Explain.

(OR)

3. i) What is the importance of accounting?

ii) What are the errors not disclosed by Trial Balance ? Explain.

UNIT - II

4. i) Define Cost Accounting and discuss the nature and scope of cost accounting.

ii) Classify costs with examples.

(OR)

5. i) Explain the uses of break-even analysis in profit planning.

ii) Explain the functions of cost accounting.

UNIT - III

6. i) State the limitations of ratio analysis.

ii) Comment on the liquidity of the following companies.

	Company A	Company B
	Rs.	Rs.
Cash	180	140
Debtors	1,420	3,200
Stock	1,800	5,400
Bills payable	270	1,000
Creditors	500	4,000
Accrued expenses	150	125
Tax Payable	750	1,000

(OR)

7. i) What are inter-statement ratios?

ii) Calculate current assets of company from the following:

a) Stock turnover: 5 times

b) Stock at the end : Rs 5,000 more than stock in the beginning.

c) Sales (all credit) Rs. 2,00,000

d) Gross profit ratio: 20%

e) Current liabilities Rs. 60,000

f) Quick ratio 0.75

UNIT - IV

8. i) What are the different methods of valuation of materials?

ii) Discuss the risk - return trade off in current assets financing.

(OR)

9. i) What factors should the finance manager take into consideration while estimating working capital needs of the firm?

ii) What is meant by FIFO, LIFO method?

UNIT - V

10. i) Distinguish between forecast and budget.

ii) What are budget committees?

(OR)

11. i) What are the objectives of budgetary control?

ii) What do you consider to be the purposes and special features of a flexible budget?

CODE No.: 16BT1BS01 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations, December 2022

ENGINEERING CHEMISTRY

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Discuss briefly about boiler troubles and methods to be adapted for their treatment.	14 Marks
		(OR)	
2		Explain the Ion-Exchange process for softening of water with the reactions involved and mention the advantages, disadvantages of this process.	14 Marks

UNIT-II

3	a)	Define composite material? Classify composite materials based on dispersed phase.	7 Marks
	b)	Distinguish between fibre and particle-reinforced composites.	7 Marks
		(OR)	
4		What are biodegradable polymers? Explain the classification of Biodegradable polymers. Give the potential applications of biodegradable polymers.	14 Marks

UNIT-III

5		Write the applications of nanomaterials in science and technology.	14 Marks
		(OR)	
6		Explain in detail about the classification of nanomaterials	14 Marks

UNIT-IV

7		Describe the construction and working of Lithium- ion battery with the reactions occurring during charging and discharging. Mention the applications of Li-ion batteries.	14 Marks
		(OR)	
8		Discuss the construction and working principle of Ni-Cd battery. List out the applications of Ni-Cd batteries	14 Marks

UNIT-V

9		Define lubrication. Explain mechanism of fluid and boundary lubrication	14 Marks
		(OR)	
10		What is lubrication? Write an explanatory note on solid lubricants and greases.	14 Marks

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

TRANSFORMATION TECHNIQUES AND PARTIAL DIFFERENTIAL EQUATIONS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1 Develop the Fourier series for $f(x) = x - x^3$ in $-3 < x < 3$. 14 Marks

(OR)

2 Test the function $f(x) = \begin{cases} 1+\frac{2x}{\pi} & -\pi < x < 0 \\ 1-\frac{2x}{\pi}; & 0 < x < \pi \end{cases}$ for even and odd. 14 Marks

Also find its half range Fourier cosine series.

UNIT-II

3 Apply Parseval's identity in Fourier transforms evaluate $\int_0^\infty \frac{dx}{(4+x^2)(9+x^2)}$. 14 Marks

(OR)

4 Find the Fourier sine transform of $e^{-|x|}$ hence evaluate $\int_0^\infty \frac{x \sin mx}{a^2 + x^2} dx$. 14 Marks

UNIT-III

5 Solve $y'' + 9y = \cos 2t$, $y(0) = 1$, $y(\pi/2) = -1$ by Laplace technique. 14 Marks

(OR)

6 Solve $y'' - 5y' + 4y = e^{2t}$, $y(0) = 1$, $y'(0) = 0$, using Laplace transform method. 14 Marks

UNIT-IV

7 Using Z–transform, Solve $u_{n+2} - 2u_{n+1} + u_n = 3_{n+5}$. 14 Marks

(OR)

8 Solve the equation $y_{n+2} + 6y_{n+1} + 9y_n = 2^n$ with $y_0 = y_1 = 0$, Using Z-transform. Solve the equation $y_{n+2} + 6y_{n+1} + 9y_n = 2^n$ with $y_0 = y_1 = 0$, Using Z–transform? 14 Marks

UNIT-V

9 Obtain the solution of the equation $\frac{\partial u}{\partial t} = \frac{\partial^2 u}{\partial x^2}$ with boundary condition $u(x,0) = 3\sin n\pi x$, $u(0,t), u(l,t) = 0$ where $0 < x < l$. 14 Marks

(OR)

10 A string is stretched and fastened to two points l apart. Motion is started by displacing the string in the form $y = a \sin \frac{\pi x}{l}$ from which it is released at a time t=0. Show that the displacement of any point at a distance x from one end at time t is given by $y(x,t) = a \sin\left(\frac{\pi x}{l}\right)\cos\left(\frac{\pi ct}{l}\right)$. 14 Marks

❀ ❀ ❀

CODE No.: 16BT20102 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations, December 2022

ENGINEERING MECHANICS

[Civil Engineering and Mechanical Engineering]

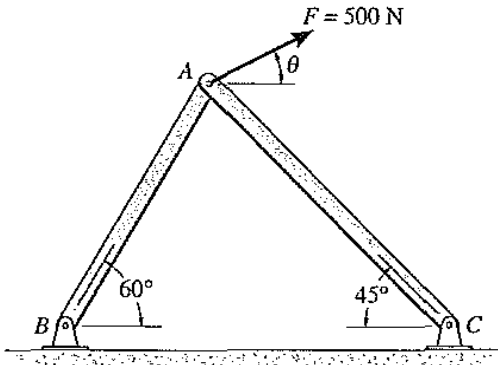
Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Discuss the following terms with suitable examples: 7 Marks
i) Coplanar forces ii) Concurrent forces
iii) Parallel forces iv) Non parallel forces

b) The 500N force acting on the frame is to be resolved into two components acting along the axis of the struts AB and AC as shown in Fig. If the component of force along AC is required to be 300 N, directed from A to C, determine the magnitude of force acting along AB and the angle q of the 500 N forces. 7 Marks



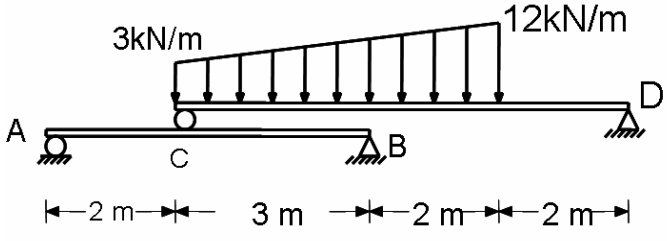
(OR)

2 a) Explain how the Parallelogram law can be used to obtain the resultant of more than two concurrent forces. 7 Marks

b) What is a resultant force? What is meant by composition of forces, component of a force and resolution of a force? Can a force be resolved into non-perpendicular components? If so, how? 7 Marks

UNIT-II

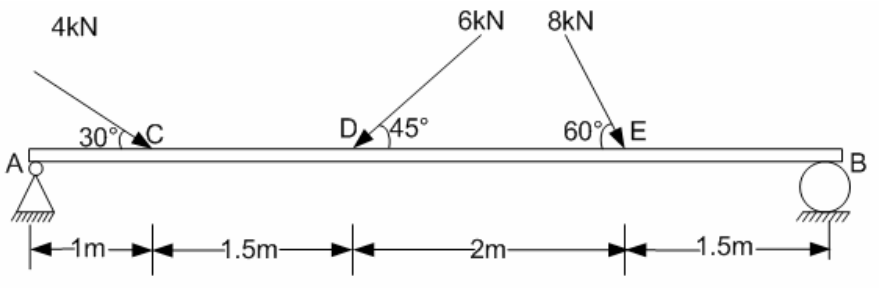
3 Calculate reactions at A, B, C and D as shown in the given figure. 14 Marks



(OR)

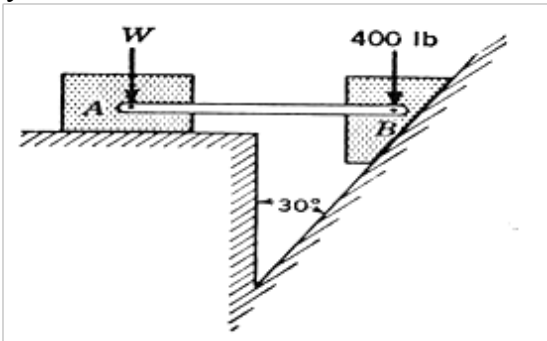
4 a) State and prove Varignon's principle. 7 Marks

b) A beam AB of span 6m is hinged at A and supported on rollers at end B and carries load as shown in Fig. Determine the reactions at A and B. 7 Marks



UNIT-III

5 Two blocks, connected by a horizontal link AB are supported on two rough planes as shown in figure. The coefficient for friction of block A on the horizontal plane is μ = 0.4. The angle of friction for block B on the inclined plane is μ =0.15. What is the smallest weight W of block A for which equilibrium of the system can exist? 14 Marks



(OR)

6 A uniform ladder of length 5m and weight 250N rests on a horizontal ground and leans against a rough vertical wall. The coefficient of static friction between ladder and the floor is 0.3 and between the ladder and vertical wall is 0.2. When a weight of 900 N is placed on the ladder at a distance of 2 m from the top of the ladder, the ladder is at the point of sliding. Determine: 14 Marks

i) The angle made by the ladder with the horizontal.

ii) Reactions at the foot and top of the ladder.

UNIT-IV

7 Find the area moment of inertia about the centroidal axes of the plane area shown in fig. Also find the section modulus. 14 Marks

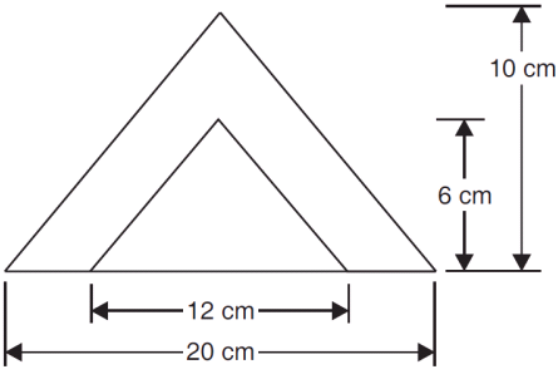
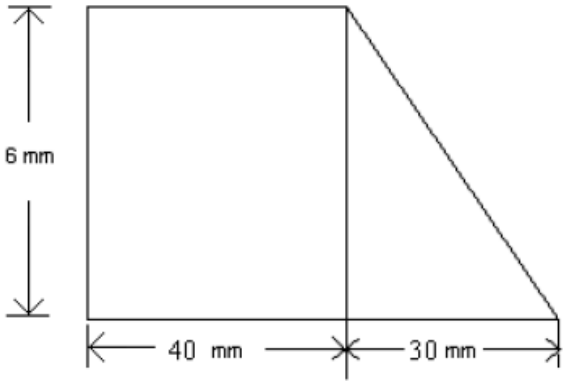


Fig.7

(OR)

8 Find the centroid of the plane area shown in figure 14 Marks



UNIT-V

9 a) A stone dropped into well is heard to strike the water in 3.5 sec. Find the depth of the well assuming the velocity of the sound is 335 m/sec. 7 Marks

b) Maximum range of a field gun is 2000 m. If a target at a distance of 1200 m is to be hit, what should be the angle of projection? 7 Marks

(OR)

10 a) A motor cycle starts from rest and speeds to 15 m/s with a constant acceleration of 1.5 m/s^2 runs at this speed for some time and finally comes to rest with a deceleration of 2 m/s^2. If total distance travelled is 400 m, determine total time required. 7 Marks

b) The motion of the particle is defined by the relation $x = 6t^4 + 8t^3 - 14t^2-10t + 16$, where x and t are expressed in meters and records, respectively. Determine the position, the velocity, and the acceleration as the particle when t = 3s. 7 Marks

CODE No.: 16BT20241 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations, December-2022

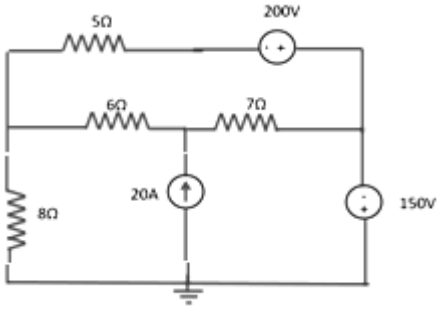
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
[Civil Engineering, Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

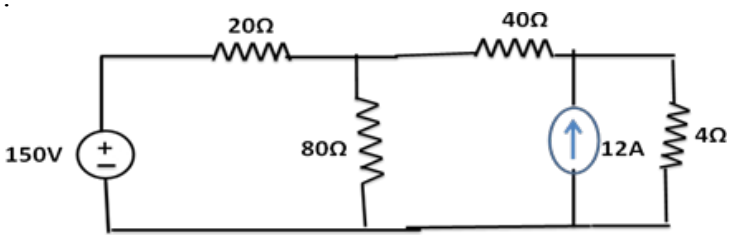
Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1 a) Compute the voltage across the 7 Ω resistor, using mesh analysis. 7 Marks

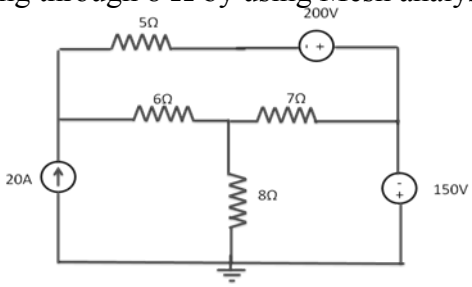


b) Use Nodal analysis to determine the current through 40 Ω resistor in the circuit given below. 7 Marks

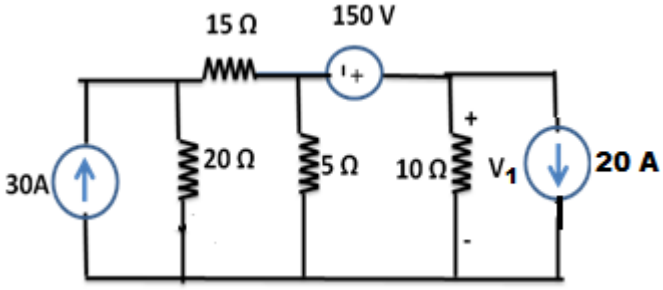


(OR)

2 a) Find the current flowing through 8 Ω by using Mesh analysis. 7 Marks



b) Compute the voltage across 10 Ω resistor V_1, using nodal analysis. 7 Marks



UNIT-II

3 A 64 mH inductor with a 700 Ω winding resistance is connected in series with a 3.3 kΩ resistor. A 10 V RMS, 5 kHz supply is applied to the circuit. Calculate the RMS value of circuit current and voltage across resistor and inductor. 14 Marks

(OR)

4	a)	A series RC circuit with R = 120 Ωand C = 3.3 μF is connected to a 12 V RMS, 1 kHz supply. Determine the circuit current, the resistor voltage, the capacitor voltage and the phase angle of the current with respect to the supply voltage. Represent the phasor diagram and impedance triangle for the circuit.	7 Marks
	b)	A coil have inductance 32 mH and resistance of 600 Ω is connected in series with 2.4 kΩ resistor. The series combination circuit was excited by 30 V RMS, 1 kHz supply. Compute the current delivered by source and voltage across resistor in coil. Also compute the power drawn from source.	7 Marks

UNIT-III

5	a)	Build a diagram of DC Machine and label the component parts. State the functions of each part.	7 Marks
	b)	The armature of 6 – pole DC generator has a wave winding containing 664 conductors. Compute the generator EMF when flux per pole is 0.06 webers and the speed is 250 rpm. At what speed must be run to generate EMF of 250 V, if the flux per pole is reduced to 0.058 webers.	7 Marks
		(OR)	
6	a)	Explain the construction and working principle of DC Generator.	7 Marks
	b)	An 8 pole DC generator has flux of 40 mWb per pole and winding is connected in lap winding with 960 conductors. Calculate the generated EMF on open circuit when it runs at 400 rpm. If the armature is wave wound at what speed must the machine be driven to generate the same voltage.	7 Marks

UNIT-IV

7	a)	What are the different types of temperature measurements? Explain.	8 Marks
	b)	State the need for transducer, explain.	6 Marks
		(OR)	
8	a)	State the difference between active and passive transducers.	7 Marks
	b)	How does thermo couple works, state the applications of thermo couples in industry.	7 Marks

UNIT-V

9	a)	Explain the operation of single phase half wave diode rectifier with neat waveforms.	6 Marks
	b)	Single phase half-wave diode rectifier is connected to 220 V, 50 Hz supply to feed 5 Ω pure resistors. Draw load voltage and current and diode voltage drop waveforms along with supply voltage. Then, calculate i) The rectification efficiency. ii) Ripple factor of load voltage and iii) Peak Inverse Voltage (PIV) of the diode.	8 Marks
		(OR)	
10	a)	Define current gains α and β. How are they related?	6 Marks
	b)	Draw I - V characteristics (Collector characteristics) for a transistor and discuss the salient features.	8 Marks

❀ ❀ ❀

CODE No.: 16BT20401 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations, December 2022

ELECTRONIC DEVICES AND CIRCUITS

[Electrical and Electronics Engineering, Electronics and Communication Engineering and Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1 a) Draw and explain the V-I characteristics of Zener diode. 7 Marks

b) A voltage of 500 cos ωt is applied to half wave rectifier with load resistance of 5kΩ. Define and derive the values of maximum DC voltage component, R.M.S. current, Ripple Factor, Transformer Utilization Factor, PIV and Rectifier Efficiency of the rectifier. 7 Marks

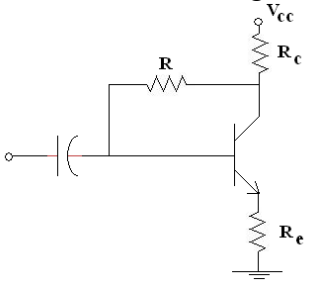
(OR)

2 a) Distinguish between avalanche and Zener mechanisms. 7 Marks

b) Derive an expression for transition capacitance. 7 Marks

UNIT-II

3 a) In the circuit shown, V_{cc} = 24V, R_c = 10K and R_e = 270Ω. If a silicon transistor is used with β = 45 and if V_{CE} = 5V, find R. Neglect reverse saturation current. 6 Marks



b) Explain the output characteristics of a transistor in CB configuration. 8 Marks

(OR)

4 a) Explain CE configuration with the help of input and output characteristics. 8 Marks

b) Explain Collector –to-base bias method and derive the expression for the stability factor. 6 Marks

UNIT-III

5 a) Derive the expressions for voltage gain, current gain, input impedance output impedance of CE amplifier, using exact and approximate model. 9 Marks

b) Draw the h-parameter model of CE configuration. 5 Marks

(OR)

6 a) Why hybrid parameters are called so? Draw the hybrid model of transistor indicating all the parameters. 5 Marks

b) A CE amplifier is driven by a voltage source of internal resistance R_s=1000 Ω and the load impedance of R_L = 1200Ω. The h–parameters are h_{ie} = 1.2 kΩ, h_{re}=2 × 10^{-4}, h_{fe} = 60 and h_{oe} = 25 μA/v. Compute the current gain, input resistance, voltage gain and output resistance using exact analysis. 9 Marks

UNIT-IV

7	a)	Explain how an FET is used as a voltage variable resistor.	6 Marks
	b)	Explain the operation of MOSFET in enhancement mode.	8 Marks
		(OR)	
8	a)	Why we call FET as A voltage controlled device?	6 Marks
	b)	What are the values of I_D and g_m for V_{GS} = -1.5V if I_{DSS} and V_P are given as 8.4mA and -3V respectively.	8 Marks

UNIT-V

9	Draw the electrical equivalent circuit of UJT and explain its operation with emitter characteristics.	14 Marks
	(OR)	
10	Explain the characteristics of tunnel diode with the help of energy band diagram.	14 Marks

CODE No.: 16BT20441 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations, December 2022

BASIC ELECTRONIC DEVICES AND CIRCUITS

[Computer Science and Engineering, Information Technology and Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1 Derive the following terms for Half wave rectifier 14 Marks
i) DC Ammeter ii) DC Voltmeter
iii) Wattmeter iv) Regulation.

(OR)

2 a) Derive the Ripple factor for Half wave rectifier and full wave rectifier. 8 Marks
b) Derive the L Section filter in full wave rectifier. 6 Marks

UNIT-II

3 a) Draw a self bias circuit. Explain why such a circuit is an improvement on the fixed bias circuit as for as stability concerned. 10 Marks
b) A BJT has base current of 200 uA and emitter current of 20 mA Determine the collector current and beta. 4 Marks

(OR)

4 a) Why is the need of stabilizing an operating point? How is it done? 10 Marks
b) A BJT has base current of 400 uA and emitter current of 50 mA Determine the collector current and beta. 4 Marks

UNIT-III

5 a) Draw the small signal model of JFET. 10 Marks
b) A FET amplifier in the common source configuration uses a load resistance of 250 K ohms and the transconductance is 0.5 mA/V. What is the voltage gain of the amplifier given drain resistance is 200 K Ohms. 4 Marks

(OR)

6 a) Explain the enhancement MOSFET with neat sketches. 10 Marks
b) What are the two types of MOSFET How do they differ in their structure? 4 Marks

UNIT-IV

7 a) Draw the circuit of Colpitts oscillator and explain its working. Derive the expression for frequency of oscillation. 10 Marks
b) In colpitts oscillator C_1=0.16 uF, L =15.8 mH and its frequency of oscillation is 10 K Hz, Calculate the value of capacitor C_2. 4 Marks

(OR)

8 a) Draw the circuit of RC phase shift oscillator and explain its working. Derive the expression for frequency of oscillation. 10 Marks
b) In a RC phase shift oscillator, if its frequency of operation is 955 Hz and R1=R2= R3 =680 K ohms, find the value of capacitor. 4 Marks

UNIT-V

9 a) Explain the difference between UJT and a Conventional BJT. 7 Marks
b) Explain the VI characteristics of UJT. 7 Marks

(OR)

10 Explain the principle of operation and characteristics of Varactor diode. 14 Marks

❀ ❀ ❀

CODE No.: 16BT20541 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations, December-2022

FOUNDATIONS OF DATA STRUCTURES

[Electrical and Electronics Engineering, Electronics and Communication Engineering and Electronics and Instrumentation Engineering]

Max. Marks: 70

Time: 3 hours

Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1	a)	Illustrate a non recursive, in-place version of the quick-sort algorithm. The algorithm should still be based on the same divide-and-conquer approach, but use an explicit stack to process sub problems.	7 Marks
	b)	What is divide and conquer strategy? State three steps of Merge sort.	7 Marks
		(OR)	
2		Explain the divide and conquer methodology. Suggest a pseudo code for merge sort and analyze its complexities. Trace algorithm on the data <8, 4, 1, 6, 7, 2, 3, 9>.	14 Marks

UNIT-II

3	a)	Find infix and postfix expressions for the following prefix expression and explain the steps in detail. *-AB+*CD/EF.	7 Marks
	b)	Explain the implementation of circular queue using array. How an "empty queue" is distinguished from a "full queue"? Write necessary functions to perform all valid operations on circular queue.	7 Marks
		(OR)	
4	a)	Enumerate and describe briefly the various applications of Stacks and Queues.	5 Marks
	b)	Explain the terms infix expression, prefix expression, and postfix expression. Convert the following infix expression to their postfix equivalents: 14 / 7 * 3 - 4 + 9 / 2.	5 Marks

UNIT-III

5	a)	Write routines to implement the operations INSERT, DELETE, and SEARCH for circular linked lists.	7 Marks
	b)	Write the insert ( ) and find ( ) routines for Single Linked List.	7 Marks
		(OR)	
6	a)	Write the delete () routines for Single Linked List and Circular Linked List.	7 Marks
	b)	Form a linked list to store student's details. Give the advantages and uses of a circular linked list.	7 Marks

UNIT-IV

7		Show the result of inserting <3, 1, 4, 6, 9, 2, 5, 7> into an initially empty binary search tree. Show the result of deleting the root. Explain the different tree traversals for the resultant tree by giving algorithms and running times.	14 Marks
		(OR)	
8	a)	Insert into an empty AVL tree with keys 30, 40, 24, 58, 48, 26, 11, 13. Draw the tree after each insertion.	7 Marks
	b)	Insert the keys 90, 20, 70, 11, 16, 15, 1 into the empty Binary Search Tree in this order. Draw the tree once after the keys 11 is inserted, then again after 1 is inserted.	7 Marks

UNIT-V

9	a)	Given an adjacency-list representation of a directed graph, how long does it take to compute the out-degree of every vertex? How long does it take to compute the in-degrees?	7 Marks
	b)	What is the significance of Hashing over linear and binary search?	7 Marks

(OR)

10	a)	Give adjacency list and adjacency matrix representations for a full binary search tree formed by inserting the elements <3, 1, 5, 2, 0, 4, 6>. Can a tree can be Graph?	7 Marks
	b)	Write a program to find the topological order of a digraph G represented as adjacency lists. If a stack is used instead of a queue, does a different ordering result? Illustrate with an example.	7 Marks

CODE No.: 16BT21201 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations, December 2022

OBJECT ORIENTED PROGRAMMING THROUGH C++

[Computer Science and Engineering, Information Technology and Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Discuss the idea of message passing with objects.	14 Marks
		(OR)	
2		Explain the features of reference variables.	14 Marks

UNIT-II

3	a)	What is an inline function? What are the advantages of having a function inline?	8 Marks
	b)	Write a C++ program to find cube of a number using inline function.	6 Marks
		(OR)	
4		Write a function using reference variables as arguments to swap the values of a pair of integers.	14 Marks

UNIT-III

5		Define sorting. Implement Bubble sort algorithm using arrays.	14 Marks
		(OR)	
6	a)	Define Pointer. How is the Reference operator helpful in a program?	7 Marks
	b)	Explain the purpose of Dereference operator with a suitable example?	7 Marks

UNIT-IV

7	a)	What is function overriding? Explain with an example?	5 Marks
	b)	What is operator overloading? Write a C++ program to compare two values representing distance in feet and inches, using overloading operator >.	9 Marks
		(OR)	
8		Write a C++ program to add and multiply two complex numbers. Initialize the variables through writing constructor. Implement add and multiply operations using overloaded + and * operators.	14 Marks

UNIT-V

9		What are the steps involved in using a file in a C++ program.	14 Marks
		(OR)	
10		Explain about container classes in C++, with a suitable example.	14 Marks

CODE No.: 16BT21501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations, December-2022

DIGITAL LOGIC DESIGN

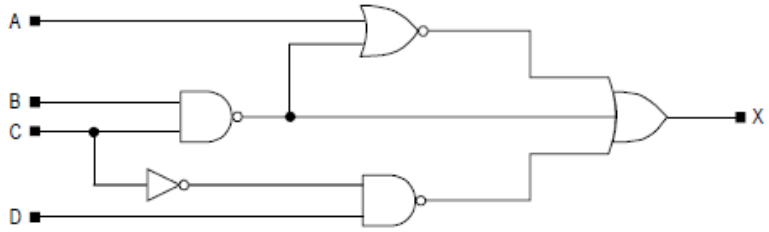
[Computer Science and Engineering, Information Technology and Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1 a) Write the logic expression and simplify it as much as possible and draw a logic diagram that implements the simplified expression. 8 Marks



b) Represent the given decimal number 8620 in BCD code, Excess-3 code and as a binary number. 6 Marks

(OR)

2 a) Verify that the following operations are commutative and associative 6 Marks
i) AND ii) EX-OR

b) Most calculators use BCD to store the decimal values as they are entered into the keyboard and to drive the digit displays. 8 Marks
i) If a calculator is designed to handle 8 – digit decimal numbers, how many bits does this require?
ii) What bits are stored when the number 375 is entered into the calculator?

UNIT-II

3 a) Draw a logic diagram using only two-input NAND gates to implement the following expression: 7 Marks
$F = (AB + A'B)(CD' + C'D)$

b) Implement the following Boolean function F together with the don't care conditions d using no more than two NOR gates. Assume that both the normal and complement inputs are available. 7 Marks
$F(A,B,C,D) = \Sigma m(0,1,2,9,11)$
$d(A, B, C, D) = \Sigma(8,10,14,15)$

(OR)

4 a) Realize EX-NOR using minimum number of NOR gates. 7 Marks

b) Draw a NAND logic diagram that implements the complement of the following function: $F(A, B, C, D) = \Sigma(0,1,2,3,4,8,9,12)$. 7 Marks

UNIT-III

5 a) Implement the following function with 8×1 multiplexer 6 Marks
$F(A, B, C, D) = \Sigma m\ (0, 1, 3, 4, 8, 9, 15)$

b) Design a combinational circuit, that multiplies an input decimal digit represented in BCD by 5. The output is to be represented in BCD. Show that the outputs can be obtained from the input lines without using any logic gates. 8 Marks

(OR)

6	a)	A combinational circuit is specified by the following three Boolean functions: $F_1 = \Sigma m(0, 3, 4)$; $F_2 = \Sigma m(1, 2, 7)$; $F_3 = \Pi M(0, 1, 2, 4)$ Implement the circuit with a decoder and external OR gates.	8 Marks
	b)	Draw the circuit of 1×4 demultiplexer using NAND gates.	6 Marks

UNIT-IV

7	a)	Design a mod-8 ripple counter using positive edge triggered JK flip-flops.	7 Marks
	b)	Illustrate the operation of 3 bit Ring counter and plot the output waveforms.	7 Marks
		(OR)	
8	a)	Design a Mod 5 synchronous counter using JK flip-flops.	8 Marks
	b)	The contents of a serial-in/serial-out shift register are DCBA = 0101, where A is the least significant digit of the register. A serial input 10011 is moved into the shift register, from left to right, most significant bit first, by five successive clock pulses. Draw time diagrams showing how the outputs of the four flip-flops vary with time during the period of the five clock pulses.	6 Marks

UNIT-V

9		Design an Excess-3 to BCD code converter using PLA.	14 Marks
		(OR)	
10	a)	Realize the following functions using PROM of size 8×3. $F_1 = \Sigma m(0, 4, 7)$; $F_2 = \Sigma m(1, 3, 6)$; $F_3 = \Sigma m(1, 2, 4, 6)$	8 Marks
	b)	Explain ROM organization.	6 Marks

CODE No.: 19BT1BS02 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

BIOLOGY FOR ENGINEERS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		What is a living organism? What are the differences between prokaryotes and eukaryotes?	12 Marks	L1	CO1	PO1
		(OR)				
2.	a)	How living organisms obtain energy from their carbon sources? Classify them.	6 Marks	L2	CO1	PO1
	b)	Explain the cellular basis of life.	6 Marks	L2	CO1	PO1

UNIT-II

3.		What is bio-molecule? Enlist the classification of carbohydrates, proteins and Nucleic acids.	12 Marks	L1	CO1	PO1
		(OR)				
4.	a)	Define Enzyme. Summarize the industrial applications of bacterial enzymes.	8 Marks	L1	CO1	PO5
	b)	What are nucleic acids in biology?	4 Marks	L2	CO1	PO1

UNIT-III

5.		Explain about Mendelian Laws of inheritance. What is genetic code and how is it read?	12 Marks	L2	CO2	PO1
		(OR)				
6.		What are Replication, Transcription and Translation? Explain with diagrams.	12 Marks	L2	CO2	PO1

UNIT-IV

7.		What is the role of Recombinant DNA technology in transgenic microbes and plants? Explain with examples.	12 Marks	L2	CO3	PO6
		(OR)				
8.	a)	What is Biosensor and Biochip? How does it work?	6 Marks	L3	CO3	PO1
	b)	What are the advantages of recombinant vaccines and how they are made?	6 Marks	L4	CO3	PO6

UNIT-V

9.	a)	What is the purpose of a microarray? Give an example of a real world application of microarray analysis?	6 Marks	L1	CO3	PO1
	b)	How do neurons know which neurotransmitter to release? Explain.	6 Marks	L2	CO1	PO1
		(OR)				
10.		How would you describe the human digestive system? Give a detailed diagram.	12 Marks	L1	CO1	PO1

CODE No.: 19BT1BS03 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations, December 2022

ENGINEERING PHYSICS

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	What are Newton's rings? Describe and explain the formation of Newton's rings. Derive the expression for the wavelength of monochromatic light.	10 Marks	L2	CO1	PO1
	b)	A soap film of refractive index 1.33 and thickness 5000 Å is exposed to white light. What wavelength in the visible region is reflected?	2 Marks	L1	CO1	PO2
		(OR)				
2.	a)	Describe the construction and working of Nicol's prism.	7 Marks	L2	CO1	PO1
	b)	Explain the theory of plane transmission grating.	5 Marks	L2	CO1	PO1
		UNIT-II				
3.		Write Maxwell equations. Discuss the equation of electromagnetic wave in dielectric medium and hence evaluate the velocity of light in free space.	12 Marks	L2	CO2	PO1 PO2
		(OR)				
4.	a)	Define the acceptance angle and numerical aperture. Derive an expression for the numerical aperture of an optical fiber.	9 Marks	L3	CO2	PO2
	b)	Calculate the angle of acceptance of given optical fiber, if the refractive indices of the core and the cladding are 1.563 and 1.498 respectively.	3 Marks	L3	CO2	PO2
		UNIT-III				
5.	a)	Derive an expression for the electron concentration in an intrinsic semiconductor.	9 Marks	L3	CO3	PO1 PO2
	b)	Find the diffusion coefficient of electron in silicon at 300K, if μ_e is 0.19 $m^2/V\text{-}s$.	3 Marks	L1	CO3	PO2
		(OR)				
6.	a)	State and explain the Hall effect. Obtain an expression for the Hall coefficient of a given semiconductor specimen.	9 Marks	L2	CO3	PO1
	b)	The Hall coefficient of a specimen is 3.66×10^{-4} m^3C^{-1}. Its resistivity is 8.93×10^{-3} Ω-m, find carrier density.	3 Marks	L1	CO3	PO2
		UNIT-IV				
7.	a)	Describe the frequency dependence of polarization.	7 Marks	L2	CO4	PO1
	b)	What is piezoelectricity? List its applications.	5 Marks	L1	CO4	PO1
		(OR)				
8.	a)	Summarize the ferromagnetic hysteresis loop.	6 Marks	L2	CO4	PO1
	b)	Distinguish soft and hard magnetic material. Explain their properties.	6 Marks	L4	CO4	PO1
		UNIT-V				
9.	a)	Illustrate the AC and DC Josephson effect.	6 Marks	L2	CO5	PO1
	b)	Describe the BCS theory of Super conductivity.	6 Marks	L2	CO5	PO1
		(OR)				
10.	a)	List out applications of nanomaterial's.	4 Marks	L1	CO5	PO1
	b)	Explain the synthesis of nanomaterial's using PLD method.	8 Marks	L2	CO5	PO1

❀ ❀ ❀

CODE No.: 19BT2BS01 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

TRANSFORMATION TECHNIQUES AND LINEAR ALGEBRA

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Express $f(x)$ as a Fourier series in (-2,2) — 6 Marks — L3 — CO1 — PO1

If $f(x) = \begin{cases} 2, & if \ -2 < x < 0 \\ 0, & if \ \ 0 < x < 2 \end{cases}$

b) Establish Fourier sine transform for the function $\frac{e^{-ax}}{x}$. — 6 Marks — L1 — CO1 — PO2

(OR)

2. a) Using Fourier integral, Show that — 4 Marks — L3 — CO1 — PO2

$$e^{-ax} - e^{-bx} = \frac{2(b^2 - a^2)}{\pi} \int_0^\infty \frac{\lambda \sin \lambda x}{(\lambda^2 + a^2)(\lambda^2 + b^2)} d\lambda .$$

b) Show that the Fourier cosine transform of — 8 Marks — L1 — CO1 — PO1

$$f(x) = \begin{cases} x, & for \ 0 < x < 1 \\ 2 - x, & for \ 1 < x < 2 \\ 0, & for \ x > 2 \end{cases} \quad is \ \frac{2}{p^2} \cos p (1 - \cos p).$$

UNIT-II

3. a) Determine $L\left\{\frac{1 - \cos at}{t}\right\}$. — 6 Marks — L3 — CO1 — PO1

b) Find the Laplace transform of $e^{-3t} \int_0^t \frac{\sin t}{t} dt$. — 6 Marks — L1 — CO1 — PO2

(OR)

4. a) Find the Laplace transform of the square wave function defined by — 6 Marks — L1 — CO1 — PO1

$$f(t) = \begin{cases} 1, & if \ 0 < t < a \\ 1, & if \ \frac{a}{2} < t < a \end{cases} \text{ with period } a .$$

b) Using Laplace transform, Show that $\int_0^\infty t^2 e^{-4t} \sin 2t \, dt = \frac{11}{500}$. — 6 Marks — L3 — CO1 — PO2

UNIT-III

5.	a)	Find the inverse Laplace transform of $\log\left(\frac{1+s}{s^2}\right)$.	6 Marks	L1	CO1	PO1
	b)	Apply convolution theorem to evaluate $L^{-1}\left[\frac{s}{(s^2+1)^2}\right]$.	6 Marks	L3	CO1	PO2
		(OR)				
6.		Using Laplace transform, solve the differential equation $(D^2 + n^2)\,y = a \sin(nt + 2)$, *given that* $y(0) = 0,\ y'(0) = 0$.	12 Marks	L3	CO1	PO2

UNIT-IV

7.		Determine the Eigen values and corresponding Eigen vectors of the matrix $A = \begin{bmatrix} 2 & 2 & 0 \\ 2 & 5 & 0 \\ 0 & 0 & 3 \end{bmatrix}$.	12 Marks	L3	CO2	PO1
		(OR)				
8.	a)	Find the rank of matrix $A = \begin{bmatrix} 8 & 1 & 3 & 6 \\ 0 & 3 & 2 & 2 \\ -8 & -1 & -3 & 4 \end{bmatrix}$ by reducing it to echelon form.	6 Marks	L1	CO2	PO1
	b)	Find the orthogonal transformation which transforms the quadratic form $2x^2 + 2y^2 + 2z^2 - 2xy - 2yz - 2zx$ to the canonical form**.**	6 Marks	L1	CO2	PO2

UNIT-V

9.	a)	Examine whether the set of vectors $\begin{bmatrix} 1 \\ 1 \\ 0 \end{bmatrix}, \begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix}$ *and* $\begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix}$ is linearly independent or not.	6 Marks	L4	CO2	PO2
	b)	Show that the transformation $T: R^2 \to R^3$ defined by $T\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} x \\ 2x - y \\ 3x + 4y \end{bmatrix}$ is linear.	6 Marks	L2	CO2	PO1
		(OR)				
10.	a)	Show that the vectors $\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}, \begin{bmatrix} -1 \\ 0 \\ 1 \end{bmatrix}$ *and* $\begin{bmatrix} 4 \\ 9 \\ 7 \end{bmatrix}$ form a basis of $R^3(R)$.	6 Marks	L2	CO2	PO1
	b)	Show that the linear transformation $T: R^2 \to P_1$ defined by $T\begin{bmatrix} a \\ b \end{bmatrix} = a + (a + b)x$ is one-to-one and onto, where P_1 is a vector space of all linear polynomial over real field.	6 Marks	L2	CO2	PO2

CODE No.: 19BT10501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations, December 2022

PROGRAMMING FOR PROBLEM SOLVING

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Describe the efficiency of algorithms with suitable examples.	6 Marks	L2	CO1	PO1
	b)	List and explain about the data types in Python.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Write a short notes on : i) Implicit line joining ii) Explicit line joining	6 Marks	L1	CO1	PO1
	b)	Define variable. Explain identifier rules.	6 Marks	L1	CO1	PO1

UNIT-II

3.	a)	Write a python script to find whether the given number is perfect number or deficient number or abundant number.	6 Marks	L3	CO1	PO2
	b)	Display the following pattern using Python script. 11111 1111 111 11 1	6 Marks	L3	CO1	PO2
		(OR)				
4.	a)	Write a python script to print list of prime numbers within a range.	6 Marks	L3	CO1	PO2
	b)	Specify the usage of pass, break and continue statements.	6 Marks	L2	CO1	PO1

UNIT-III

5.	a)	Compose a Python script to perform matrix multiplication.	6 Marks	L3	CO1	PO2
	b)	Write a Python script to count the number of vowels, consonants and so on Expected Output: Enter a line of string: adfslkj34 34lkj34334lk Vowels: 1 Consonants: 11 Digits: 9 White spaces: 1	6 Marks	L3	CO1	PO3
		(OR)				
6.	a)	Write a python script to search a key element in the given list of elements.	6 Marks	L3	CO1	PO2
	b)	Illustrate any four set operation functions with an example program.	6 Marks	L2	CO1	PO1

UNIT-IV

7.	a)	Discuss in detail about return statement in python with an example.	6 Marks	L2	CO2	PO1
	b)	Develop a python script to copy data from one file to another file.	6 Marks	L3	CO2	PO2
		(OR)				
8.	a)	Differentiate global keyword and globals() function with an example.	6 Marks	L2	CO2	PO1
	b)	List and explain any four built-in functions in numpy.	6 Marks	L1	CO2	PO1

UNIT-V

9.	a)	Discuss in detail about how to read data from CSV files.	6 Marks	L3	CO2	PO2
	b)	List the steps to create data frame from dictionary with an example.	6 Marks	L3	CO2	PO2
		(OR)				
10.	a)	Consider data frame contains student marks information. Write a Python script to display student details whose marks <60.	6 Marks	L3	CO2	PO3
	b)	Write a Python script to print information and frequency counts of a data set.	6 Marks	L3	CO2	PO2

CODE No.: 19BT20101 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations, December-2022

CIVIL ENGINEERING MATERIALS AND CONCRETE TECHNOLOGY

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Briefly explain the geological classification of rocks.	6 Marks	L2	CO1	PO1
	b)	Mention the factors to be considered while deciding a quarry site.	6 Marks	L1	CO1	PO1 PO8
		(OR)				
2.	a)	Illustrate the various methods used in manufacturing of bricks.	6 Marks	L2	CO1	PO1
	b)	Discuss briefly about the types of tiles.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	List and explain the various methods of seasoning of timber.	6 Marks	L2	CO1	PO1 PO2 PO5
	b)	Discuss the various materials used in low cost housing.	6 Marks	L2	CO1	PO1 PO2
		(OR)				
4.	a)	Enumerate the precautionary measures to reduce various defects in timber.	6 Marks	L4	CO1	PO1 PO2
	b)	Write advantages and disadvantages, if waste is used as alternative building material.	6 Marks	L2	CO1	PO1 PO2 PO4
		UNIT-III				
5.	a)	Mention different types of tests on cement. Explain how to conduct normal consistency test on cement.	6 Marks	L3	CO1	PO1 PO2
	b)	List out various types chemical admixtures. How these admixtures are supporting to the environment.	6 Marks	L4	CO1	PO1
		(OR)				
6.	a)	Briefly describe the following tests on aggregates: i) Crushing test ii) Impact test	6 Marks	L4	CO1	PO1
	b)	Write about plasticizers and super plasticizers.	6 Marks	L3	CO1	PO1
		UNIT-IV				
7.	a)	Explain how the measurement of workability of fresh concrete is carried out in laboratory.	6 Marks	L4	CO1	PO1 PO2
	b)	Distinguish Segregation and Bleeding in concrete in detail.	6 Marks	L2	CO1	PO1
		(OR)				
8.	a)	Why compaction is required to concrete? Explain compaction methods by vibration.	6 Marks	L4	CO1	PO1 PO2
	b)	Explain how you estimate the quality of concrete by using ultrasonic pulse velocity test.	6 Marks	L4	CO1	PO1 PO2

UNIT-V

9.	a)	Explain the various factors affecting creep of concrete.	6 Marks	L2	CO1	PO1 PO2
	b)	Explain the determination of the modulus of elasticity of concrete experimentally.	6 Marks	L4	CO1	PO1 PO2 PO4
		(OR)				
10.		Design a M30 concrete mix using IS method of mix design for the following data: i) Maximum size of aggregate: 20 mm (Angular) ii) Workability: 125 mm slump. iii) Quality control: good iv) Type of exposure - Mild (R.C.C) v) Specific Gravity: a) Cement:3.15 b) Sand:2.63 c) CA: 2.66 vi) Water absorption: a) CA - 0.5% b) FA - 1.0% vii) Free surface moisture: a)CA - Nil b) FA - 2.2% viii) Sand confirms to Zone III grading Assume any other data required suitably.	12 Marks	L6	CO2	PO1 PO2 PO3 PO8

CODE No.: 19BT20102 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations, December - 2022

ENGINEERING MECHANICS

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Two forces of magnitude P and Q act at a point. Their resultant is inclined to first, at an angle α and has magnitude R. If the magnitude of the first force is increased by R, determine the angle made by the new resultant with the first force.	6 Marks	L4	CO1	PO1 PO2
	b)	Two forces of magnitude (P+Q) and (P-Q) acting at a point include an angle 2θ. Show that, if their resultant makes an angle α with the bisector of the angle between them, then P tan α = Q tan θ.	6 Marks	L4	CO1	PO1 PO2

(OR)

2.	a)	Define: i) Moment of a force and ii) Couple.	6 Marks	L4	CO1	PO1 PO2
	b)	Determine and locate the resultant R of the forces and one couple acting on the beam as shown in Fig.1.	6 Marks	L4	CO1	PO1 PO2

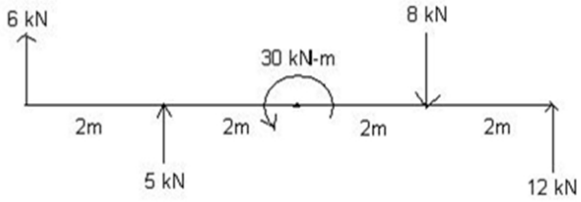


Fig.1

UNIT-II

3.	a)	What is friction? Explain how friction is both desirable and undesirable in engineering applications also state the laws of static and dynamic friction.	6 Marks	L4	CO1	PO1 PO2
	b)	A body of weight 50N is placed on a rough horizontal plane. To just move the body on the horizontal plane, a push of 15N inclined at 30° to the horizontal plane is required. Find the coefficient of friction.	6 Marks	L4	CO1	PO1 PO2

(OR)

4.	a)	What is friction? Explain how friction is both desirable and undesirable in engineering applications also state the laws of static and dynamic friction.	6 Marks	L4	CO1	PO1 PO2

	b)	A body of weight 50N is placed on a rough horizontal plane. To just move the body on the horizontal plane, a push of 15N inclined at 30° to the horizontal plane is required. Find the coefficient of friction.	6 Marks	L4	CO1	PO1 PO2

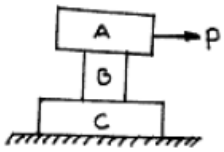


Fig.2

UNIT-III

5.		Find the moment of inertia of the plane area shown in Fig.3. about X and Y axes through its centroid.	12 Marks	L4	CO1	PO1 PO2

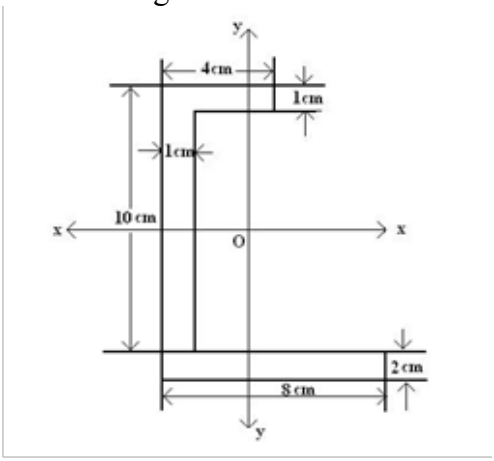


Fig.3

(OR)

6.	a)	State and prove theorems of Pappus–Guldinus.	6 Marks	L4	CO1	PO1 PO2
	b)	Find the centroid of the inverted T section shown in below Fig.4.	6 Marks	L4	CO1	PO1 PO2

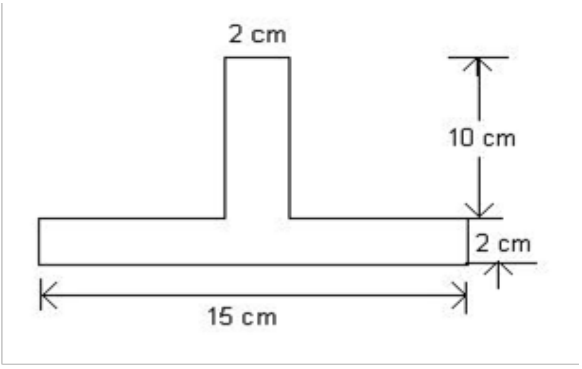


Fig.4

UNIT-IV

7.		A compound bar consist of a central steel strip 25 mm wide and 6.4 mm thick placed between two strips of brass each 25 mm wide and 't' mm thick. The strips are firmly fixed together to form a compound bar of rectangular section 20 mm wide and (2t + 6.4) mm thick. Determine i) The thickness of the brass strips which will make the apparent modulus of elasticity of compound bar $1.57x10^5$ N/mm^2 and ii) the maximum axial pull the bar can then carry if the stress is not to exceed 157 N/mm^2, in either the brass or steel. Take the values of E for steel and brass as $2.07x10^5$ N/mm^2 and $1.14x10^5$ N/mm^2 respectively.	12 Marks	L4	CO1	PO1 PO2
		(OR)				
8.	a)	Derive the expression for the extension of a bar due to its self-weight.	6 Marks	L4	CO1	PO1 PO2
	b)	A rod of steel is 20 m long at a temperature of 20°C. Find the free expansion of the rod when the temperature rises to 65°C. Find the temperature stress produced i) When the expansion of the rod is prevented ii) When the rod is permitted to expand by 5.8 mm. Take $\alpha = 12x10^{-6}$ per°C and E=$2x10^5$ N/mm^2	6 Marks	L4	CO1	PO1 PO2

UNIT-V

9.	a)	A cylindrical water tank of height 25 m, inside diameter 2.2 m, having vertical axis is open at the top. The tank is made up of steel having yield stress of 210 MN/m^2. Determine the thickness of shell used when the tank is full of water.	6 Marks	L6	CO2	PO1 PO2 PO3
	b)	A cylindrical air drum is 2.25 m in diameter with plates 1.2 cm thick. The efficiencies of the longitudinal and circumferential joints are respectively 75 % and 40 %. If the tensile stress in the plating is to be limited to 120 MN/m^2, find the maximum safe air pressure.	6 Marks	L4	CO1	PO1 PO2
		(OR)				
10.		Mention the assumptions in Lame's theory. Derive Lame's equation for radial and circumferential stress of thick cylinder.	12 Marks	L4	CO1	PO1 PO2

CODE No.: 19BT20201 SVEC-19

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations, December-2022

ELECTRIC CIRCUITS

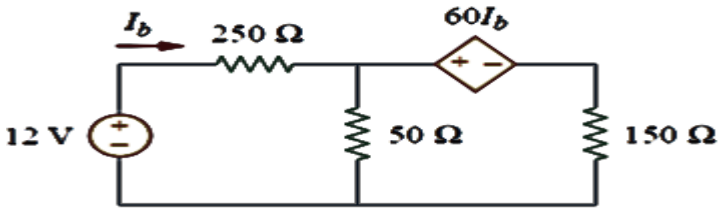
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

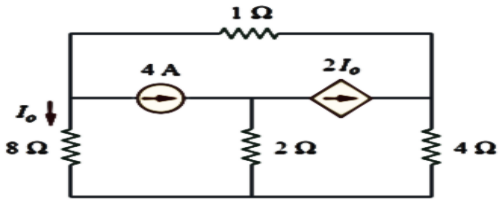
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Determine I_b of the circuit shown in figure using mesh analysis. 6 Marks L4 CO1 PO2

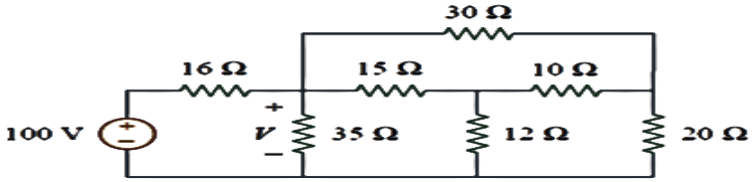


b) Obtain I_0 of the circuit shown in figure. 6 Marks L4 CO1 PO2

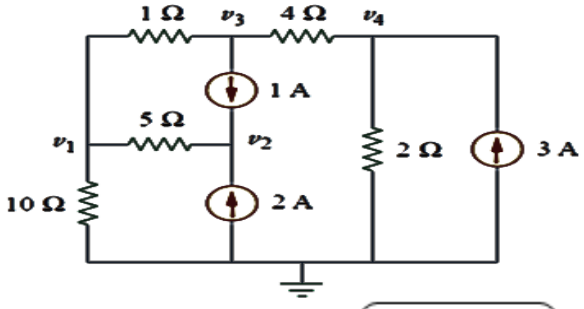


(OR)

2. a) Find the V of the circuit shown in figure. 6 Marks L3 CO1 PO2

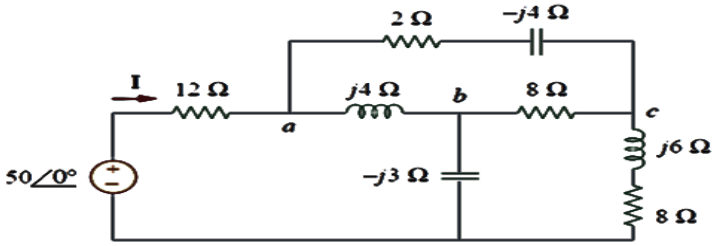


b) Determine the nodal voltages of the circuit shown in figure. 6 Marks L3 CO1 PO2



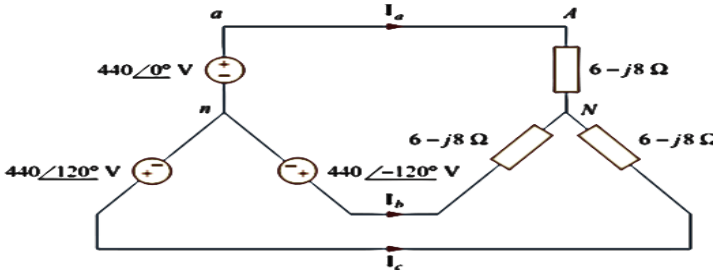
UNIT-II

3. Find total impedance and total power supplied by the source of the circuit shown in figure. 12 Marks L4 CO1 PO2



(OR)

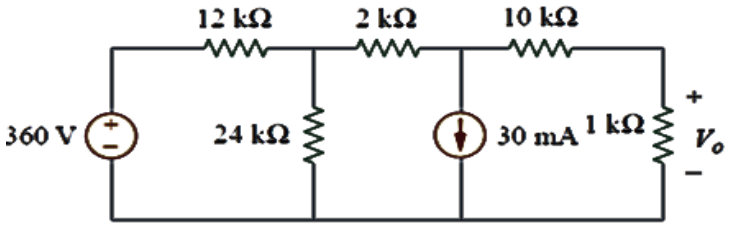
4.	a)	Obtain the line currents in the three-phase circuit shown in figure.	6 Marks	L3	CO1	PO2



	b)	In two wattmeter method the reactive power input is 15 kVAR and P.f. is 0.8 lag. Calculate the total input power of three phase balanced load and each wattmeter reading.	6 Marks	L3	CO1	PO2

UNIT-III

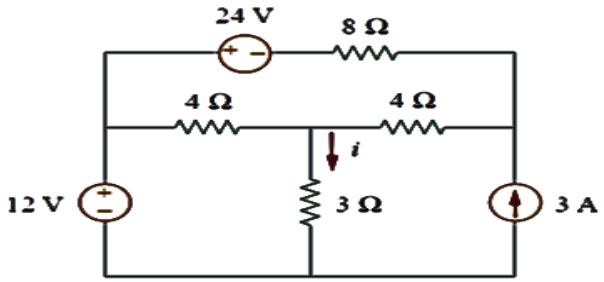
5.	a)	Use Norton's theorem to find V_0 in the circuit shown in figure.	6 Marks	L3	CO1	PO5



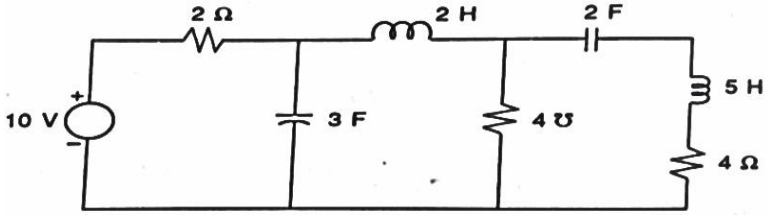
	b)	State and explain Maximum power transfer theorem and derive the necessary conditions for maximum power transfer for AC excitations.	6 Marks	L2	CO1	PO1

(OR)

6.	a)	Find current *i* of the circuit shown in figure using superposition theorem.	6 Marks	L3	CO1	PO5



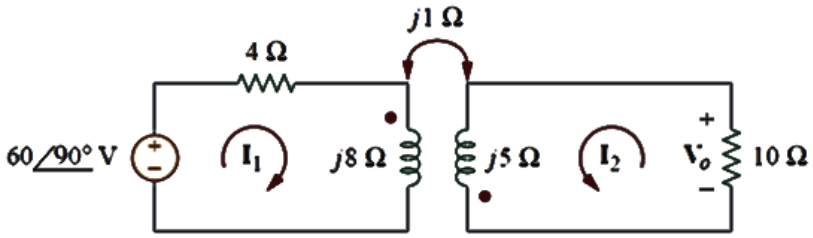
	b)	Construct the dual circuit of the network shown in figure. Mention the procedural steps.	6 Marks	L3	CO1	PO5



UNIT-IV

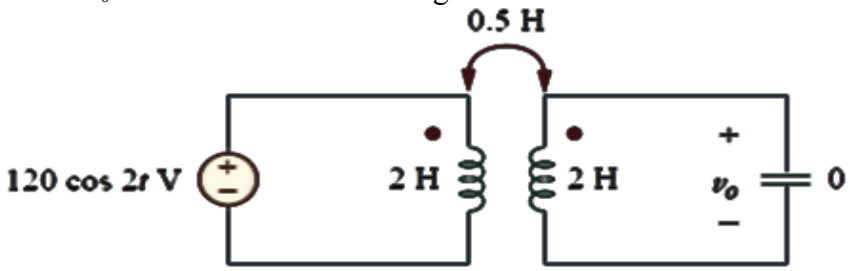
7.	a)	Two coils connected in series-aiding fashion have a total inductance of 250 mH. When connected in a series-opposing configuration, the coils have a total inductance of 150 mH. If the inductance of one coil is three times the other, find self inductances and mutual inductance. What is the coupling coefficient?	6 Marks	L2	CO1	PO1

	b)	Determine the mesh currents of the circuit shown in figure.	6 Marks	L4	CO1	PO2

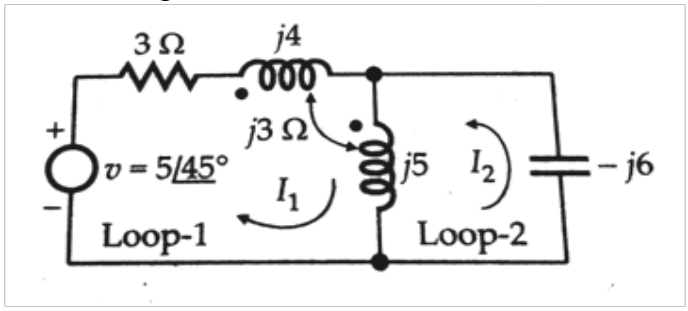


(OR)

8.	a)	Obtain v_0 of the circuit shown in figure.	6 Marks	L4	CO1	PO2



	b)	Find the voltage drop across the capacitor and resistor in the circuit shown in figure.	6 Marks	L4	CO1	PO2



UNIT-V

9.	a)	Define characteristic impedance and derive the characteristic impedance for a *T* and π networks. Also explain the nature of characteristic impedance in pass band and stop bands.	6 Marks	L2	CO1	PO1
	b)	Design a constant- *k* high pass filter to have a cut-off frequency of 2 kHz and a design impedance of 100 Ohms.	6 Marks	L4	CO2	PO3

(OR)

10	a)	Derive the expression for design impedance of a constant-*k* filters	6 Marks	L3	CO1	PO1
.	b)	Design a constant-*k* low pass filter having cut off frequency of 2.5 kHz and design resistance of R_0= 700 Ohms. Also find the frequency at which the filter produces an attenuation of 19.1 dB.	6 Marks	L4	CO2	PO3

CODE No.: 19BT20241 SVEC-19

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations, December-2022

NETWORK ANALYSIS

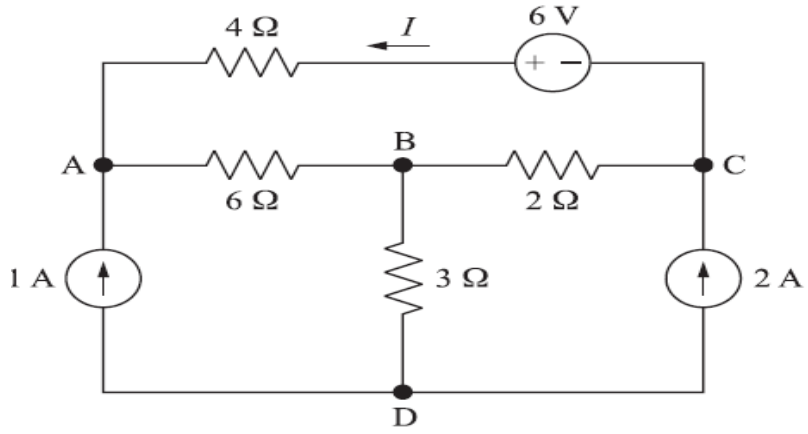
[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

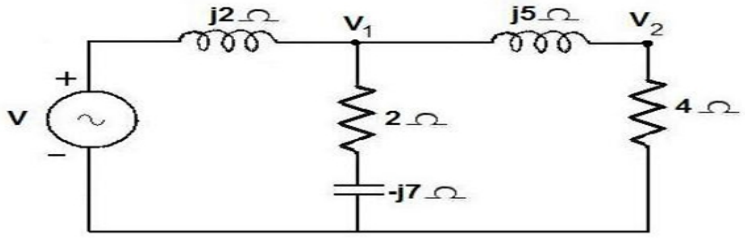
UNIT-I

1.	a)	State Kirchhoff's voltage and current laws.	4 Marks	L1	CO1	PO1
	b)	In the circuit shown in figure, write three node equations for nodes A, B, and C, with node D as the reference, and find the node voltages.	8 Marks	L4	CO1	PO2

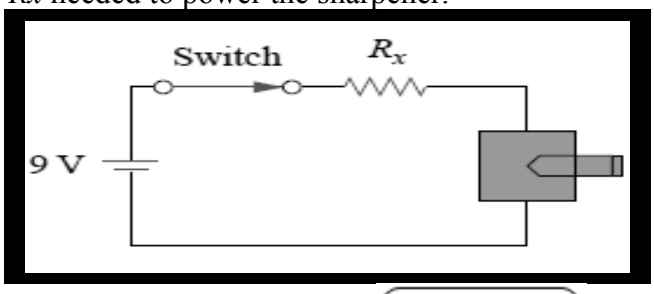


(OR)

2.	a)	Solve for V_1 and V_2 using nodal method. Let V = 100V.	6 Marks	L4	CO1	PO2



	b)	An electric pencil sharpener rated 240 mW, 6 V is connected to a 9-V battery as shown in figure, design the series dropping resistor *Rx* needed to power the sharpener.	6 Marks	L3	CO2	PO3



UNIT-II

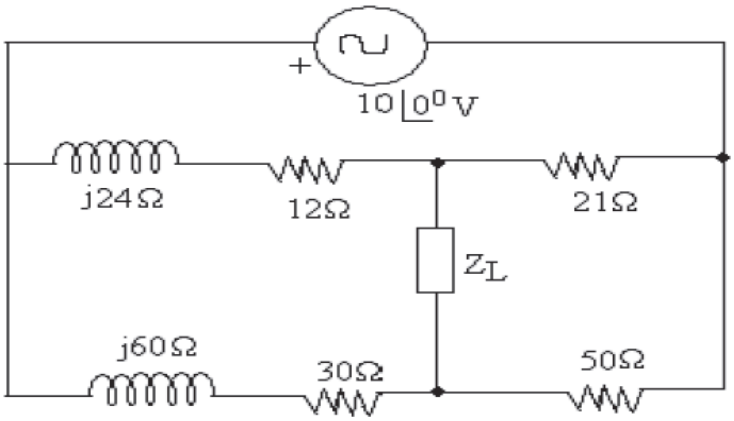
3.	a)	Explain the concept of active, reactive and apparent power and draw the power triangle.	4 Marks	L1	CO1	PO1
	b)	In a TV transmitter, a series circuit has an impedance of 3 k *Ohms* and a total current of 50 mA. If the voltage across the resistor is 80 V, what is the power factor of the circuit?	8 Marks	L3	CO2	PO6

(OR)

4.	a)	Bring out the differences between series and parallel resonance?	4 Marks	L2	CO1	PO1
	b)	A series RLC circuit has R=20 ohm, L=0.005H and C = 0.2 x 10^{-6} F. It is fed from a 100V variable frequency source. Find i) frequency at which current is maximum ii) impedance at this frequency and iii) voltage across inductance at this frequency.	8 Marks	L4	CO1	PO2

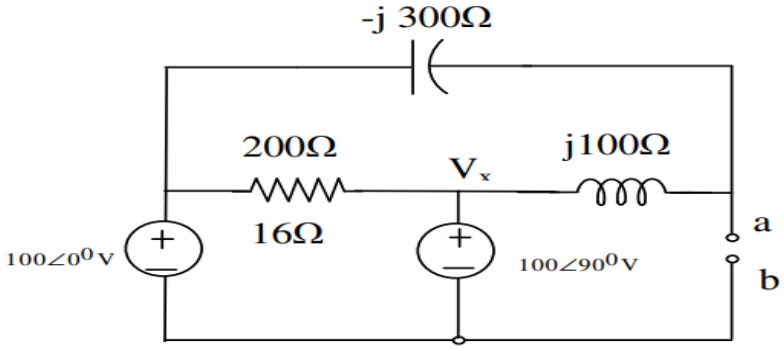
UNIT-III

5.	a)	State and explain the Norton's theorem.	4 Marks	L1	CO1	PO1
	b)	In the network shown in figure, find the value of Z_L so that the power transfer from the source is maximum. Also find P_{max}.	8 Marks	L4	CO1	PO2



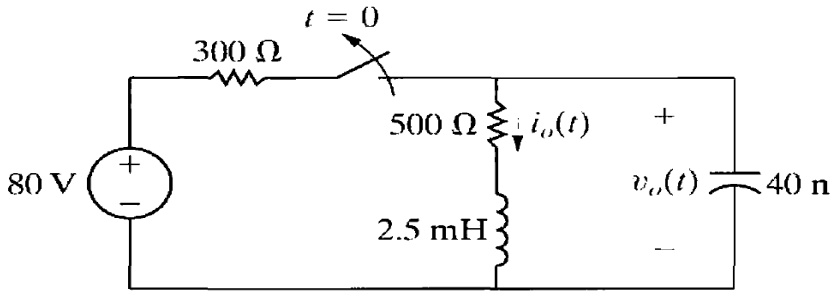
(OR)

6.	a)	State and explain Maximum power transfer theorem and derive the necessary conditions for maximum power transfer for AC excitations.	6 Marks	L2	CO1	PO2
	b)	Find the Thevenin equivalent circuit for the circuit shown below Figure.	6 Marks	L3	CO1	PO5



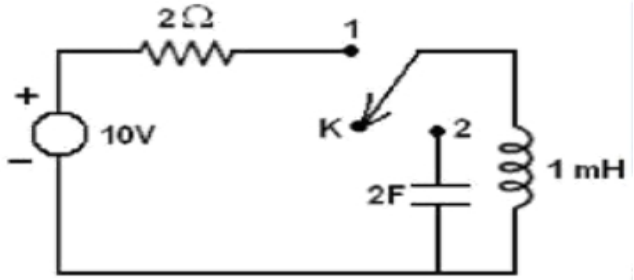
UNIT-IV

7.	a)	Explain the steady state and transient behavior of an inductor.	4 Marks	L1	CO1	PO1
	b)	The switch in the circuit shown in figure has been closed for a long time. The switch opens at t = 0, find $v_0(t)$ and $i_0(t)$ for t>0.	8 Marks	L4	CO2	PO2



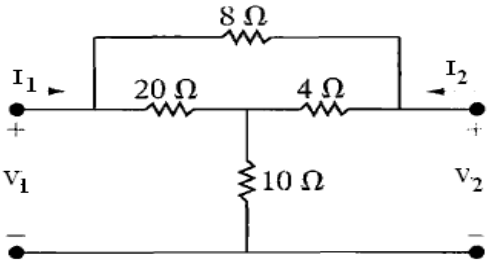
(OR)

8.	a)	Derive the transient response of series R-L-C circuit, with DC excitation using Laplace transform obtain the response for an under damped case.	4 Marks	L3	CO1	PO5
	b)	For the circuit given in figure steady state conditions are reached for the switch K in position '1'. At t = 0, the switch is changed to position 2. Use the time domain method to determine the current through the inductor for all t>0.	8 Marks	L4	CO1	PO2



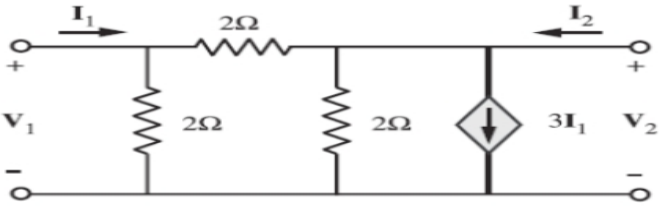
UNIT-V

9.	a)	Y-parameters for a two port network are given as Y_{11}=0.75, Y_{12}=Y_{21}=-0.25, Y_{22}=0.8. Determine the hybrid parameters.	6 Marks	L2	CO1	PO2
	b)	Find the y- Parameters for the circuit shown in the figure.	6 Marks	L4	CO2	PO4



(OR)

10.	a)	Y-parameters for a two port network are given as Y_{11}=0.75, Y_{12}=Y_{21}=-0.25, Y_{22}=0.8. Design an equivalent π-network.	6 Marks	L3	CO2	PO3
	b)	Determin the impedance parameters for the network shown in figure. Invistigate whether the netwok is symmetrical and reciprocal.	6 Marks	L4	CO1	PO2



❀ ❀ ❀

CODE No.: 19BT20301 SVEC-19

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

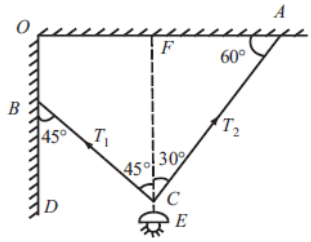
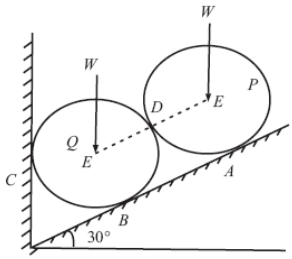
I B.Tech II Semester (SVEC-19) Supplementary Examinations, December-2022

BASIC ENGINEERING MECHANICS
[Mechanical Engineering]

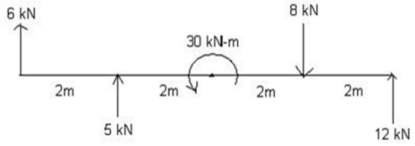
Time: 3 hours **Max. Marks: 60**

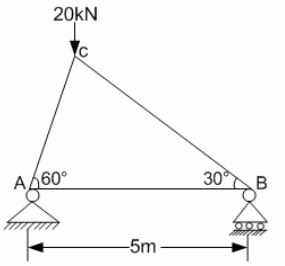
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	An Electric light fixture weighing 15N hangs from a point C, by two strings AC and BC. AC is inclined at 600 to the horizontal and BC at 450 to the vertical as shown in fig. Determine the forces in the strings AC and BC. 	12 Marks	L2	CO1	PO1 PO2
	(OR)				
2.	Two cylindrical identical rollers A and B, each of weight W = 500 N are supported by an inclined plane and vertical wall and makes an angle of 300 with the horizontal as shown in Figure. Assuming all surfaces to be smooth, determine the reactions at A, B and C. 	12 Marks	L2	CO1	PO1 PO2

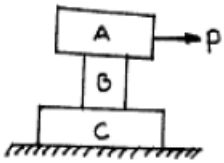
UNIT-II

3.	Determine and locate the resultant R of the forces and one couple acting on the beam as shown in figure. 	12 Marks	L2	CO1	PO1 PO2
	(OR)				
4.	The truss ABC shown in Fig. has a span of 5 m. It is carrying a load of 20 kN at its apex. Find the forces in the members AB, BC and AC, using method of joints. End A is hinged and B is supported on rollers.	12 Marks	L2	CO1	PO1 PO2



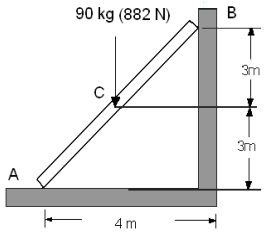
UNIT-III

5.		Find the least horizontal force 'P' to start motion of any part of the system of three blocks resting upon one another as shown in the below figure. The weights of the blocks are A = 3000N, B = 1000N, C =2000N. Between A and B μ= 0.3, between B and C, μ = 0.2 and between C and the ground μ = 0.1.	12 Marks	L2	CO1	PO1 PO2



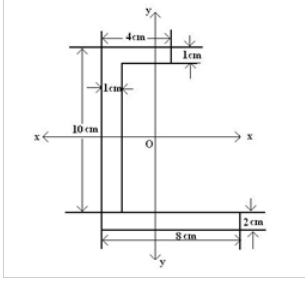
(OR)

6.		A person of mass 90 kg is standing on a ladder at point C, shown in Fig.4. The ladder rests on a rough horizontal floor at A and against a smooth vertical wall at B. If the ladder is just on the point of slipping find the coefficient of friction between the ladder and the floor. Neglect the weight of the ladder. Also find the reactions at A and B.	12 Marks	L2	CO1	PO1 PO2



UNIT-IV

7.		Find the moment of inertia of the plane area shown in figure 7 about X and Y axes through its centroid.	12 Marks	L3	CO2	PO1 PO2



(OR)

8.	a)	State and prove parallel axis theorem for area moment of inertia.	6 Marks	L2	CO2	PO1
	b)	Find the area moment of inertia of the semicircle about centroidal axes.	6 Marks	L2	CO2	PO1

UNIT-V

9.	a)	An aeroplane has a mass of 25000kg and its engines develop a total thrust of 40KN along the run way. The force of air resistance to motion of aeroplane is given by R=2.25V2where 'V' is m/s and R is in Newton. Determine the length of runway required if the plane takes off and becomes airborne at a speed of 240 km/hr.	6 Marks	L2	CO3	PO1 PO2
	b)	Distinguish between rectilinear motion and curvilinear motion.	6 Marks	L2	CO3	PO1

(OR)

10.	a)	Find amplitude and time period of a particle moving with simple harmonic motion, which has a velocity of 9 m/s and 4 m/s at the distance of 2 m and 3 m respectively from the centre.	6 Marks	L2	CO4	PO1 PO2
	b)	Derive the equation for velocity and acceleration of a particle moving with simple harmonic motion.	6 Marks	L2	CO4	PO1

CODE No.: 19BT20302 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations, December - 2022

MATERIAL SCIENCE AND ENGINEERING

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Calculate the atomic packing factor of BCC and FCC structure.	6 Marks	L3	CO1	PO3
	b)	Explain the types of crystal defects with neat sketches.	6 Marks	L2	CO1	PO2
		(OR)				
2.		Derive the expression for the Gibb's Phase rule and recall the Hume Rothery rule.	12 Marks	L3	CO1	PO4
		UNIT-II				
3.	a)	Write short notes on vacuum and plasma hardening.	6 Marks	L1	CO1	PO2
	b)	Explain the concept of time temperature transformation with a neat sketch.	6 Marks	L2	CO1	PO2 PO7
		(OR)				
4.		Define carburizing and describe the types of carburizing in detail.	12 Marks	L1	CO1	PO1
		UNIT-III				
5.	a)	Classify the types of carbon steels with their specific features and applications.	6 Marks	L2	CO2	PO1
	b)	Write a short note on Malleable and Nodular cast iron.	6 Marks	L1	CO2	PO2
		(OR)				
6.		Recall the designations of steels and mention the types, composition, properties and applications of tool steels.	12 Marks	L1	CO2	PO4
		UNIT-IV				
7.	a)	Interpret the composition, features and applications of Titanium and Cobalt materials.	6 Marks	L2	CO2	PO3
	b)	List the properties and applications of Nickel.	6 Marks	L1	CO2	PO1
		(OR)				
8.		What is magnesium? Explain the types, properties and uses of magnesium alloys in detail.	12 Marks	L1	CO2	PO2
		UNIT-V				
9.	a)	Write a brief note on properties and applications of ceramics.	6 Marks	L1	CO2	PO1
	b)	Discuss on the particle reinforced composites, and fiber reinforced composites.	6 Marks	L2	CO2	PO2 PO7
		(OR)				
10.		Tell about hybrid composites and explain the processing of structural composites with neat diagrams.	12 Marks	L1	CO2	PO2 PO7

CODE No.: 19BT20501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations, December-2022

DIGITAL LOGIC DESIGN

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Obtain the truth table of the following functions: i) $(xy + z)(y + xz)$ ii) $Y'z + wxy' + wxz' + w'x'z$	6 Marks	L2	CO1	PO1
	b)	Perform the Subtraction on the following binary numbers using 2's complement. i) 11001 - 10111 ii) 11101 - 01100	6 Marks	L3	CO1	PO1
		(OR)				
2.	a)	Convert the Decimal Number $(2680)_{10}$ in to the following bases. i) Hexa-decimal ii) Octal iii) Binary	6 Marks	L3	CO1	PO1
	b)	Express the following numbers into decimal $(10110.0101)_2$, $(16.5)_{16}$ and $(26.24)_8$	6 Marks	L3	CO1	PO1

UNIT-II

3.	a)	Express the Boolean function $F = xy + x'z$ in a product-of-max terms form.	6 Marks	L4	CO1	PO2
	b)	Draw a logic diagram using only two-input NOR gates to implement the following function. $F(A, B, C, D) = (A \oplus B)' (C \oplus D)$	6 Marks	L4	CO1	PO3
		(OR)				
4.	a)	Simply the following Boolean Expression using three-variable k-maps. $xy + x'y'z' + x'yz'$	6 Marks	L4	CO1	PO2
	b)	Simplify the following Boolean function F, together with the don't-care conditions d, and then express the simplified function in sum-of-minterms form. $F(x, y, z) = \Sigma(0,1, 4, 5, 6)$ $d(x, y, z) = \Sigma(2, 3, 7)$	6 Marks	L4	CO1	PO2

UNIT-III

5.	a)	Implement the following Boolean function with a 16 X 1 multiplexer. $F(A, B, C, D) = \Sigma m(0, 3, 5, 6, 8, 9, 14, 15)$	6 Marks	L4	CO2	PO5
	b)	Design a 4-bit priority encoder.	6 Marks	L4	CO2	PO3
		(OR)				
6.		Design a combinational circuit with three inputs and one output. The output is 1 when the binary value of the inputs is less than 3. The output is 0 otherwise.	12 Marks	L4	CO2	PO4

UNIT-IV

7.	a)	What is a shift register? Explain about the following modes of operations in a four bit shift register: i) shift right ii) shift left iii) bidirectional	6 Marks	L2	CO2	PO1
	b)	Design a clocked D flip-flop with AND and NOR gates. Draw the logic diagram and explain.	6 Marks	L4	CO2	PO4
		(OR)				
8.	a)	What is the difference between a Ripple Counter and a Synchronous Counter? Explain.	6 Marks	L4	CO2	PO2
	b)	Explain about analysis of clocked sequential circuits in detail.	6 Marks	L2	CO2	PO1

UNIT-V

9.	a)	Compare the features of PROM, PLA and PAL.	6 Marks	L4	CO2	PO2
	b)	Draw logic diagram and explain the Internal logic of a 32 X 8 ROM.	6 Marks	L2	CO2	PO1
		(OR)				
10.		Consider the following Boolean functions, given in sum-of-minterms form: $w(A, B, C, D) = \Sigma(2, 12, 13)$ $x(A, B, C, D)=\Sigma(7,8,9, 10, 11, 12, 13, 14, 15)$ $y(A, B, C, D)=\Sigma(0,2,3,4,5, 6, 7, 8, 10, 11, 15)$ $z(A, B, C, D) = \Sigma(1, 2, 8, 12, 13)$ Design a combinational circuit to implement the Boolean functions using a PAL.	12 Marks	L4	CO2	PO4

CODE No.: 19BT21501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations, December - 2022

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the steps involved in creating and executing a java program.	6 Marks	L2	CO1	PO2
	b)	Write about Naming Conventions in Java.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Give the usage of new keyword in Java.	6 Marks	L2	CO1	PO1
	b)	Explain different Java Components.	6 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	Explain about Java Control Statements with examples.	6 Marks	L2	CO1	PO2
	b)	Develop a program to generate a random number between 0 and 100.	6 Marks	L3	CO1	PO3
		(OR)				
4.	a)	Write a Program to count tokens- number of words and characters in a string using StringTokenizer class.	6 Marks	L2	CO1	PO2
	b)	Write about Scanner class in Java.	6 Marks	L1	CO1	PO1
		UNIT-III				
5.	a)	Describe Dynamic Method dispatch and the use of final keyword in Java with relevant example.	6 Marks	L2	CO2	PO2
	b)	Develop an Interest Interface which contains Simple Interest and Comp Interest methods and static final field of 25%. Write a class to implement those methods.	6 Marks	L3	CO2	PO3
		(OR)				
6.	a)	Explain method overriding with an example.	6 Marks	L2	CO2	PO2
	b)	Illustrate how an interface can be implemented and extended.	6 Marks	L3	CO2	PO3
		UNIT-IV				
7.	a)	Give and explain any two classes/interfaces of Collection Framework.	6 Marks	L2	CO2	PO1
	b)	Write a Java program that creates three threads. First thread displays - Good Morning for every one second, the second thread displays - Hello for every two seconds and the third thread displays - Welcome for every three seconds.	6 Marks	L3	CO2	PO4
		(OR)				
8.	a)	Explain the process of creating a custom exception.	6 Marks	L2	CO2	PO2
	b)	Write a Java program to change the priority of a thread.	6 Marks	L1	CO2	PO1
		UNIT-V				
9.	a)	Describe the AWT event hierarchy and explain event handling with examples.	6 Marks	L2	CO3	PO1
	b)	Explain about MVC architecture in Swings.	6 Marks	L2	CO3	PO2
		(OR)				
10.		Develop a java program that handles all mouse and key events and shows the event name at the center of the window when mouse event is fired (Use Adapter classes).	12 Marks	L3	CO3	PO5

❀ ❀ ❀

CODE No.: 16BT40101 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, December - 2022

CONCRETE TECHNOLOGY

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		What are the main compounds in Portland cement and explain their properties.	CO1	14 Marks
		(OR)		
2		Mention the different tests to be conducted on aggregate and explain about impact and crushing tests.	CO4	14 Marks

UNIT-II

3		Explain the relation between compression strength and Tensile strength of concrete.	CO2	14 Marks
		(OR)		
4		Explain the Vee-bee method of determining workability with neat sketches.	CO4	14 Marks

UNIT-III

5		Explain the procedure for UPV and Rebound hammer test.	CO5	14 Marks
		(OR)		
6		Draw the typical stress-strain curve of concrete and explain the various modulus of elasticity.	CO2	14 Marks

UNIT-IV

7	a)	Explain what mix design and how mix design will help to improve the quality of concrete.	CO7	7 Marks
	b)	Explain common terminology used in statistical evaluation of concrete.	CO2	7 Marks
		(OR)		
8		Design mix proportions with the following data using IS code method. Characteristic compressive strength of concrete 30 Mpa. 20mm Maximum size of round aggregate. Moderate degree of workability. Specific gravity of cement 3.15 specific gravity of coarse and fine aggregates 2.65. Zone III sand. Good quality control.	CO3	14 Marks

UNIT-V

9		Why Special concretes are required. Give the names of special concretes and explain any two concretes in detail.	CO6	14 Marks
		(OR)		
10		Write short notes on i) Polymer concrete ii) Ready mix concrete iii) Cold weather concreting.	CO1	14 Marks

❀ ❀ ❀

CODE No.: 16BT40102 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

ENGINEERING GEOLOGY
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Demonstrate the relevance of geology in civil engineering.	CO1	14 Marks
		(OR)		
2		Discuss the role of mechanical weathering and chemical weathering.	CO1	14 Marks

UNIT-II

3		Analyze the advantages of study of physical properties in identification of mineral over other properties. Justify the statement with proper reasons.	CO2	14 Marks
		(OR)		
4		List the textures and structures of igneous rocks.	CO2	14 Marks

UNIT-III

5	a)	What is a fold? List various types of folds with neat sketches.	CO2	9 Marks
	b)	A coal bed dips 20^0 along S40^0W and 30^0 along S40^0E. Find out the strike direction and dip direction and inclination of the tunnel to be made for the excavation of coal.	CO1	5 Marks
		(OR)		
6		Classify different geophysical investigations. Explain suitable geophysical methods for the civil engineering projects.	CO3	14 Marks

UNIT-IV

7		Define the cone of depression? Discuss the significance of radius of influence with neat sketch for a sustainable exploitation of groundwater	CO6	14 Marks
		(OR)		
8		Classify the landslides based on the types of materials such as rocks, soils and debris .List different methods to prevent them.	CO4	14 Marks

UNIT-V

9		Analyze the main causative factors of dam failures. Give one case history of dam failure due to geological considerations with a brief geological report	CO7	14 Marks
		(OR)		
10		What are the causes and effects of tunneling on the ground?	CO5	14 Marks

❀ ❀ ❀

CODE No.: 16BT40104 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, December 2022

STRUCTURAL ANALYSIS-I

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	An element has a tensile stress of 600 N/mm^2 and compressive stress of 400 N/mm^2 acting on two mutually perpendicular planes and two equal shear stress of 100 N/mm^2. Determine the principal stress and maximum shear stress.	CO2	7 Marks
	b)	An element has a tensile stress of 500 N/mm^2 and compressive stress of 300 N/mm^2 acting on two mutually perpendicular planes and two equal shear stress of 200 N/mm^2. Determine the principal stress and maximum shear stress using Mohr's Circle method.	CO2	7 Marks
		(OR)		
2	a)	Derive the expression for stresses in an inclined plane due to pure shearing.	CO1	7 Marks
	b)	At a point in a bracket the stresses on two mutually perpendicular planes are 40 N/mm^2 and 10 N/mm^2 both being tensile. The shear stress across these planes is 8 N/mm^2. Using graphical method, find the magnitude and direction of the resultant stress on a plane making an angle 40° with the plane of maximum stress. Also determine the normal and tangential stresses on the plane.	CO2	7 Marks

UNIT-II

3	a)	Derive the expression for slope and deflection of a simply supported beam of span 'l' carrying a point load at mid-span.	CO1	7 Marks
	b)	Find slope and deflection at the free end of a cantilever beam shown in fig. Moment of inertia of AC is twice the moment of inertia of BC. Use moment area method.	CO2	7 Marks
		(OR)		
4	a)	A simply supported beam of span 'l' carries a point load 'W' at a distance 'a' from the left end. Determine the deflection under the load and slope at the left end using appropriate method.	CO4	7 Marks
	b)	Determine the slope and deflection at the free end of a cantilever beam of length 'l' subjected to a uniformly varying load of 'w/m' at the fixed end and 'zero' at the free end.	CO4	7 Marks

UNIT-III

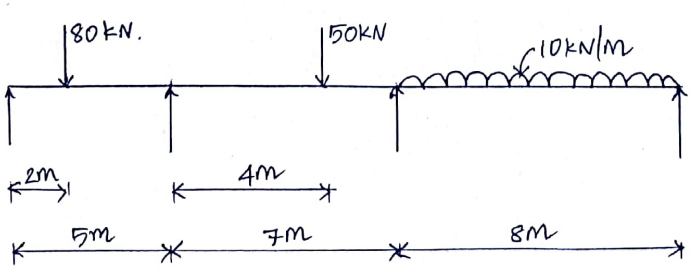
5		Define slenderness ratio. Derive the Euler's formula when both ends of the column are fixed.	CO1	14 Marks
		(OR)		
6		From the following data, determine thickness of cast-iron column: Length of column = 6 meters External diameter = 200 mm Load = 500 kN Factor of safety = 6 Assume fixed ends and ultimate compressive stress and constant for hinged ends as 570 MN/m^2 and 1/1600 respectively.	CO5	14 Marks

UNIT-IV

7	A fixed beam of 5 m span carries a point load of 150 kN at 3 m from the left end. If the right end sinks by 10.5 mm, find the fixing moments as well as reactions at the supports. Take E = 2×10^8 kN/m^2 and I = 10000 cm^4.	CO2	14 Marks

(OR)

8	For the continuous loaded beam ABCD shown in the figure, find: i) Moments at the supports ii) Reactions at the supports Draw the B.M. and S.F. diagrams also.	CO6	14 Marks



UNIT-V

9	In a steel member at a point the major principal stress is 180 MN/m^2 and the minor principal stress is compressive. If the tensile yield point of the steel is 225 MN/m^2, find the value of the major principal stress at which yielding will commence, according to each of the following criteria of failure i) Maximum Shearing Stress ii) Maximum Total Strain Energy iii) Maximum Shear Strain Energy Take Poisson's ratio=0.26.	CO3	14 Marks

(OR)

10	Derive the expression for shear center of unequal I section.	CO1	14 Marks

❀ ❀ ❀

CODE No.: 16BT40301 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, December - 2022

DESIGN OF MACHINE ELEMENTS - I

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What are the steps to be followed while designing a machine element?	CO1	7 Marks
	b)	Define the following properties of a material: i) Ductility ii) Toughness iii) Hardness and iv) Creep.	CO1	7 Marks
		(OR)		
2	a)	Analyze the significance of Factor Safety in Design	CO1	4 Marks
	b)	Determine the maximum thickness of the steel sheet into which holes of 20mm size can be punched. The ultimate tensile strength of the sheet material is 250 MPa. The allowable compressive stress during the punching operation in the hardened end of the punch is limited to 400 MPa.	CO2	10 Marks

UNIT-II

3	a)	What is meant by endurance strength of a material? How do the size and Surface condition of a component and type of load and effect such strength?	CO1	4 Marks
	b)	A circular bar of 500mm length is supported freely at its two ends. It is acted upon by a central concentrated cyclic load having a minimum value of 20kN and maximum value of 50kN. Determine the dia. of bar by taking a factor of safety of 1.5, size effect of 0.85, surface finish factor of 0.9. The material properties of bar are given by ultimate strength of 650 MPa, yield strength of 500 MPa and endurance strength of 350 MPa.	CO4	10 Marks
		(OR)		
4	a)	Formulate Soderberg's equation and state its application to different types of loading.	CO2	6 Marks
	b)	A 50mm diameter shaft is made from carbon steel having ultimate tensile strength of 630 MPa. It is subjected to a torque which fluctuates between 2000 N-m to 800 N-m. Using Soderberg method, calculate the factor of safety. Assume suitable values for any other data needed.	CO3	8 Marks

UNIT-III

5		A steam engine of effective diameter 300 mm is subjected to a stem pressure of 1.5 N/mm2. The cylinder head is connected by 8 bolts having yield point 330 MPa and endurance limit at 240 MPa. The bolts are tightened with an initial preload of 1.5 times the steam load. A soft copper gasket is used to make the joint leak-proof. Assuming a factor of safety 2, find the size of bolt required. The stiffness factor for copper gasket may be taken as 0.5.	CO5	14 Marks
		(OR)		
6		A plate 130 mm wide and 15 mm thick is to be welded to another plate by means of double parallel fillets. The plates are subjected to a static load of 90 KN. Find the length of weld if the permissible shear stress in the does not exceed 57 MPa.	CO4	14 Marks

UNIT-IV

7	A shaft supported at the ends in ball bearings carries a straight tooth spur gear at its mid span and is to transmit 7.5 kW at 300 r.p.m. The pitch circle diameter of the gear is 150 mm. The distances between the centre line of bearings and gear are 100 mm each. If the shaft is made of steel and the allowable shear stress is 45 MPa determine the diameter of the shaft. Show in a sketch how the gear will be mounted on the shaft; also indicate the ends where the bearings will be mounted?. The pressure angle of the gear may be taken as 20^0.	CO3	14 Marks

(OR)

8	Design a cast iron protective type flange coupling to transmit 15kW at 900 rpm. From an electric motor to a compressor. The service factor may be as 1.35. The following permissible stresses may be used: Shear stress for shaft, bolt and key material = 40 MPa Crushing stress for bolt and key = 80 MPa Shear stress for cast iron = 8 MPa Draw a neat sketch of the coupling.	CO3	14 Marks

UNIT-V

9	Design a cutter joint to connect two mild steel rods for a pull of 30 kN. The maximum permissible stresses are 55 MPa in tension: 40 MPa in shear and 70 MPa in crushing. Draw a neat sketch of the joint designed.	CO4	14 Marks

(OR)

10	Design a knuckle joint for a tie rod of a circular section to sustain a maximum pull of 70kN. The ultimate strength of the material of the rod against tearing is 420 MPa. The ultimate tensile and shearing strength of the pin material are 510 MPa and 396 MPa respectively. Determine the tie rod section and pin section. Take factor of safety = 6.	CO6	14 Marks

❀ ❀ ❀

CODE No.: 16BT40302 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

DYNAMICS OF MACHINERY
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	A dry single plate clutch is to be designed for an automotive vehicle whose engine is rated to give 100 kW at 2400 r.p.m. and maximum torque 500 N-m. The outer radius of friction plate is 25% more than the inner radius. The intensity of pressure between the plate is not to exceed 0.07 N/mm^2. The coefficient of friction may be assumed equal to 0.3. The helical springs required by this clutch to provide axial force necessary to engage the clutch are eight. If each spring has stiffness equal to 40 N /mm, determine the initial compression in the springs and dimensions of the friction plate	CO2	14 Marks
	(OR)		
2	Describe with the help of a neat sketch the principles of operation of an internal expanding shoe. Derive the expression for the braking torque.	CO1	14 Marks

UNIT-II

3	A ship propelled by a turbine rotor which has a mass of 5 tonnes and a speed of 2100 r.p.m. The rotor has a radius of gyration of 0.5 m and rotates in a clockwise direction when viewed from the stern. Find the gyroscopic effects in the following conditions: i) The ship sails at a speed of 30 km/h and steers to the left in a curve having 60 m radius. ii) The ship pitches 6 degree above and 6 degree below the horizontal position. The bow is descending with its maximum velocity. The motion due to pitching is simple harmonic and the periodic time is 20 seconds. The ship rolls and at a certain instant it has an angular velocity of 0.03 rad/s clockwise when viewed from stern. Determine also the maximum angular acceleration during pitching. Explain how the direction of motion due to gyroscopic effect is determined in each case.	CO2	14 Marks
	(OR)		
4	The turning moment curve for an engine is represented by the equation, $T = (20\,000 + 9500 \sin 2\theta - 5700 \cos 2\theta)$ N-m, where θ is the angle moved by the crank from inner dead centre. If the resisting torque is constant, find: i) Power developed by the engine ; ii) Moment of inertia of flywheel in kg-m^2, if the total fluctuation of speed is not exceed 1% of mean speed which is 180 r.p.m; and Angular acceleration of the flywheel when the crank has turned through 45° from inner dead centre.	CO3	14 Marks

UNIT-III

5		Explain the terms and derive expressions for 'effort' and 'power' of a Porter governor	CO1	14 Marks

(OR)

6		In a spring-controlled governor of the Hartung type, the length of the ball and sleeve arms are 80 mm and 120 mm respectively. The total travel of the sleeve is 25 mm. In the mid position, each spring is compressed by 50 mm and the radius of rotation of the mass centres is 140 mm. Each ball has a mass of 4 kg and the spring has a stiffness of 10 kN/m of compression. The equivalent mass of the governor gear at the sleeve is 16 kg. Neglecting the moment due to the revolving masses when the arms are inclined, determine the ratio of the range of speed to the mean speed of the governor. Find, also, the speed in the mid-position	CO2	14 Marks

UNIT-IV

7	a)	Write the importance of balancing.	CO1	4 Marks
	b)	A shaft carries four masses in parallel planes A, B, C and D in this order along its length. The masses at B and C are 18 kg and 12.5 kg respectively, and each has an eccentricity of 60 mm. The masses at A and D have an eccentricity of 80 mm. The angle between the masses at B and C is 100° and that between the masses at B and A is 190°, both being measured in the same direction. The axial distance between the planes A and B is 100 mm and that between B and C is 200 mm. If the shaft is in complete dynamic balance, determine : i) The magnitude of the masses at A and D ; ii) The distance between planes A and D ; and iii) The angular position of the mass at D.	CO4	10 Marks

(OR)

8	a)	Explain the terms Variation of Tractive Force, Swaying Couple, Hammer Blow.	CO1	4 Marks
	b)	The following data refer to two cylinder locomotive with cranks at 90°: Reciprocating mass per cylinder = 300 kg; Crank radius = 0.3 m; Driving wheel diameter = 1.8 m; Distance between cylinder centre lines = 0.65 m; Distance between the driving wheel central planes = 1.55 m. Determine : i) The fraction of the reciprocating masses to be balanced, if the hammer blow is not to exceed 46 kN at 96.5 kmph. ii) The variation in tractive effort ; and iii) The maximum swaying couple.	CO4	10 Marks

UNIT-V

9	a)	What are the causes and effects of vibrations?	CO1	4 Marks
	b)	Establish an expression for the natural frequency of free transverse vibrations for a simply supported beam carrying a number of point loads, by Dunkerley's method.	CO5	10 Marks

(OR)

10	a)	Explain about the Magnification Factor in forced vibration.	CO1	4 Marks
	b)	With neat sketch explain the Free Torsional Vibrations of a Three Rotor System, and deduce the equation for Torsionally Equivalent Shaft.	CO1	10 Marks

❀ ❀ ❀

CODE No.: 16BT40303 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations December-2022

FLUID MECHANICS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define viscosity and write down the units. And write down different types of fluids.	CO1	7 Marks
	b)	A plate 0.025 mm distance from a fixed plate, moves at 60 cm/sec and requires a force of 2 N per unit area i.e., 2 N/m^2 to maintain this speed. Determine the fluid viscosity between the plates.	CO2	7 Marks
		(OR)		
2		At the right limb of a simple differential manometer containing the mercury is open to the atmosphere while the left limb is connected to a pipe in which a fluid of specific gravity 0.9 is flowing. The centre of the pipe is 12cm below the level of mercury in the right limb. Find the pressure of fluid in the pipe if the difference of mercury level in the two limbs is 20 cm.	CO2	14 Marks

UNIT-II

3		A 30 cm diameter pipe, conveying water, branches into two pipes of diameters 20cm and 15cm respectively .if the average velocity in the pipe 30cm diameter is 2.5 m/sec, find the discharge in these pipe. Also determine the velocity in 15 cm pipe if the average velocity in 20 cm diameter pipe is 2m/sec.	CO4	14 Marks
		(OR)		
4		What is venturimeter? Derive an expression for the discharge through venturimeter.	CO1	14 Marks

UNIT-III

5	a)	Outline the minor energy losses in pipes.	CO1	7 Marks
	b)	The difference in water surface levels in two tanks, which are connected by three pipes in series of lengths 300 m, 170 m and 210 m and of diameters 300 mm, 200 mm and 400 mm respectively, is 12 m. determine the rate of flow of water if co-efficient of friction are 0.005, 0.0052 and 0.0048 respectively, considering: i) Minor losses also ii) Neglecting minor losses	CO5	7 Marks
		(OR)		
6		Derive an expression for the force exerted by a jet of water on stationary flat vertical and inclined plates.	CO3	14 Marks

UNIT-IV

7	a)	Explain factors to be consider for selection of a turbine at a particular place.	CO1	7 Marks
	b)	Differentiate between impulse and reaction turbine.	CO1	7 Marks
		(OR)		
8		Define the specific speed of a turbine? Derive an expression for the specific speed. What is the significance of the specific speed?	CO1	14 Marks

UNIT-V

9	a)	Describe manometric efficiency, mechanical efficiency and overall efficiency of centrifugal pump.	CO1	7 Marks
	b)	Find reasons for negative slip in a reciprocating pump? Explain with neat sketches the functions of air vessels in a reciprocating pump	CO1	7 Marks

(OR)

10		A double acting reciprocating pump, running at 50 r.p.m. is discharging 900 litres of water per minute. The pump has stroke of 400 mm. The diameter of piston is 250 mm. The delivery and suction head are 25 m and 4 m respectively. Find the slip of the pump and power required to drive the pump.	CO6	14 Marks

CODE No.: 16BT40304 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, December 2022

MACHINE TOOLS AND MODERN MACHINING PROCESSES

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	List the various types of chips formed during machining. Under what conditions those chips will be formed.	CO6	7 Marks
	b)	A carbide tool with mild steel work piece was found to give a life of 2 hours while cutting at 0.5 mpm. Compute the tool life if the same tool is used at a speed of 25% higher than the previous one. Also determine the value of cutting speed if the tool is required to have tool life of 3 hours. Assume Taylor's exponent n=0.27.	CO4	7 Marks
		(OR)		
2	a)	Define cutting speed, feed, depth of cut and explain the principle angles of ORS.	CO6	7 Marks
	b)	Analyze the reasons for tool failure. Explain in detail.	CO2	7 Marks
		UNIT-II		
3	a)	Classify different types of lathes. Explain any one in detail.	CO2	7 Marks
	b)	Explain the taper turning attachment with a neat sketch.	CO1	7 Marks
		(OR)		
4	a)	Differentiate between turret and Capstan lathes.	CO1	7 Marks
	b)	Explain about Multi spindle automatic lathes.	CO1	7 Marks
		UNIT-III		
5	a)	Explain with a neat sketch the working of quick return mechanism used in a shaping machine	CO1	7 Marks
	b)	Differentiate between shaper and planer.	CO2	7 Marks
		(OR)		
6	a)	Explain the construction of a Radial drilling machine with a neat sketch.	CO1	7 Marks
	b)	Discuss Jig boring machine.	CO1	7 Marks
		UNIT-IV		
7	a)	Mention the various types of bonds used in the making of grinding wheel. Discuss them in brief.	CO2	7 Marks
	b)	Write a short note on loading and glazing of a grinding wheel.	CO3	7 Marks
		(OR)		
8	a)	Define indexing. Describe direct indexing with an example.	CO4	7 Marks
	b)	Illustrate the design principle of Jigs and fixtures.	CO3	7 Marks
		UNIT-V		
9	a)	Classify the modern machining processes and their applications.	CO5	7 Marks
	b)	List the advantages of modern machining processes.	CO5	7 Marks
		(OR)		
10	a)	Explain about the Electro~discharge machining.	CO5	7 Marks
	b)	List the advantages, limitations and applications of EDM.	CO2	7 Marks

❀ ❀ ❀

CODE No.:16BT40305 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

THERMAL ENGINEERING - I

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain working of four stroke diesel engine with the help of neat sketches.	CO1	7 Marks
	b)	Draw port timing diagram for two stroke petrol engine.	CO1	7 Marks
		(OR)		
2	a)	What is the difference between air-standard cycle and fuel-air cycle analysis? Explain the significance of the fuel-air cycle.	CO1	7 Marks
	b)	Explain with the help of a p-V diagram the loss due to variation of specific heats in an Otto cycle.	CO1	7 Marks

UNIT-II

3	a)	Explain various stages of combustion in CI engine on P-θ diagram.	CO2	7 Marks
	b)	Explain the factors that affect normal combustion.	CO2	7 Marks
		(OR)		
4	a)	Explain the factors affecting flame propagation.	CO1	6 Marks
	b)	What is meant by abnormal combustion? Explain the phenomena of detonation in CI engines.	CO4	8 Marks

UNIT-III

5	a)	What is a dynamometer? List out the different types of dynamometer.	CO1	4 Marks
	b)	A two stroke diesel engine was motored when the meter reading was 1.5 kW, Then the test on the engine was carried out for one hour and the following observations were recorded: Brake torque = 120 Nm, Speed=600 rpm, Fuel used 2.5 kg, Calorific value of fuel = 40.3 MJ/kg, Cooling water used = 818 kg, Rise in temperature of cooling water = 10 ^{0}C, Exhaust gas temperature = 345 ^{0}C, Room temperature = 25 ^{0}C, A/F=32:1. Determine i) BP, ii) IP, iii) Mechanical efficiency, iv) Draw heat balance sheet on minute basis and also in percentage.	CO3	10 Marks
		(OR)		
6	a)	Describe how an Indicated power of each cylinder of a multi-cylinder engine is measured?	CO1	7 Marks
	b)	Explain the procedure for preparing heat balance sheet.	CO3	7 Marks

UNIT-IV

7	a)	Define ultimate analysis and proximate analysis of coal. Explain how sampling of coal is done in a boiler trial.	CO1	4 Marks
	b)	The volumetric composition of a coal gas is given as H_2 = 25%, CO = 7%, CH_4 = 48%, C_2H_4 = 11%, CO_2 = 4% and N_2 = 3%. If 50% excess air is supplied, find the percentage composition by volume of the products assuming H_2O produced is perfect gas.	CO5	10 Marks
		(OR)		
8	a)	What is the significance of Adiabatic flame temperature?	CO1	4 Marks
	b)	Describe the working of the apparatus that is commonly used for the analysis of dry exhaust gases. Discuss about the probable sources of error in such an analysis.	CO1	10 Marks

UNIT-V

9	a)	What are the advantages of multi-stage compression over a single stage compression for the same pressure ratio? Why intercooling is necessary in multi-stage compression?	CO2	7 Marks
	b)	Compare rotary and reciprocating compressors.	CO1	7 Marks
		(OR)		
10	a)	Define volumetric efficiency of a compressor and explain why it is less than unity.	CO1	4 Marks
	b)	A single-stage double-acting air compressor delivers 15 m^3/min of air measured at 1.013 bar and temperature 27 ^{0}C and delivers at 7 bar. The conditions at the end of the suction stroke are pressure 0.98 bar and temperature 40 ^{0}C. The clearance volume is 4% of the swept volume and the stroke/bore ratio is 1.3/1, compressor runs at 300 rpm. Calculate the volumetric efficiency, cylinder dimensions, indicated power and isothermal efficiency of this compressor. Take the index of compression and expansion as 1.3.	CO2	10 Marks

CODE No.: 16BT40401 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, December - 2022

ANALOG COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

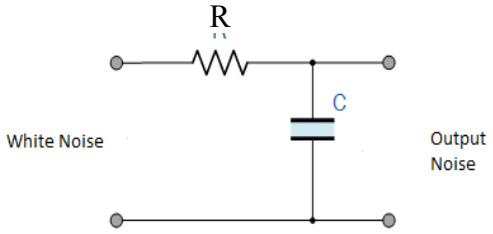
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the operation of coherent detection of DSB-SC modulating wave and show that the overall output $V_0(t) = 1/2\ A_c Cos Øm(t)$.	CO5	6 Marks
	b)	Briefly explain the Quadrature Null Effect in DSB-SC coherent detection. Suggest an appropriate method to offset this problem.	CO1	8 Marks

(OR)

2	a)	With a neat diagram, explain how SSB wave is generated using phase discriminator method with only USB and rejecting the LSB.	CO1	10 Marks
	b)	Derive and show that the noise equivalent band width for RC low pass filter is 1/4RC.	CO5	4 Marks



UNIT-II

3	a)	With the help of circuit diagram, explain demodulation of FM wave using balanced frequency discriminator.	CO1	8 Marks
	b)	Determine the modulation index and bandwidth for FM and PM signals for a modulating signal 5 cos 30000 π t angle modulates a carrier A cos2π fct. Assume $K_f=K_p$ =15KHz/volt.	CO3	6 Marks

(OR)

4	a)	Explain with relevant mathematical expressions for the demodulation of an FM signal using PLL.	CO1	8 Marks
	b)	An FM signal is given by s(t) = 2cos20000πt+cos2000πt+3cos40000πt. Determine the bandwidth and β assuming K_f=104Hz/Volts.	CO3	6 Marks

UNIT-III

5	a)	Derive the expression for SNR in a PM system for tone modulation.	CO2	8 Marks
	b)	A phase modulation (PM) system, with the modulated wave defined by S (t) =AcCos [2πfct + kpm(t)] where kp is a constant and m(t) is the message signal. The additive noise n(t) at the phase detector input is $n(t)= n_I(t)\cos(2\pi fc\ t)-n_Q(t)\ \sin\ 2\pi fct$ Assuming that the carrier-to-noise ratio at the detector input is high compared with unity, determine. i) The output signal-to-noise ratio. ii) The figure of merit of the system.	CO4	6 Marks

(OR)

6	a)	Derive the expression of SNR and figure of merit for SSB-SC.	CO2	8 Marks
	b)	If each stage has a gain of 10dB and noise figure of 10dB. Determine the overall noise figure of a two stage cascaded amplifier.	CO4	6 Marks

UNIT-IV

7	a)	What do you mean by automatic gain control (AGC)? What are merits of delayed AGC over simple AGC?	CO2	7 Marks
	b)	The antenna current of transmitter is 11.5 Amp when it is modulated to a depth 45% by audio sine wave. Determine unmodulated (carrier) current.	CO6	7 Marks

(OR)

8	a)	What is image frequency rejection ratio and what is its importance?	CO1	7 Marks
	b)	In a broadcast super heterodyne receiver tuning at 1200 kHz having no RF amplifier, the loaded Q of the antenna coupling circuit is 100, By Considering standard IF frequency determine the Image frequency and its rejection ratio.	CO6	7 Marks

UNIT-V

9	a)	Write short notes on the following: i) Single polarity PAM; ii) Double polarity PAM.	CO1	6 Marks
	b)	With a neat block diagram, explain the working of TDM technique.	CO1	8 Marks

(OR)

10	a)	Explain the concept of multiplexing in communication.	CO1	6 Marks
	b)	Differentiate between FDM and TDM. Explain which of the two is superior and why.	CO2	8 Marks

CODE No.: 16BT40403 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

ELECTROMAGNETIC THEORY AND TRANSMISION LINES
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Obtain the expressions for the far field and the potential due to a small electric dipole oriented along z-axis. Find the potential at (0,1,3) due to the small electric dipole placed at (0,0,0).	CO4	7 Marks
	b)	State Biot-savart's Law. Formulate an expression for Straight Filamentary Conductor of finite length.	CO1	7 Marks

(OR)

2	a)	Calculate induced electric field intensity for $r < 2$ and $r > 2$, if the magnetic flux density B=20 *sin* wt, *for* $r < 2$ and $B = 0$ *for* $r>2$.	CO4	7 Marks
	b)	Write the word statements for Maxwell's two equations for magnetostatic fields and explain their significance.	CO1	7 Marks

UNIT-II

3	a)	Explain the concept of Transformer and Motional EMFs. Formulate the related expressions.	CO1	8 Marks
	b)	Derive the electrostatic Boundary Conditions for i) Dielectric – Dielectric Boundary ii) Conductor – Dielectric Boundary iii) Conductor – Free Space Boundary	CO5	6 Marks

(OR)

4	a)	Outline the Final statements of Maxwell's Equations for Time Varying Fields. Represent the Final forms of Maxwell's Equations in Point and Integral forms.	CO1	7 Marks
	b)	Show that the Continuity equation for time varying fields is different from that of static fields.	CO6	7 Marks

UNIT-III

5	a)	Illustrate the reflection by a perfect conductor at oblique incidence for parallel polarization. Formulate the expressions for fields, reflection and transmission coefficients.	CO2	7 Marks
	b)	Define a uniform Plane wave and obtain the general solution of the uniform plane wave.	CO5	7 Marks

(OR)

6	a)	Derive the expressions for attenuation constant (α), phase constant (β), phase velocity (v_p) and intrinsic impedance (η).	CO2	7 Marks
	b)	Find all relations between E and H in a uniform Plane wave. Also Estimate the Value of intrinsic impedance of free space.	CO5	7 Marks

UNIT-IV

7	a)	Derive the characteristic impedance in terms of line constants.	CO2	8 Marks
	b)	A lossless transmission line of length 100m has an inductance of 28 μ H and capacitance of 20 nF. Find out i) Propagation velocity ii) Phase constant at an operating frequency of 100 KHz iii) Characteristic impedance of the line.	CO6	6 Marks

(OR)

8	a)	Derive the expressions for phase velocity and group velocity and relate them.	CO2	6 Marks
	b)	List and explain the various parameters that are assessed from transmission line equations.	CO1	8 Marks

UNIT-V

9	a)	Develop a step wise procedure to design single stub matching using smith chart.	CO6	7 Marks
	b)	Design a single stub match for a load of 150+j225 ohms for a 75 ohms line at 500 MHz using smith chart.	CO3	7 Marks

(OR)

10	a)	List the applications of smith chart. Also suggest a procedure to match a single stub to transmission line using smith chart.	CO6	7 Marks
	b)	Design a single stub (Short circuited shunt stub) matching network for a transmission line terminated with ZR=200-J400 ohms to obtain matching for maximum length of the transmission line. The characteristic impedance of the line is Zo=50 ohms.	CO4	7 Marks

CODE No.: 16BT40404 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations December-2022

LINEAR IC APPLICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	List and explain the function of all the basic building blocks of an op-amp.	CO1	7 Marks
	b)	Define common mode rejection ratio. Explain its significance.	CO1	7 Marks
		(OR)		
2	a)	Explain the terms i) slew rates; ii) CMRR; iii) PSRR; iv) Drift.	CO1	8 Marks
	b)	Explain clearly about the stability of op-amp, with the help of open loop gain vs frequency curve.	CO1	6 Marks

UNIT-II

3	a)	Draw and explain the circuit of V/I converter if the load is i) Floating; ii) Grounded.	CO3	7 Marks
	b)	Explain clearly the requirements of a practical differentiator with the help of its frequency response.	CO3	7 Marks
		(OR)		
4	a)	What is a precision diode? Draw and briefly explain the operation of a circuit that detects the peak value of any given signal.	CO4	7 Marks
	b)	Explain the operation of an Astable multivibrator using op-amp and also derive for its frequency of output.	CO3	7 Marks

UNIT-III

5	a)	Explain the necessity and operation of all the parts of a series op-amp regulator.	CO1	6 Marks
	b)	Derive the transfer function for a general second order active filter using op-amp. Show its frequency response for different damping constants.	CO2	8 Marks
		(OR)		
6	a)	Design a band pass filter so that f_o=2KHz, Q=20 and A_o=10 with C=1μF.	CO3	7 Marks
	b)	Explain how current limiting and current fold back characteristics are obtained in IC 723 regulator.	CO3	7 Marks

UNIT-IV

7	a)	Explain how a 555 timer in its Astable mode can be connected as a pulse position modulator?	CO1	7 Marks
	b)	Draw the circuit of PLL AM detector and explain its operation.	CO1	7 Marks
		(OR)		
8	a)	What is capture range? Derive the expression for lock range in a PLL.	CO1	7 Marks
	b)	Draw the circuit of a Schmitt trigger using 555 timer and explain its operation.	CO1	7 Marks

UNIT-V

9	a)	Explain about the successive approximate conversion in an ADC. Why it is advantages over the other methods of ADCs.	CO1	8 Marks
	b)	Explain about: i) Resolution; ii) Linearity; iii) Monotonicity.	CO1	6 Marks
		(OR)		
10	a)	Which type of ADC is fastest? Explain clearly why?	CO1	7 Marks
	b)	Explain clearly the D/A conversion in a 3-bit R-2R ladder circuit.	CO1	7 Marks

❀ ❀ ❀

CODE No.: 16BT40405 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, December 2022

PROBABILITY AND STOCHASTIC PROCESS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

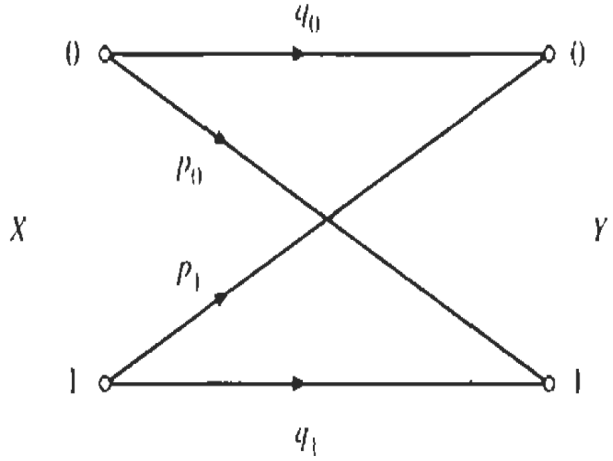
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Discuss about Bernoulli's Trails. Obtain the expression for Binomial Probability.	CO1	6 Marks
	b)	In the experiment of throwing two fair dice, let *A* be the event that the first die is odd, B be the Event that the second die is odd, and C be the event that the sum is odd. Show that events *A,* B, and C are pair wise independent, but *A, B,* and C are not independent.	CO1	8 Marks

(OR)

2		Consider the binary communication channel shown in Fig. The channel input symbol X may assume the state 0or the state 1, and, similarly, the channel output symbol Y may assume either the state 0or the state 1. Because of the channel noise, an input 0may convert to an output 1 and vice versa: i) Find Output Probabilities at 0 and 1 ii) If a 0 was observed at the output, what is the probability that a 0 was the Input state? iii) If a 1 was observed at the output, what is the probability that a 1 was the input state? iv) Calculate the probability of error.	CO4	14 Marks



UNIT-II

3	a)	State and prove the properties of the probability density function.	CO2	6 Marks
	b)	A random variable X has the following probability distribution.	CO3	8 Marks

x:	0	1	2	3	4	5	6	7
p(x):	0	K	2K	2K	3K	K2	2K2	7K2+K

Calculate

i) The value of k ii) $P(X>4.5)$ iii) $P(X\leq 4.5)$
iv) $P(X=4.5)$ v) $P(1.5<X<4.5/X>2)$

(OR)

4	a)	State and prove properties of characteristic function of a random variable *X*.	CO2	7 Marks
	b)	Find the moment generating function of binomial distribution. Obtain the expression for variance and mean.	CO3	7 Marks

UNIT-III

5	a)	State Central Limit theorem.	CO1	6 Marks
	b)	Consider an experiment of drawing randomly three balls from an urn containing two red, three white, and four blue balls. Let (X, Y) be a bivariate random variable where X and Y denote, respectively, the number of red and white balls chosen. i) Find the range of (X, Y). ii) Find the joint pmf's of (X, Y). iii) Find the marginal pmf's of X and Y.	CO3	8 Marks

(OR)

6	a)	Discuss about Joint Density Function and mention its properties.	CO1	6 Marks
	b)	The joint pdf of a bivariate r.v. (X, Y) is given by; $F_{XY}(x,y) = \begin{cases} k(x+y) & 0<x<2 \quad 0<y<2 \\ 0 & Otherwise \end{cases}$ Where k is a constant. i) Find the value of k. ii) Find the marginal pdf's of X and Y. iii) Are X and Y independent? iv) Find P(X+Y≤1)	CO3	8 Marks

UNIT-IV

7	a)	Define a K^{th}-order stationary random process. When it will become a SSS Process.	CO1	7 Marks
	b)	A random process is defined by Y(t)= X(t) cos($\omega_o t+\theta$) where X(t) is WSS random process that amplitude modulates a carrier of constant angular frequency ω_o with a random phase θ independent of X(t) and uniformly distributed on(-∏,∏). Is Y(t) a WSS random process.	CO4	7 Marks

(OR)

8	a)	State and prove the properties of autocorrelation function.	CO1	7 Marks
	b)	Model a random telegraph signal process $Y(t) = \lambda X(t)$ is a Wide Sense Stationary Process Where λ is a random variable which is $X(t)$ independent of and assumes values -1 and +1 with equal probability and $R_{x_1,x_2}(t_1,t_2) = e^{-2\lambda\|t_1-t_2\|}$.	CO4	7 Marks

UNIT-V

9	a)	What type of noise associated with respect to presence of signal and explain it briefly.	CO3	7 Marks
	b)	For a nonlinear amplifier with two input frequencies 3KHz, and 8KHz, determine: i) First 3 harmonics present in the output for each input frequency. ii) Cross-Product frequencies produced for values of m and n of 1 and 2 respectively.	CO3	7 Marks

(OR)

10	a)	For a non-ideal amplifier having following parameters, Input Signal Power=2×10^{-10}W, Input Noise Power=2×10^{-18} W, Power gain=60dB, Internal Noise =6×10^{-12} W Determine: i) Input S/N Ratio(dB) ii) Output S/N Ratio(dB) iii) Noise Factor iv) Noise Figure	CO3	7 Marks
	b)	Determine : i) 2^{nd}, 3^{rd} and 12^{th} harmonics for a 1KHz periodic wave. ii) Percent 2^{nd} order , 3^{rd} order and total harmonic distortion for a fundamental frequency with an amplitude of 8 V_{rms}, a 2^{nd} harmonic amplitude of 0.2Vrms and 3^{rd} harmonic amplitude of 0.1 V_{rms}	CO3	7 Marks

❁ ❁ ❁

CODE No.:16BT40406 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC16) Supplementary Examinations December - 2022

PULSE AND DIGITAL CIRCUITS

[ELECTRONICS AND COMMUNICATION ENGINEERING]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

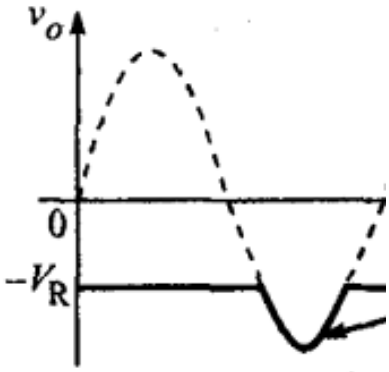
1.	a)	Prove that an RC circuit behaves as a good integrator if RC>>15T. Where T is the period of an input '$E_m \sin\omega t$'.	CO2	6 Marks
	b)	A symmetrical square wave peak-to-peak amplitude 10V and frequency 10KHz is applied to a High pass RC circuit. Sketch the input and output waveforms to scale and derive the necessary output voltage expressions.	CO4	8 Marks

(OR)

2.	a)	Explain application of attenuator as a CRO Probe.	CO1	7 Marks
	b)	Analyze the response of low pass RC circuit for a square input for different time constants.	CO2	7 Marks

UNIT-II

3.	a)	Explain in detail about practical clamping circuit with aid of neat sketches.	CO1	7 Marks
	b)	Design a series clipper circuit that produces a following waveform. Assuming that input applied voltage is 50V (P-P), V_R=-10V and assume Diode is Ideal.	CO3	7 Marks



(OR)

4.	a)	In a clamping circuit, for symmetrical square wave Asses the parameters of ratio of area in forward direction to area in reverse direction in terms of forward resistance $R_f$to reverse resistance R_r .	CO6	8 Marks
	b)	Explain the operation of a biased negative clamper with neat sketch.	CO1	6 Marks

UNIT-III

5.	a)	Explain the working of a fixed-bias binary with the help of neat circuit diagrams.	CO1	6 Marks
	b)	Design a collector coupled one-shot multivibrator using n-p-n silicon transistors, Neglect I_{CBO} and the junction voltages. Assume $h_{FE(min)}$ = 20, V_{BE} = -1V for the transistor in cut-off and $I_B = 1.5I_{B(min)}$ for the transistor in saturation. Vcc = 12V, I_C(sat) = 2mA, T = 2msec, and $R_1 = R_2$. Find R_C, R, V_{BB}, R_1 and C.	CO3	8 Marks

(OR)

6.	a)	Design a collector-coupled monostable multivibrator with a gate width of 5ms using n-p-n silicon transistors.	CO3	8 Marks
	b)	With the help of neat diagrams discuss the different methods of triggering a binary.	CO1	6 Marks

UNIT-IV

7.	a)	Explain the basic principles of Miller and bootstrap time - base generators.	CO1	7 Marks
	b)	Write important applications of time-base circuits. With reference to time base circuits define the following terms: i) Fly back time; ii) Transmission error.	CO2	7 Marks

(OR)

8.	a)	Design a transistor bootstrap ramp generator to provide an output amplitude of 12V over a time period of 2 ms. The input signal is negative going pulse with an amplitude of 5V, a pulse width of 2 ms and the time interval between pulses is 0.5 ms. The load resistance is 2 kΩ and the ramp is to be linear within 1%. The supply is 15V.Take $h_{FE(min)}$= 80. Assume the necessary data.	CO3	6 Marks
	b)	Apply an appropriate sweep circuit to obtain the gain value 1.	CO5	8 Marks

UNIT-V

9.	a)	Draw and explain the operation of 4 diode sampling gate.	CO1	7 Marks
	b)	Draw and explain the operation of TTL NAND gate circuit and explain the importance of Totempole output.	CO6	7 Marks

(OR)

10.	a)	Draw and explain the operation of Bidirectional sampling gate.	CO1	7 Marks
	b)	Draw and explain the operation of ECL NOR/OR circuit.	CO1	7 Marks

CODE No.: 16BT40502 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

DATABASE MANAGEMENT SYSTEMS

[Common to Computer Science and Engineering, Computer Science and Systems Engineering, Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Discuss the features of ER-models?	CO2	7 Marks
	b)	Define Data Abstraction and discuss levels of Abstraction.	CO1	7 Marks
		(OR)		
2	a)	What are the various types of attributes? Explain each with an example.	CO5	7 Marks
	b)	List the different types of database users? Write in detail about their roles.	CO1	7 Marks
		UNIT-II		
3	a)	Illustrate different set operations in relational algebra with examples.	CO5	7 Marks
	b)	Explain in detail how to query relational data.	CO5	7 Marks
		(OR)		
4	a)	Explain about any four relational algebra operations with examples.	CO5	7 Marks
	b)	Differentiate DRC and TRC.	CO2	7 Marks
		UNIT-III		
5	a)	Define trigger and explain its three parts? Differentiate row level and statement level triggers.	CO2	7 Marks
	b)	Discuss about Complex Integrity Constraints in SQL.	CO1	7 Marks
		(OR)		
6	a)	Discuss about Join dependencies and Fifth normal form.	CO1	7 Marks
	b)	What is the form of basic SQL query? Explain.	CO1	7 Marks
		UNIT-IV		
7	a)	Illustrate concurrent execution of transaction with examples?	CO5	7 Marks
	b)	Discuss Serializability in detail.	CO1	7 Marks
		(OR)		
8	a)	Explain the concept of shadow paging with a suitable example.	CO2	7 Marks
	b)	Describe the various transaction states in detail.	CO1	7 Marks
		UNIT-V		
9	a)	Explain in detail about ISAM?	CO1	7 Marks
	b)	Explain B+ trees? Discuss about the Dynamic Index Structure?	CO3	7 Marks
		(OR)		
10	a)	Describe the Intuitions for tree Indexes in detail.	CO1	7 Marks
	b)	Discuss in detail about RAID.	CO1	7 Marks

❀ ❀ ❀

CODE No.: 16BT41201 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations December-2022

DESIGN AND ANALYSIS OF ALGORITHMS

[Common to Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

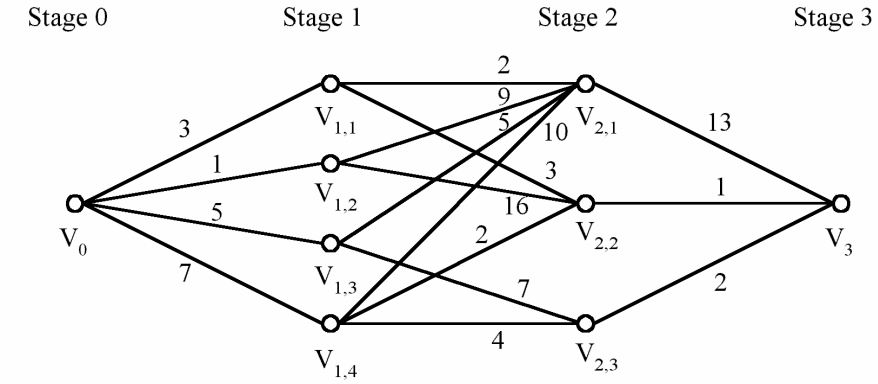
1	a)	Briefly describe the asymptotic notation of algorithms.	CO1	7 Marks
	b)	Design an algorithm for finding the number of binary digits for a positive decimal integer.	CO3	7 Marks
		(OR)		
2	a)	Consider two functions $f(n) = 3n^2+5$ and $g(n)=n^2$. Prove with graphical representation that asymptotic upper bound of f(n) is g(n).	CO2	7 Marks
	b)	Distinguish between Big Oh and Big Omega notation.	CO2	7 Marks

UNIT-II

3	a)	Explain weighted UNION rule with an example.	CO1	7 Marks
	b)	Outline an algorithm for weighted union rule and calculate its time complexity.	CO2	7 Marks
		(OR)		
4	a)	Explain BFS algorithm with an example.	CO1	7 Marks
	b)	Differentiate BFS and DFS.	CO2	7 Marks

UNIT-III

5	a)	Explain the control abstraction for Divide and conquer.	CO1	7 Marks
	b)	Explain binary search algorithm and find its time complexity.	CO4	7 Marks
		(OR)		
6	a)	Determine the shortest path from V0 to V3 of the following electrical network graph, using greedy method. Identify the optimal solution. Does greedy method gives an optimal solution?	CO1	10 Marks



	b)	Prove that the edge with the smallest weight will be part of every minimum spanning tree.	CO4	4 Marks

UNIT-IV

7	a)	State sum of subset problem. How to solve this problem using backtracking, explain it with suitable example?	CO1, CO4	7 Marks
	b)	Illustrate a recursive backtracking algorithm to solve sum of subset problem.	CO3	7 Marks
		(OR)		
8	a)	Draw the state space tree for m coloring when n=3 and m=3.	CO2	7 Marks
	b)	Solve the 8-queens problem using backtracking.	CO5	7 Marks

UNIT-V

9	a)	State 15-puzzle problem. Solve 15-puzzle problem using state space tree	CO1, CO4	9 Marks
	b)	Outline the control abstraction for LC search.	CO1	5 Marks
		(OR)		
10	a)	Explain about Nondeterministic and Deterministic algorithms.	CO1	7 Marks
	b)	Explain in detail about NP-hard and NP-Complete problems.	CO1	7 Marks

CODE No.: 16BT41202 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, December 2022

JAVA PROGRAMMING

[Common to Computer Science and Engineering; Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the steps involved in creating and executing a java program.	CO1	7 Marks
	b)	Design a program to implement Money class. This class should have fields for initializing a rupee and paisa value. The paisa value will be in the range from 0 – 99 with the paisa being the same sign as that of rupees. The class should have all reasonable constructors, addition and substraction methods, and a **main()** method that provides a thorough test of all the methods in the class.	CO6	7 Marks
		(OR)		
2	a)	Java compiled and interpreted. Justify.	CO4	5 Marks
	b)	Create a class Rectangle. The class has two attributes, length and width, each of which defaults to 0. It has methods that calculate the perimeter and area of the rectangle. It has set and get methods for both length and width. The set methods should verify that length and width are floating – point numbers larger than 0.0 and less than 20.0.	CO3	9 Marks

UNIT-II

3	a)	Explain final keyword with all its usages. Support explanation with a program.	CO1	7 Marks
	b)	Explain the various forms of implementing interfaces.	CO1	7 Marks
		(OR)		
4	a)	What are Nested Interfaces? Explain with a suitable example.	CO1	7 Marks
	b)	Create a class within the package "AmountInWords" to convert the amount into words. (Consider the amount to be nor more than 100000.)	CO3	7 Marks

UNIT-III

5	a)	Explain the steps in creating a thread using Runnable interface.	CO1	6 Marks
	b)	Design a java program that demonstrates how a high-priority thread using sleep makes way for the lower-priority threads to execute.	CO3	8 Marks
		(OR)		
6	a)	What is a try-with-resources block and how it is used?	CO1	4 Marks
	b)	Consider a Student examination database system that prints the marksheet of students. Input the following from the command line: i) Student's name ii) Marks in six subjects These marks should be between 0 to 100. If the marks are not in the specified range, raise a RangeException, else find the total marks and print the percentage of the student.	CO6	10 Marks

UNIT-IV

7	a)	Design a program that shows a screen sot with an applet running inside the applet viewer. The applet should display your name.	CO5	6 Marks
	b)	Explain the difference between with a suitable example: i) Vector and ArrayList. ii) Enumeration and Iterator.	CO1	8 Marks
		(OR)		

8	a)	Explain the use of overriding the following methods for an applet. init() start() stop() destroy() paint()	CO1	6 Marks
	b)	Create a collection class named Queue to implement the FIFO order of queues.	CO3	8 Marks

UNIT-V

9	a)	How is the concept of inner classes used for event handling?	CO2	7 Marks
	b)	What is the difference between doGet () and doPost () or GET and POST?	CO1	7 Marks

(OR)

10	a)	What do you mean by HTTP servlet request and response? What is the procedure for initializing a servlet?	CO1	7 Marks
	b)	What is the advantage of having anonymous classes while handling events in Java?	CO1	7 Marks

CODE No.:16BT41203 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

SOFTWARE ENGINEERING

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	How RAD Model solves inherent problems that result in software project? Explain with an application.	CO1	7 Marks
	b)	What is prototype? Explain the process of prototype development with diagram. Mention benefits of using prototype.	CO1	7 Marks
		(OR)		
2	a)	What is Agility in context of software engineering? Explain extreme programming (XP) with suitable diagram.	CO1	7 Marks
	b)	Explain briefly about Unified process model.	CO1	7 Marks

UNIT-II

3		Explain briefly requirements engineering process.	CO2	14 Marks
		(OR)		
4		Draw use case and dataflow diagrams for a restaurant system the activities of the restaurant system are listed below. Receive the customer food orders, produce the customer ordered foods, serve the customer with their ordered foods, collect payment from customers, store customer payment details, order raw materials for food products, pay for raw materials and pay for labor.	CO3	14 Marks

UNIT-III

5	a)	What are the design principles of a good software design? Explain them.	CO3	7 Marks
	b)	Explain with the help of suitable diagram architecture trade off analysis method.	CO4	7 Marks
		(OR)		
6	a)	Explain briefly software architecture style and architecture pattern.	CO3	7 Marks
	b)	Describe the golden rules for interface design?	CO3	7 Marks

UNIT-IV

7	a)	What is cyclomatic complexity? Explain with an example how to construct a flow graph for a program (Fibonacci series) and compute cyclomatic complexity.	CO5	7 Marks
	b)	What are the various testing strategies to software testing? Discuss them briefly?	CO5	7 Marks
		(OR)		
8	a)	What is black box testing? Is it necessary to perform this? Explain various test activities.	CO5	7 Marks
	b)	What is white box testing? Is it necessary to perform this? Explain various test activities.	CO5	7 Marks

UNIT-V

9	a)	Describe the Mc Call's quality factors and ISO 9126 quality factors.	CO6	7 Marks
	b)	Discuss Reactive and proactive risk strategies.	CO6	7 Marks
		(OR)		
10	a)	Explain RMMM& RMMM plan.	CO6	7 Marks
	b)	Discuss about SQA.	CO6	7 Marks

❀ ❀ ❀

CODE No.: 16BT41204 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, December - 2022

THEORY OF COMPUTATION

[Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Construct a DFA equivalent to the NFA. CO3 10 Marks
M=({p,q,r},{0,1},δ,p,{q,s}) Where δ is defined in the following table:

	0	1
p	{q,s}	{q}
q	{r}	{q,r}
r	{s}	{p}
s	-	{p}

b) Tabulate the differences between Moore and Mealy machines. CO2 4 Marks

(OR)

2 a) Convert the following ε-NFA to DFA CO5 10 Marks

states	ε	a	b	C
p	Φ	{p}	{q}	{r}
q	{p}	{q}	{r}	Φ
*r	{q}	{r}	Φ	{p}

b) List and explain briefly about the components of Finite automaton model. CO1 4 Marks

UNIT-II

3 a) Construct a NFA equivalent to the regular expression (10+11)*00. CO5 10 Marks

b) Prove that the language $L=\{a^m b^n | m=n\}$ is not regular. CO5 4 Marks

(OR)

4 a) List the applications of regular expressions and write the regular expression for following sets: CO3 7 Marks

i) The set of all strings over {0,1} having at most one pair of 0's or at most of one pair of 1's.

ii) The set of all strings over {a,b} in which there are at least two occurrences of b between any two occurrences of a.

b) State and explain pumping lemma for regular languages. List the applications of pumping lemma. CO1 7 Marks

UNIT-III

5 a) Obtain a CFG to generate the set of all strings over alphabet {a,b} with exactly twice as many a's as b's. CO3 7 Marks

b) Show that the grammar is ambiguous. CO1 7 Marks
S→aSbS|bSaS|Є

(OR)

6	a)	Remove useless symbols and use less productions from the given grammar S → aAa A → Sb|bcc|DaA C → abb|DD E → ac D → aDA	CO2, CO5	8 Marks
	b)	Explain pumping lemma for context free languages.	CO1	6 Marks
		UNIT-IV		
7	a)	Define pushdown automata and explain its model with a neat diagram.	CO3	6 Marks
	b)	Construct PDA generating all odd palindromes over string {a, b, c}.	CO3	8 Marks
		(OR)		
8	a)	Construct PDA for the following grammar S → aABB|aAA A → aBB|a B → A.	CO2, CO3	10 Marks
	b)	Write short notes on Deterministic Pushdown Automata.	CO1	4 Marks
		UNIT-V		
9		Define Turing machine and give an example. Also explain different types of TM's.	CO1	14 Marks
		(OR)		
10	a)	Differentiate multi tape and multi stack Turing machines.	CO2	7 Marks
	b)	Design a Turing machine that computes a function f(x, y) = x + y.	CO4	7 Marks

CODE No.: 19BT40103 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

HYDRAULIC ENGINEERING
[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What is the 'no slip condition' at the boundary? Explain boundary layer concept with a neat sketch.	6 Marks	L2	CO1	PO1 PO10
	b)	An aeroplane weighing 39.24 kN is flying in a horizontal direction at 360 km/h. The plane spans 15 m and has a wing surface area of 35 sq.m. If drag coefficient is 0.03 and density of air is 1.22 kg/m^3, determine coefficient of lift, power required to drive the plane and theoretical value of the boundary layer circulation.	6 Marks	L4	CO1	PO1 PO2 PO4 PO5
		(OR)				
2.	a)	Define momentum thickness and energy thickness and explain the characteristics of boundary layer with a neat sketch.	6 Marks	L2	CO1	PO1 PO10
	b)	Discuss different types of boundary layer thickness. The velocity distribution in the boundary layer is given by $u/U = y/\delta$, where u is the velocity at a distance y from the plate and $u = U$ at $y = \delta$, δ being boundary layer thickness. Find the displacement, momentum and energy thickness.	6 Marks	L4	CO1	PO1 PO2 PO4 PO10

UNIT-II

3.	a)	Classify the types of flow in channels and explain in detail.	6 Marks	L4	CO2	PO1 PO2 PO10
	b)	How the flows are classified under specific energy concept and find the discharge through a rectangular channel of width 2 m, having a bed slope of 4 in 8000? The depth of flow is 1.5 m. Use Chezy's formula, Take C = 76.	6 Marks	L6	CO2	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO10
		(OR)				
4.	a)	Determine the most economical section of rectangular channel carrying water at the rate of 0.6 cumecs. The bed slope of the channel is 1 in 2000. Assume Chezy's constant C=50.	6 Marks	L6	CO2	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO10
	b)	Find the rate of flow and conveyance for a rectangular channel 7.5 m wide for uniform flow at a depth of 2.25 m. The channel is having bed slope as 1 in 1000. Take Chezy's constant C = 55.	6 Marks	L6	CO2	PO1 PO2 PO3

		Also state whether the flow is tranquil or rapid.				PO4 PO5 PO6 PO7 PO10
		UNIT-III				
5.	a)	Derive an expression for force exerted by the jet on the stationary plate: i) When flat plate is held normal to the jet; ii) When flat plate is held inclined to the jet; iii) When plate is curved.	6 Marks	L4	CO3	PO1 PO2 PO4 PO10
	b)	A jet of water strikes with a velocity of 35 m/s a flat plate inclined at 30° with the axis of the jet. If the cross-sectional area of the jet is 25 cm^2, determine: i) The force exerted by the jet on the plate. ii) The components of the force in the direction normal to the jet. iii) The ratio in which the discharge gets divided after striking the plate.	6 Marks	L4	CO3	PO1 PO2 PO4 PO6 PO10
		(OR)				
6.	a)	Derive an expression for impact of jet on a fixed curved plate. A jet of water 5 cm in diameter and moving with a velocity of 15 m/s impinges on a series of vanes moving with a velocity of 5 m/s. Determine force on the plates, work done per second and efficiency of the jet.	6 Marks	L4	CO3	PO1 PO2 PO4 PO6 PO10
	b)	A jet of water, 60 mm in diameter, strikes a curved vane at its centre with a velocity of 18 m/s. The curved vane is moving with a velocity of 6 m/s in the direction of the jet. The jet is deflected through an angle of 165°. Assuming the plate to be smooth, find: i) Thrust on the plate in the direction of jet, ii) Power of the jet, and. iii) Efficiency of the jet.	6 Marks	L4	CO3	PO1 PO2 PO4 PO6 PO10
		UNIT-IV				
7.	a)	A Pelton wheel is to be designed for the following specifications: Power (brake or shaft) = 9560 kW Head =350 meters Speed = 750 r.p.m. Overall efficiency = 85% Jet diameter = not to exceed $1/6^{th}$ of the wheel diameter Determine the following: i) The wheel diameter, ii) Diameter of the jet, and iii) The number of jets required. Take C_v = 0·985, Speed ratio = 0.45.	6 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO10
	b)	i) Classify the turbines based on a) Action of water on turbine blades. b) Head on turbine. c) Direction of flow through turbine runner. d) Specific speed. e) Disposition of turbines shaft. ii) Distinguish between impulse turbine and reaction turbine	6 Marks	L4	CO4	PO1 PO2 PO10

(OR)

8.	a)	The water available for a Pelton wheel is 4 m^3/s and the total head from the reservoir to the nozzle is 250 m. The turbine has two runners with two jets per runner. All the four jets have the same diameters. The pipe is 3 km long. The efficiency of transmission through the pipeline and the nozzle is 91% and efficiency of each runner is 90%. The velocity co-efficient of each nozzle is 0·975 and co-efficient of friction '4f' for the pipe is 0·0045. Determine: i) The power developed by the turbine, ii) The diameter of the jet, and iii) The diameter of the pipeline.	6 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO10
	b)	A kaplan turbine is to be designed to develop 9100 kW. The net available head is 5.6 m. The speed ratio is 2.09 and the flow ratio is 0.68. The overall efficiency is 86% and the diameter of the boss is one-third the diameter of the runner. Examine i) Diameter of the runner ii) Speed iii) Specific speed of the turbine	6 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO10

UNIT-V

9.	a)	Mention the main parts of centrifugal pump. A centrifugal pump having outer diameter equal to two times the inner diameter and running at 1000 rpm works against a total head of 40 m. The velocity of flow through the impeller is constant and equal to 2.5 m/s. The vanes are set back at an angle of 40 degrees at outlet. If the outer diameter of the impeller is 500 mm and width at outlet is 50 mm. Calculate the following: i) Vane angle at inlet. ii) Work done by impeller on water per second. iii) Manometric efficiency.	6 Marks	L6	CO5	PO1 PO2 PO3 PO4 PO6 PO10
	b)	What do you mean by multistage pump and when two geometrically similar pumps are running at the same speed of 1000 rpm. One pump has an impeller diameter of 300 mm and lifts water at the rate of 0.02 cumec against a head of 15 m. Determine the head and impeller diameter of the other pump to deliver half the discharge.	6 Marks	L6	CO5	PO1 PO2 PO3 PO4 PO5 PO6 PO10

(OR)

10.	a)	The impeller of a centrifugal pump is 1.45 m diameter and discharges 2 cumec against a head of 6.5 m. The vane angle at the outlet is 145 degrees to the direction of motion. Speed of impeller is 200 rpm. The radial velocity of flow at outlet is 3.6 m/s. Find the manometric efficiency and minimum speed to start the pump. Assume suitable data required.	6 Marks	L4	CO5	PO1 PO2 PO4 PO6 PO10
	b)	Write the components of reciprocating pump with a neat sketch and explain concept of pumps in parallel and series.	6 Marks	L2	CO5	PO1 PO10

CODE No.: 19BT40105 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

STRUCTURAL ANALYSIS

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	A beam AB of length 'l' is supported at the ends carries a point load 'W' at a distance 'a' from the left end and 'b' from the right end. Determine the deflection under the load.	6 Marks	L4	CO1	PO1 PO2 PO10
	b)	A cantilever beam of span 4 m carries a point load 'w' at its free end. The moment of inertia of the section is 8500 cm^4. If the deflection at the free end is not to exceed 0.75 cm, what must be the value of W? Take E = 210 GN/m^2.	6 Marks	L4	CO1	PO1 PO2 PO4 PO10
		(OR)				
2.		A steel girder of uniform section, 14 m long is simply supported at its ends. It carries concentrated loads of 90 kN and 60 kN at two points 3 meters and 4.5 meters from the two ends respectively. Calculate: i) The deflection of the girder at the two points under the loads. ii) The maximum deflection.	12 Marks	L4	CO1	PO1 PO2 PO4 PO10

UNIT-II

3.	a)	Derive the expression for strain energy due to bending moment.	6 Marks	L4	CO1	PO1 PO2 PO10
	b)	Determine the deflection under 60 kN load in the beam shown in Fig.1.	6 Marks	L4	CO1	PO1 PO2 PO4 PO10

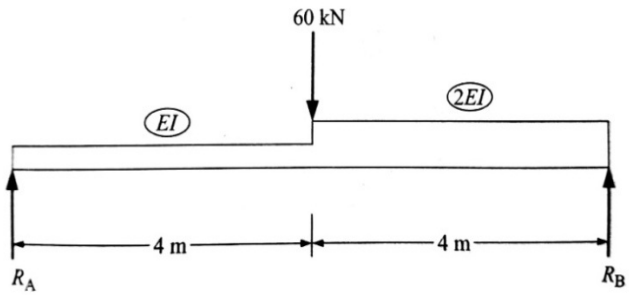


Fig.1

(OR)

4.		Analyze a fixed beam AB of span 'l' carrying a point load W at the mid-span. Draw the shear force and bending moment diagrams.	12 Marks	L4	CO2	PO1 PO2 PO10

UNIT-III

5.	A continuous beam of uniform cross – section is loaded as shown in the Fig.2. Find the following: i) Moments at the supports. ii) Reactions at the supports. iii) Points of contra flexure.	12 Marks	L4	CO3	PO1 PO2 PO4 PO10

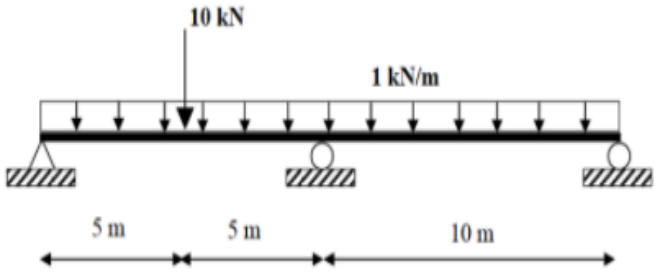


Fig.2

(OR)

6.	Analyze the two-span continuous beam shown in Fig.3 by slope deflection method and draw the bending moment and shear force diagrams. Assume EI is constant throughout.	12 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO10

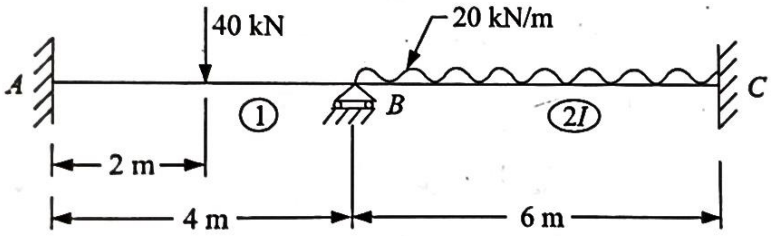


Fig.3

UNIT-IV

7.	Analyse the continuous beam shown in Fig.4 by moment distribution method and draw the bending moment and shear force diagram.	12 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO10

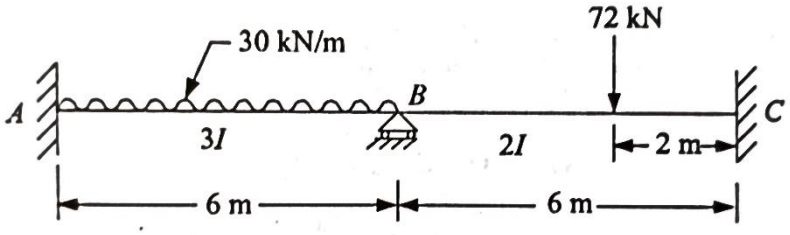


Fig.4

(OR)

8.	Analyze the continuous beam shown in Fig.5 by Kani's method.	12 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO10

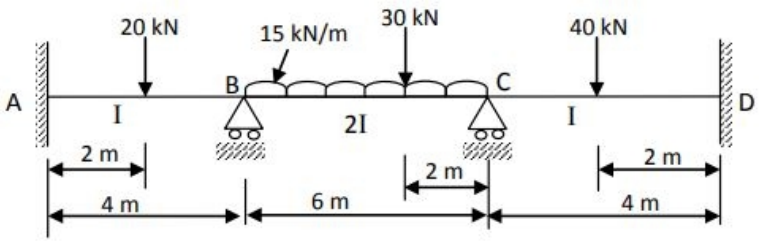


Fig.5

UNIT-V

9.	a)	A single point load of 80 kN crosses a girder of 12 m span. Using influence lines, find the maximum positive and negative shear forces at a point 4 m from the left end.	6 Marks	L4	CO4	PO1 PO2 PO4 PO10
	b)	A uniformly distributed load of 500 kN/m longer than the span, rolls over a beam of span 25 m. Using influence lines determine the maximum bending moment at a section 10 m from the left end.	6 Marks	L4	CO4	PO1 PO2 PO4 PO10
		(OR)				
10.		A T-section consists of a flange 150x10mm and a web of 140x10mm. The section modulus of the T-section is 54600mm^3 This section is used as a simply supported beam of 4m span and carries a UDL of 25kN/m on the whole span. Determine the shape factor of the beam and also calculate the collapse load for the beam. Assume yield stress as 250 Mpa.	12 Marks	L4	CO5	PO1 PO2 PO4 PO6 PO10

CODE No.: 19BT40201 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

DIGITAL ELECTRONICS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the properties of EX-OR gate.	4 Marks	L1	CO1	PO1
	b)	Prove the following using Boolean algebra. i) y'z' + w'x'z' + w'xyz' + wyz' = z' ii) ABC + A'B'C + A'BC +ABC' + A'B'C' = A'B' + B(A + C).	8 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Simplify the Boolean function using K-map in SOP and POS forms F=∑m(0,1,2,4,7,8,12,14,15,16,17,18,20,24,28,30,31)	6 Marks	L2	CO1	PO5
	b)	Implement the following logical expression using AND-OR-INVERTER gates and also using only NOR gates for a digital data processing application. F= A + BC'(D' + BE').	6 Marks	L3	CO1	PO5

UNIT-II

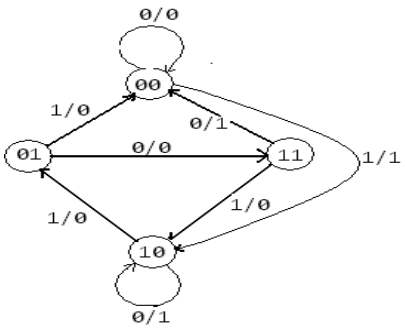
3.	a)	Illustrate three bit magnitude comparator with an example.	6 Marks	L2	CO2	PO2
	b)	Construct a 16×1 multiplexer with two 8×1 and one 2×1 multiplexers using block diagram representation.	6 Marks	L3	CO2	PO4
		(OR)				
4.	a)	Demonstrate a Half adder. Design a full adder circuit optimally using two half adder circuits.	6 Marks	L3	CO2	PO3
	b)	Implement the Boolean function F(A,B,C,D)=∑m(0,1,3,4,8,9,15) using 4:1 Mux.	6 Marks	L3	CO2	PO5

UNIT-III

5.	a)	Describe race-around problem in JK Flip-flop. Explain how it is eliminated in Master slave JK Flip –Flop.	6 Marks	L2	CO3	PO2
	b)	Design Mod-10 Counter using T Flip-Flops.	6 Marks	L3	CO3	PO3
		(OR)				
6.	a)	Illustrate and explain a 3-bit Johnson counter.	6 Marks	L2	CO3	PO1
	b)	Design a 3-bit synchronous UP/DOWN counter using D-flip-flops	6 Marks	L3	CO3	PO3

UNIT-IV

7.	a)	A sequential circuit has one input and one output. The state diagram is shown in below figure. Design the sequential circuit with (i)SR Flip-Flop (ii) D Flip-Flop	8 Marks	L2	CO4	PO5



b)	Realize a Logic function using F (A, B, C) = Σ_m (2,4,5,6) using Hazard Free logic gate network.	4 Marks	L2	CO4	PO5

(OR)

8.	Explain the procedure of state minimization for state table given below using the merger graph.	12 Marks	L2	CO4	PO5

Present state	Next state, Z			
	I_1	I_2	I_3	I_4
A	-	C,1	E,1	B,1
B	E,0	-	-	-
C	F,0	F,1	-	-
D	-	-	B,1	-
E	-	F,0	A,0	B,1
F	C,0	-	B,0	C,1

UNIT-V

9.	Tabulate the PLA programming table for the four Boolean functions listed below. Minimize the number of product terms. A(x, y, z) = Σ(1,2,4,6) B(x, y, z) = Σ(0,1,6,7) C(x, y, z) = Σ(2,6) D(x, y, z) = Σ(1,2,35,7)	12 Marks	L2	CO5	PO2

(OR)

10.	Show the step-by-step multiplication process using Booth algorithm for +15 and -13 which are binary. Assume 5-bit registers that hold signed numbers. The multiplicand is +15 and the multiplier is -13.	12 Marks	L3	CO5	PO2

CODE No.: 19BT40301 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December - 2022

DYNAMICS OF MACHINERY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		A dry single plate clutch is to be designed for an automotive vehicle whose engine is rated to give 100 kW at 2400 r.p.m. and maximum torque 500 N-m. The outer radius of friction plate is 25% more than the inner radius. The intensity of pressure between the plate is not to exceed 0.07 N/mm^2. The coefficient of friction may be assumed equal to 0.3. The helical springs required by this clutch to provide axial force necessary to engage the clutch are eight. If each spring has stiffness equal to 40 N /mm, determine the initial compression in the springs and dimensions of the friction plate.	12 Marks	L3	CO1	PO1 PO2 PO3
		(OR)				
2.	a)	List various types of brakes and what is the self locking of brake?	4 Marks	L1	CO1	PO1
	b)	Write a short note on absorption brake dynamometers with neat sketches.	8 Marks	L2	CO1	PO1 PO2

UNIT-II

3.		A ship propelled by a turbine rotor which has a mass of 5 tonnes and a speed of 2100 r.p.m. The rotor has a radius of gyration of 0.5 m and rotates in a clockwise direction when viewed from the stern. Find the gyroscopic effects in the following conditions: 1. The ship sails at a speed of 30 km/h and steers to the left in a curve having 60 m radius. 2. The ship pitches 6 degree above and 6 degree below the horizontal position. The bow is descending with its maximum velocity. The motion due to pitching is simple harmonic and the periodic time is 20 seconds. 3. The ship rolls and at a certain instant it has an angular velocity of 0.03 rad/s clockwise when viewed from stern. Determine also the maximum angular acceleration during pitching. Explain how the direction of motion due to gyroscopic effect is determined in each case.	12 Marks	L3	CO2	PO1 PO2 PO3 PO4
		(OR)				
4.		The turning moment curve for an engine is represented by the equation, T = (20 000 + 9500 sin 2θ – 5700 cos 2θ) N-m, where θ is the angle moved by the crank from inner dead centre. If the resisting torque is constant, find: 1. Power developed by the engine ; 2. Moment of inertia of flywheel in kg-m2 , if the total fluctuation of speed is not exceed 1% of mean speed which is 180 r.p.m; and 3. Angular acceleration of the flywheel when the crank has turned through 45° from inner dead centre.	12 Marks	L3	CO3	PO1 PO2 PO3

UNIT-III

5.		In a spring loaded governor of the Hartnell type, the mass of each ball is 1kg, length of vertical arm of the bell crank lever is 100 mm and that of the horizontal arm is 50 mm. The distance of fulcrum of each bell crank lever is 80 mm from the axis of rotation of the governor. The extreme radii of rotation of the balls are 75 mm and 112.5mm. The maximum equilibrium speed is 5 per cent greater than the minimum equilibrium speed which is 360 r.p.m. Find, neglecting obliquity of arms, initial compression of the spring and equilibrium speed corresponding to the radius of rotation of 100 mm.	12 Marks	L3	CO4	PO1 PO2 PO3 PO4

(OR)

6.		The upper arms of a Porter governor has lengths 350 mm and are pivoted on the axis of rotation. The lower arms has lengths 300 mm and are attached to the sleeve at a distance of 40 mm from the axis. Each ball has a mass of 4 kg and mass on the sleeve is 45 kg. Determine the equilibrium speed for a radius of rotation of 200 mm and find also the effort and power of the governor for 1 per cent speed change.	12 Marks	L2	CO4	PO1 PO2 PO3 PO4

UNIT-IV

7.	a)	Write the importance of balancing?	4 Marks	L1	CO5	PO1
	b)	A shaft carries four masses in parallel planes A, B, C and D in this order along its length. The masses at B and C are 18 kg and 12.5 kg respectively, and each has an eccentricity of 60 mm. The masses at A and D have an eccentricity of 80 mm. The angle between the masses at B and C is 100° and that between the masses at B and A is 190°, both being measured in the same direction. The axial distance between the planes A and B is 100 mm and that between B and C is 200 mm. If the shaft is in complete dynamic balance, Determine : i) The magnitude of the masses at A and D ; ii) the distance between planes A and D ; and iii) the angular position of the mass at D.	8 Marks	L3	CO5	PO1 PO2 PO3 PO6

(OR)

8.	a)	Explain the terms Variation of Tractive Force, Swaying Couple, Hammer Blow.	4 Marks	L2	CO5	PO1 PO2
	b)	The following data refer to two cylinder locomotive with cranks at 90°: Reciprocating mass per cylinder = 300 kg ; Crank radius = 0.3 m ; Driving wheel diameter = 1.8 m ; Distance between cylinder centre lines = 0.65 m ; Distance between the driving wheel central planes = 1.55 m. Determine : i) The fraction of the reciprocating masses to be balanced, if the hammer blow is not to exceed N at 96.5 km. p.h. ; ii) The variation in tractive effort; and iii) The maximum swaying couple.	8 Marks	L3	CO5	PO1 PO2 PO3

UNIT-V

9.	a)	What are the causes and effects of vibrations?	4 Marks	L2	CO6	PO1
	b)	Establish an expression for the natural frequency of free transverse vibrations for a simply supported beam carrying a number of point loads, by Dunkerley's method.	8 Marks	L2	CO6	PO1 PO2 PO3
		(OR)				
10.	a)	Explain about the Magnification Factor in forced vibration.	4 Marks	L2	CO6	PO1 PO2
	b)	With neat sketch explain the Free Torsional Vibrations of a Three Rotor System, and deduce the equation for Torsionally Equivalent Shaft.	8 Marks	L2	CO6	PO1 PO2

CODE No.: 19BT40302 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

ENGINEERING METROLOGY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Differentiate between line standards and end standards.	6 Marks	L 2	CO1	PO1 PO2
	b)	Distinguish between Hole basis system and Shaft basis system	6 Marks	L1	CO1	PO1 PO2
		(OR)				
2.		Compare and contrast between Interchangeability and Selective assembly with illustrative examples.	12 Marks	L 2	CO1	PO1 PO2
		UNIT-II				
3.		With the help of neat sketches, explain how a sine bar is used to determine the taper angle of an inclined surface? Name the various factors affecting the accuracy of the sine bar.	12 Marks	L 2	CO2	PO1 PO2
		(OR)				
4.	a)	Sketch and explain the working principle of sigma comparator.	6 Marks	L2	CO2	PO1
	b)	Write a short notes on angle gauges.	6 Marks	L2	CO2	PO1
		UNIT-III				
5.		The heights of peaks and valleys of 20 successive points on a surface are 80,60, 88, 66, 78, 62, 80, 62, 81, 63, 83, 62, 80, 60, 80, 60, 81, 59, 82, 62 microns respectively, measured over a length 20 mm, Determine CLA and RMS values of roughness surface.	12 Marks	L3	CO3	PO1 PO2 PO3
		(OR)				
6.		What is the principle of an Optical flat? Explain the procedure of performing flatness test using optical flat.	12 Marks	L2	CO3	PO2
		UNIT-IV				
7.		Explain the two wire method for finding effective diameter of screw threads and derive for best wire size.	12 Marks	L2	CO4	PO1
		(OR)				
8.		Sketch and explain the important parameters involved in gear measurement. Explain the working principle of any one gear measuring instrument.	12 Marks	L3	CO4	PO1 PO2
		UNIT-V				
9.		Define Strain Rosette .Sketch and explain the various types of strain gauges for different applications.	12 Marks	L1	CO5	PO1 PO2
		(OR)				
10.	a)	Explain working principle of Radiation Pyrometer.	6 Marks	L2	CO5	PO1
	b)	Explain with a neat sketch the working principle of dead weight pressure gauge.	6 Marks	L2	CO5	PO1

CODE No.: 19BT40303 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

FLUID MECHANICS AND HYDRAULIC MACHINERY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define viscosity and write down the units. And write down different types of fluids.	6 Marks	L1	CO1	PO1
	b)	A plate 0.025 mm distance from a fixed plate, moves at 60 cm/sec and requires a force of 2 N per unit area i.e., 2 N/m^2 to maintain this speed. Determine the fluid viscosity between the plates.	6 Marks	L2	CO1	PO1 PO2
		(OR)				
2.		At the right limb of a simple differential manometer containing the mercury is open to the atmosphere while the left limb is connected to a pipe in which a fluid of specific gravity 0.9 is flowing. The centre of the pipe is 12cm below the level of mercury in the right limb. Find the pressure of fluid in the pipe if the difference of mercury level in the two limbs is 20 cm.	12 Marks	L3	CO1	PO1 PO2

UNIT-II

3.		Define the equation of continuity. Obtain an expression for continuity equation for three dimensional flows in Cartesian coordinates.	12 Marks	L2	CO2	PO1
		(OR)				
4.		Derive an expression for the discharge through venturimeter.	12 Marks	L3	CO2	PO1

UNIT-III

5.		Define boundary layer and explain the fundamental causes of its existence.	12 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Outline the minor energy losses in pipes.	6 Marks	L1	CO3	PO1
	b)	The difference in water surface levels in two tanks, which are connected by three pipes in series of lengths 300 m, 170 m and 210 m and of diameters 300 mm, 200 mm and 400 mm respectively, is 12 m. determine the rate of flow of water if co-efficient of friction are 0.005, 0.0052 and 0.0048 respectively, considering: i) Minor losses also ii) Neglecting minor losses	6 Marks	L3	CO3	PO1 PO2 PO3

UNIT-IV

7.		Derive an expression for the force exerted by a jet of water on stationary flat vertical and inclined plates.	12 Marks	L3	CO4	PO1 PO2
		(OR)				

8.		Define the specific speed of a turbine? Derive an expression for the specific speed. What is the significance of the specific speed?	12 Marks	L3	CO4	PO1 PO2 PO3

UNIT-V

9.	a)	What do you mean by manometric efficiency, mechanical efficiency and overall efficiency of centrifugal pump?	6 Marks	L1	CO5	PO1
	b)	What is negative slip in a reciprocating pump? Explain with neat sketches the functions of air vessels in a reciprocating pump.	6 Marks	L2	CO5	PO1
		(OR)				
10.		A double acting reciprocating pump, running at 50 r.p.m. is discharging 900 litres of water per minute. The pump has stroke of 400 mm. The diameter of piston is 250 mm. The delivery and suction head are 25 m and 4 m respectively. Find the slip of the pump and power required to drive the pump.	12 Marks	L2	CO5	PO1 PO2 PO3

CODE No.: 19BT40304 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

METAL CUTTING AND MACHINE TOOLS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Discuss the principle and requirement of machining.	6 Marks	L2	CO1	PO1
	b)	Explain the geometry of twist drill and milling cutter.	6 Marks	L2	CO1	PO1 PO2
		(OR)				
2.		Analyze the nomenclature of ORS and NRS system with diagram.	12 Marks	L2	CO1	PO1 PO2
		UNIT-II				
3.	a)	Write short notes on shear strain and cutting forces with diagram.	6 Marks	L1	CO2	PO1 PO7
	b)	Define chips and recall the types of chips.	6 Marks	L1	CO2	PO1 PO7
		(OR)				
4.		Derive the expression for the various cutting forces using Merchant's circle diagram.	12 Marks	L3	CO2	PO1 PO2 PO3 PO7
		UNIT-III				
5.	a)	Differentiate work and tool holding devices in lathe.	6 Marks	L2	CO3	PO1 PO2 PO3
	b)	Write short notes on single-spindle and multi-spindle automatic lathes.	6 Marks	L1	CO3	PO1 PO2
		(OR)				
6.		Draw and explain the various operations performed on Lathe with neat diagrams.	12 Marks	L2	CO3	PO1 PO7
		UNIT-IV				
7.	a)	Compare slotting and drilling machines.	6 Marks	L2	CO4	PO1 PO7
	b)	List the specifications and types of drilling machine.	6 Marks	L1	CO4	PO1 PO7
		(OR)				
8.		What is boring? Explain the working principle of jig boring machine with neat diagram.	12 Marks	L2	CO4	PO1 PO2 PO7
		UNIT-V				
9.	a)	Write a brief note on grinding, lapping and honing in grinding machine.	6 Marks	L1	CO5	PO1 PO2 PO7
	b)	Discuss on working principle and operations in grinding machine with neat diagram.	6 Marks	L2	CO5	PO1
		(OR)				
10		Define milling and explain the methods of indexing used in	12 Marks	L2	CO6	PO1

. milling machine. PO7

CODE No.: 19BT40305 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

THERMAL ENGINEERING-I

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the time loss factor, heat loss factor and exhaust blow down losses.	6 Marks	L2	CO1	PO1
	b)	Explain the stages of combustion in SI engine with neat sketch.	6 Marks	L2	CO1	PO1 PO2
		(OR)				
2.	a)	Compare the relative advantages and disadvantages of four stroke and two stroke engines.	6 Marks	L2	CO1	PO1 PO2
	b)	List the important internal combustion engine parts and explain in detail.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	List out the Methods of obtaining Friction Power and explain any one of them in detail.	6 Marks	L2	CO1	PO1
	b)	In a laboratory experiment, the following observations were noted during the test of a four-stroke diesel engine. Area of the indicator diagram = 420mm Length of the indicator diagram = 62mm^2 Spring number = 1.1bar/min Diameter of the piston = 100mm Length of stroke = 150mm Engine speed = 450rpm Determine: i) Indicated mean effective pressure. ii) Indicated power.	6 Marks	L3	CO1	PO1 PO2 PO3
		(OR)				
4.	a)	The cubic capacity of 4 stroke over square SI Engine is 245cc. The over square ratio is 1.1. The clearance volume is 27.2cc. calculate the bore, stroke and compression ratio of the engine.	6 Marks	L3	CO1	PO1 PO2 PO3
	b)	Explain the significance of the following tests: i) Motoring test. ii) Morse test. iii) Retardation test.	6 Marks	L2	CO1	PO1
		UNIT-III				
5.		In a constant pressure open cycle gas turbine air enters at 1 bar and 20^{0}C and leaves the compressor at 5 bar. Using the following data: temperature of the gases entering the turbine = 680^{0}C, pressure loss in the combustion chamber = 0.1 bar, $\eta_{compressor}$ = 85%, $\eta_{turbine}$ = 80%, $\eta_{combustion}$ = 85%, γ =1.4, C_p=1.024kJ/kg K for air and gas. Find: i) the quality of air circulation if the plant develops 1065kW ii) Heat supplied per kg of circulation iii) Thermal efficiency of the cycle. Mass of fuel may be neglected.	12 Marks	L3	CO2	PO1 PO2 PO3
		(OR)				

6.	a)	Distinguish between rocket propulsion Engine and turbojet Engines.	6 Marks	L4	CO2	PO1
	b)	Explain the working of turbo jet engine with a neat sketch.	6 Marks	L2	CO2	PO1
		UNIT-IV				
7.	a)	Derive an expression for the work done by single stage single acting reciprocating air compressor.	6 Marks	L3	CO3	PO1 PO2
	b)	A three stage single acting reciprocating air compressor delivers 2.5 m^3 of free air per minute from 1 bar to 72 bar. Calculate the power required to operate compressor if n = 1.3. The mean piston speed is 140 m/min. Find the piston area, neglecting the clearance volume.	6 Marks	L3	CO3	PO1 PO2 PO3
		(OR)				
8.	a)	Explain the working principle of roots blower with a neat sketch.	6 Marks	L3	CO3	PO1
	b)	Classify air compressors and explain two stage reciprocating air compressor.	6 Marks	L2	CO3	PO1
		UNIT-V				
9.	a)	In a Rankine cycle the steam at inlet to the turbine is saturated at a pressure of 20 bar and exhaust pressure is 0.04 bar. Determine: i) Pump work. ii) Turbine Power. iii) Rankine efficiency. Assume the flow rate of steam as 10 kg/sec.	6 Marks	L3	CO4	PO1 PO2 PO3
	b)	Explain the working of binary vapor power cycle with suitable diagram.	6 Marks	L2	CO4	PO1
		(OR)				
10.	a)	Compare the efficiency of the Modified Rankine cycle with respect to Rankine cycle. Also obtain the expression for efficiency of Modified Rankine cycle.	6 Marks	L4	CO4	PO1 PO2
	b)	A basic steam power plant works on ideal Rankine cycle between 30 bar and 0.04 bar. The initial condition of steam being 0.8 dry and flow rate 10 kg/s determine: i) Work required for pumping ii) work done by the turbine iii) cycle efficiency.	6 Marks	L3	CO4	PO1 PO2 PO3

❀ ❀ ❀

CODE No.: 19BT40401 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

ANALOG COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	With a neat block diagram, explain the working of FDM technique.	6 Marks	L2	CO1	PO2
	b)	Discuss the appropriate amplitude modulation technique which requires modulated band width equal to the twice of message signal band width and more power consumption.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Draw the circuit of a balanced modulator. Give the mathematical analysis to explain how and why only the carrier is suppressed in a balanced modulator.	6 Marks	L2	CO1	PO2
	b)	With neat block diagram, explain the generation of SSB wave by phase discrimination method.	6 Marks	L3	CO1	PO2
		UNIT-II				
3.	a)	Derive the expression for NBFM if message is m(t) and carrier is $A_c Cos\omega_c t$. Draw the corresponding phasor diagram of NBFM and compare it with AM wave.	6 Marks	L1	CO1	PO2
	b)	An FM wave is defined by s(t)=10 cos(2+sin (6Πt). Find the instantaneous frequency of s(t).	6 Marks	L2	CO1	PO4
		(OR)				
4.	a)	Explain FM generation using direct method.	6 Marks	L4	CO1	PO1
	b)	An FM wave is defined by s(t)=10 cos (2 +sin (6πt)). Find the instantaneous frequency S(t).	6 Marks	L2	CO1	PO2
		UNIT-III				
5.	a)	Prove that narrow band FM offers no improvement in SNR over AM.	6 Marks	L4	CO2	PO2
	b)	An AM receiver operates with a tone modulation, and the modulation index ma=0.6. The message signal is 60 Sin (5000Πt). Calculate the output SNR relative to the baseband performance.	6 Marks	L4	CO2	PO2
		(OR)				
6.	a)	Discuss the role of pre-emphasis and de-emphasis in the improvement of noise immunity in FM.	6 Marks	L4	CO2	PO2
	b)	Prove that the figure of merit of AM system for single stone modulation with 100% modulation is 1/3.	6 Marks	L1	CO2	PO1
		UNIT-IV				
7.	a)	In a superhetrodyne receiver with no RF section, the 'Q' of the antenna coupling circuit is found to be 110. Calculate the image frequency and its rejection ratio at 1100 kHz.	6 Marks	L1	CO3	PO3
	b)	An FM radio link has a frequency deviation of 25 kHz. The	6 Marks	L1	CO3	PO4

		modulating frequency is 5 kHz. Calculate the bandwidth needed for the link. What will be the bandwidth if the deviation is reduced to 10 kHz?				
		(OR)				
8.	a)	Compare low level modulation and high level modulation of radio transmitters.	6 Marks	L4	CO3	PO2
	b)	For an FM modulator with a modulating signal m(t)= Vm sin300wt, the carrier Signal Vc(t)=8 sin(6.5×106)t and the modulator index β = 2. Find out the significant side frequencies and their amplitudes.	6 Marks	L1	CO3	PO3
		UNIT-V				
9.	a)	Discuss the performance analysis of pulse modulation schemes.	6 Marks	L1	CO4	PO1
	b)	Draw the wave forms of pulse modulations and explain briefly.	6 Marks	L3	CO4	PO2
		(OR)				
10.	a)	Explain how a PPM signal can be generated from a PWM signal?	6 Marks	L1	CO4	PO1
	b)	Define and distinguish between PTM and PAM schemes. Sketch and explain their waveform for a single tone sinusoidal input signal.	6 Marks	L2	CO4	PO1

CODE No.: 19BT40402 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

ELECTRONIC CIRCUIT ANALYSIS AND DESIGN

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Design Two stage RC coupled amplifier to meet the following specifications Av = 400, S=3, Vcc=12V, Ic=1mA, f_L =50Hz and Rs =500Ω. Assume data wherever necessary.	12 Marks	L6	CO1	PO3
		(OR)				
2.	a)	Recall the circuit diagram of a two-stage RC coupled amplifier and draw its frequency response.	6 Marks	L1	CO1	PO6
	b)	Explain the following terms with respect to the frequency response of an amplifier: i) Mid frequency region ii) Cutoff frequency iii) Band width	6 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Explain briefly about the small signal equivalent circuit of an emitter follower at high frequency.	6 Marks	L2	CO2	PO1
	b)	Define f_β and f_T. Develop the relation between f_β and f_T.	6 Marks	L1	CO2	PO1
		(OR)				
4.	a)	Construct an expressions for hybrid-π resistances r_{ce} and $r_{bb'}$ of a transistor.	6 Marks	L3	CO2	PO2
	b)	A transistor amplifier in CE configuration is operated at High frequency with the following specifications fT= 6 M Hz; gm = 0.04; hfe = 50; rbb'= 100 ohm ; Rs= 500 ohm; Cb'c = 120pf; RL = 100ohm. Estimate the Voltage gain, upper 3dB frequency and gain bandwidth product.	6 Marks	L5	CO2	PO2

UNIT-III

5.	a)	State the necessity of feedback in amplifiers and explain the effect of feedback on: i) Distortion ii) Noise iii) Bandwidth iv) Gain	8 Marks	L2	CO3	PO1
	b)	The gain (A_f) of an amplifier with feedback is to be nominally 20, and a variation of 5% is permissible. If the magnitude of the return ratio (Aβ) must be at least 1000(so that Aβ >>1), then determine the minimum valve of the open loop gain (A) and the maximum permissible variation in it.	4 Marks	L4	CO3	PO2
		(OR)				

6.	a)	Formulate current series feedback amplifier input and output resistance with and without feedback.	6 Marks	L2	CO3	PO2
	b)	An amplifier has voltage gain of 10,000 with ground plate supply of 150V and voltage gain of 8000 at reduced rate supply of 130V. On application of negative feedback the voltage gain at normal plate supply is reduced by a factor of 80. Calculate the i) Voltage gain of the amplifier with feedback for two valves of plate supply voltage. ii) Percentage reduction in voltage gain with reduction in plate supply voltage for both conditions, with and without feedback.	6 Marks	L3	CO3	PO2

UNIT-IV

7.	a)	Explain principle and operation of the Wien Bridge Oscillator and derive expression for frequency of oscillation.	8 Marks	L2	CO3	PO1
	b)	Compare RC and LC oscillators.	4 Marks	L5	CO3	PO2
		(OR)				
8.	a)	State the Barkhausen's criterion for oscillations.	5 Marks	L1	CO3	PO1
	b)	A Hartley oscillator is designed with L1= 20 μH; L2= 2 mH. Determine range of capacitances if frequency is varied between 950 KHz and 2050 kHz.	7 Marks	L3	CO3	PO2

UNIT-V

9.	a)	Explain in detail about the operation of class S power amplifier.	6 Marks	L3	CO5	PO1
	b)	Write the advantages and disadvantages of Transformer coupled Class-A amplifier.	6 Marks	L2	CO5	PO2
		(OR)				
10.	a)	Derive the equation for 3-dB bandwidth of Single tuned amplifier.	6 Marks	L3	CO5	PO2
	b)	A tuned circuit has resonance frequency of 800 KHz and a band width of 10 KHz. What is the value of its Q-factor?	6 Marks	L1	CO5	PO4

CODE No.: 19BT40403 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

LINEAR AND DIGITAL IC APPLICATIONS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Design a square waveform generator of frequency 100Hz and duty cycle of 70% using a 555 timer.	6 Marks	L3	CO1	PO3
	b)	Design a 555 timer based square wave generator to produce a symmetrical square wave of 2 kHz, if V_{cc}=12V, draw the voltage across timing capacitor and output.	6 Marks	L3	CO1	PO6
		(OR)				
2.	a)	Prove that an Op amp can be used to find the log of a given analog signal.	6 Marks	L2	CO1	PO2
	b)	Draw the block diagram of IC566 VCO and explain its operation.	6 Marks	L1	CO1	PO1

UNIT-II

3.	a)	Explain in brief the principle of operation of Flash type ADC.	6 Marks	L1	CO3	PO1
	b)	Explain the operation of a Dual-slope ADC and analyze it with flash type ADC.	6 Marks	L1	CO3	PO2
		(OR)				
4.	a)	Explain in brief the principle of operation of successive Approximation ADC.	6 Marks	L1	CO3	PO1
	b)	Design a second order Butterworth high pass filter with cut off frequency of 3 KHz.	6 Marks	L3	CO2	PO8

UNIT-III

5.	a)	What are the basic components of a module? Which components are mandatory in Verilog HDL?	6 Marks	L3	CO4	PO1
	b)	Write 4-to-1 multiplexer using case statement in dataflow modeling.	6 Marks	L3	CO5	PO1
		(OR)				
6.	a)	Illustrate the salient features of data flow design elements.	6 Marks	L1	CO4	PO2
	b)	Explain the sequential and parallel blocks in Verilog HDL with an example.	6 Marks	L1	CO4	PO1

UNIT-IV

7.	a)	Illustrate a 4 to 16 decoder using two 74*138 decoders and write the Verilog HDL code for it.	6 Marks	L3	CO5	PO2
	b)	Explain the importance of IC 74X181 in recent developments of processors.	6 Marks	L1	CO5	PO1
		(OR)				
8.	a)	Sketch the diagram and functional table of a 4-bit comparator and briefly explain about it. Write a Verilog HDL code for it in any modeling.	6 Marks	L2	CO5	PO2
	b)	Write a Verilog code for full adder using two half adders and an OR Gate.	6 Marks	L2	CO5	PO1

UNIT-V

9.	a)	Draw the logic diagram of 74×163 binary counter and explain its operation.	6 Marks	L1	CO5	PO1
	b)	Implement a modulo-11 counter using 74×163 binary counters.	6Marks	L3	CO5	PO4
		(OR)				
10.	a)	Sketch the symbol, functional table & write Verilog HDL source code of 74X194 IC.	6 Marks	L2	CO5	PO6
	b)	Design a 3-bit LFSR counter using 74x194.List out the sequence assuming that the initial state 111.	6 Marks	L3	CO5	PO3

CODE No.: 19BT40404 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

PROBABILITY AND STOCHASTIC PROCESSES

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	State and Prove Bayes theorem.	6 Marks	L2	CO1	PO1
	b)	In the experiment of throwing two fair dice, let ***A*** be the event that the first die is odd, B be the Event that the second die is odd, and C be the event that the sum is odd. Show that events ***A,*** B, and C are pair wise independent, but ***A, B,*** and C are not independent.	6 Marks	L2	CO1	PO4
		(OR)				
2.	a)	Given that P(A), P(B) = 0.8 and P(A ∩ B) = 0.75 Find: $i)\ P(A \cup B)$ $ii)\ P(A \cap B^c)$ $iii)\ P(A^c \cap B^c)$.	6 Marks	L2	CO1	PO4
	b)	Define Joint Probability and Conditional Probability	6 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Let X be a Random Variable with P.D.F a given by $f_x(x) = \begin{cases} 2x & 0 < x < 1 \\ 0 & otherwise \end{cases}$ Find the P.D.F of a random variable Y, if Y=2X+1.	6 Marks	L2	CO2	PO4
	b)	State and prove chebchev's inequality.	6 Marks	L3	CO2	PO2
		(OR)				
4.	a)	Define the following: i) Expected value of a function of a random variable. ii) Moments about the origin. iii) Central moments.	6 Marks	L3	CO2	PO1
	b)	State and prove properties of characteristic function of a random variable X.	6 Marks	L3	CO2	PO2

UNIT-III

5.	a)	The joint cdf of a bivariate random variable. (X, Y) is given by $F(x,y)$ $= \begin{cases} \left(1 - e^{-ax}\right)\left(1 - e^{-by}\right) & X \geq 0, Y \geq 0,\ a > 0, b > 0 \\ 0 & otherwise \end{cases}$ i) Find the marginal CDF's of X and Y. ii) Show that X and Y are independent.	6 Marks	L2	CO2	PO4
	b)	The random variable X and Y have the joint characteristic function. $\phi(w_1, w_2) = \exp(-2W_1^2 - 9W_2^2$. Show that X and Y are both are zero means and that they are uncorrelated.	6Marks	L2	CO2	PO4
		(OR)				
6.	a)	Discuss the Properties of Gaussian Random Variable.	6 Marks	L3	CO2	PO1
	b)	Explain the Linear Transformation of Gaussian Random Variables.	6 Marks	L3	CO2	PO1

UNIT-IV

7.	a)	Given a random process by X(t) = AC0S (πt), where A is Gaussian random variable with zero mean and variance $\sigma \frac{2}{x}$. i) Find the density function of X (0). ii) Is X(t) stationary in any sense.	6 Marks	L3	CO3	PO4
	b)	Distinguish between. i) Deterministic and non-deterministic process. ii) Stationary and non-stationary random process.	6 Marks	L2	CO3	PO2
		(OR)				
8.	a)	Derive the autocorrelation output of LTI system.	6 Marks	L2	CO3	PO2
	b)	Derive the relationship between cross correlation function and cross power spectrum.	6 Marks	L2	CO3	PO2

UNIT-V

9.	a)	Mention the differences between correlated and uncorrelated noise.	6 Marks	L3	CO4	PO1
	b)	Define thermal noise and explain its relationship to the bandwidth and temperature.	6 Marks	L3	CO4	PO1
		(OR)				
10.	a)	Explain the importance of Friss's Formula with the help of example.	6 Marks	L3	CO4	PO1
	b)	Discuss the following terms: i) Noise factor. ii) Noise Figure equivalent noise temperature.	6 Marks	L3	CO4	PO2

CODE No.: 19BT40441 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

ANALOG ELECTRONICS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Apply Bootstrapping Method for a Darlington amplifier to increase input impedance.	6 Marks	L2	CO1	PO6
	b)	Analyze a single stage common emitter amplifier with its equivalent circuit using approximation model.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Analyze the CE short circuit current gain as function of frequency also plots its frequency response.	6 Marks	L1	CO1	PO1
	b)	With the Help of Circuit diagram and its ac equivalent Circuit develop expression for the overall input impedance of the Darlington amplifier.	6 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	Use a Trans-resistance amplifier and prove its input and output impedances are very low compared to CE amplifier.	6 Marks	L2	CO2	PO5
	b)	Explain the method of analysis of feedback amplifier.	6 Marks	L1	CO2	PO1
		(OR)				
4.	a)	Calculate the gain, input impedance and output impedance of voltage series feedback amplifier having gain A = -300, Rin = 1.5 k-ohms and Rout = 50 k-ohms, β= 0.05.	6 Marks	L3	CO2	PO4
	b)	List the general characteristics of negative feedback amplifiers and explain.	6 Marks	L2	CO2	PO2
		UNIT-III				
5.	a)	Explain principle and operation of the RC phaseshift Oscillator using FET and derive expression for frequency of oscillation.	8 Marks	L1	CO2	PO1
	b)	State and explain the Barkhausen's criterion for Oscillations.	4 Marks	L1	CO2	PO1
		(OR)				
6.	a)	For the following parameters calculate the series resonant frequency and Q - factor of the crystal. L = 0.5H, C1 = 0.06pF, Ch = 2.0pF and R = 5KΩ.	6 Marks	L3	CO2	PO4
	b)	Draw the circuit diagram of Hartley oscillator with BJT, explain its operation and derive an expression for frequency of oscillations.	6 Marks	L2	CO2	PO2
		UNIT-IV				
7.	a)	Explain second harmonic distortion in power amplifiers.	6 Marks	L1	CO3	PO1
	b)	Compare push-pull and complementary class B power amplifier.	6 Marks	L3	CO3	PO2
		(OR)				
8.	a)	Design a class B power amplifier to obtain the maximum conversion efficiency is 78.5%.	6 Marks	L4	CO3	PO3
	b)	Select a power amplifier to get power efficiency 50% and explain briefly.	6 Marks	L1	CO3	PO5

UNIT-V

9.	a)	Analyze the first order low pass filter and derive an equation for its gain and also draw its frequency response curve.	6 Marks	L1	CO4	PO2
	b)	Design a high pass filter with a cut-off frequency of 10KHz with a pass band gain of 1.5.	6 Marks	L4	CO4	PO3
		(OR)				
10.	a)	Design monostable multivibrator circuit using 555 timer and describe in detail about its operation.	6 Marks	L4	CO4	PO3
	b)	Explain the applications of astable multivibrator using 555 timer.	6 Marks	L3	CO4	PO1

CODE No.: 19BT40502 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

DATABASE MANAGEMENT SYSTEMS

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Define Data Abstraction and discuss levels of Abstraction.	6 Marks	L1	CO1	PO1
	b)	Discuss about the Concept Design with the ER Model.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Explain different types of database users and write the functions of DBA.	6 Marks	L2	CO1	PO1
	b)	Explain basic notations of ER diagram.	6 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Analyze and find whether View exists if the table is dropped from the database.	6 Marks	L4	CO2	PO3
	b)	Illustrate different set operations in Relational algebra with an example.	6 Marks	L3	CO2	PO3
		(OR)				
4.	a)	Discuss about Complex integrity constraints in SQL.	6 Marks	L2	CO2	PO2
	b)	Explain Relational algebra. i) Write a relational expression to find the names of sailors who have reserved boat 103. ii) Write a relational expression to find the names of sailors who have not reserved a red boat.	6 Marks	L2	CO2	PO2
		UNIT-III				
5.		Define trigger and explain its three parts. Differentiate row level and statement level triggers.	12 Marks	L2	CO3	PO2
		(OR)				
6.	a)	Define a nested query. i) Write a nested query to find the names of sailors who have reserved both a red and green boat. ii) Write a nested query to find the names of sailors who have reserved all boats.	6 Marks	L2	CO3	PO2
	b)	Illustrate PL/SQL control structure with examples.	6 Marks	L2	CO3	PO2
		UNIT-IV				
7.		Compare and contrast BCNF with 3NF.	12 Marks	L4	CO4	PO3
		(OR)				
8.	a)	Illustrate multi-valued dependencies and Fourth normal form with example.	6 Marks	L3	CO4	PO3
	b)	Discuss serializability in detail.	6 Marks	L2	CO4	PO2
		UNIT-V				
9.	a)	Discuss in detail Multiple Granularity.	6 Marks	L2	CO5	PO2
	b)	Demonstrate searching a given element in B+ trees. Explain with example.	6 Marks	L2	CO5	PO2
		(OR)				
10.	a)	Describe Validation-based locking protocols.	6 Marks	L2	CO5	PO2
	b)	Illustrate insertion of an element in B+ trees with example.	6 Marks	L3	CO5	PO3

❀ ❀ ❀

CODE No.: 19BT41001 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

INDUSTRIAL INSTRUMENTATION

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What is the need for viscosity measurement in industries? List some applications, safety issues that may arise due to improper selection of sensor in an industrial environment. Suggest one method of viscosity measurement and explain it.	6 Marks	L3	CO1	PO4
	b)	Describe the construction and working principle Searle's rotating cylinder.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	List the types of humidity. Explain the construction and working principle of Psychrometer with a neat sketch.	6 Marks	L2	CO1	PO1
	b)	Define specific viscosity. Explain the construction and working principle of friction tube viscometer.	6 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Identify an appropriate sensing mechanism for measurement low pressure. Justify your sensor selection and explain how this works with a neat sketch.	6 Marks	L3	CO1	PO4
	b)	What is Absolute pressure? With a neat sketch explain Thermal conductivity Gage.	6 Marks	L1	CO1	PO1
		(OR)				
4.	a)	Differentiate the working principle of McLeod Gage and Ionization gage.	6 Marks	L3	CO1	PO2
	b)	Analyze different types of pressure and give 3 different units of the quantity they measure.	6 Marks	L2	CO2	PO2

UNIT-III

5.	a)	Select a suitable level measurement device for to measure the level of high conductive liquid with suitable explanation.	6 Marks	L1	CO2	PO4
	b)	Measurement of Level could be done based on differential pressure. Explain the construction, working principle of level measurement based on differential pressure.	6 Marks	L1	CO2	PO1
		(OR)				
6.	a)	Design a level sensing mechanism to measure level of a tank with the following requirements using resistive technique. Resolution of 1 cm. Range of 10 cm. Diameter of the tank is 10 cm with clean liquid. Draw a suitable diagram to represent the design and signal conditioning circuit for given specifications.	6 Marks	L3	CO2	PO4
	b)	Compare and differentiate the operation of various electric types of level measurement techniques.	6 Marks	L3	CO2	PO2

UNIT-IV

7.	a)	Select a suitable flow measuring device which is vertically installed and explain its working principle of hot wire anemometer with suitable diagram.	6 Marks	L2	CO2	PO4
	b)	Give the types of Flow. Sketch the construction and elaborate the working principle of Liquid bridge mass flow meter.	6 Marks	L1	CO2	PO1
		(OR)				
8.	a)	List different Flow sensing mechanisms. Present an analysis of different mechanisms, their merits and demerits.	6 Marks	L2	CO2	PO4
	b)	Show how a Hotwire anemometer and EM flow meter could be used for measurement of flow rate using a neat sketch and appropriate representation.	6 Marks	L2	CO2	PO4

UNIT-V

9.	a)	List different proximity sensor types and compare their merits and demerits.	6 Marks	L3	CO4	PO3
	b)	Design a voltage to current converter to convert 0-5 V to 4 to 20mA.	6 Marks	L3	CO3	PO3
		(OR)				
10.	a)	How is a charge amplifier different from electrometer amplifier? Explain the working of charge amplifier with a neat sketch.	6 Marks	L1	CO3	PO1
	b)	Elaborate the safety measure to avoid hazardous conditions in industries.	6 Marks	L3	CO4	PO6

CODE No.: 19BT50201 SVEC-19

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

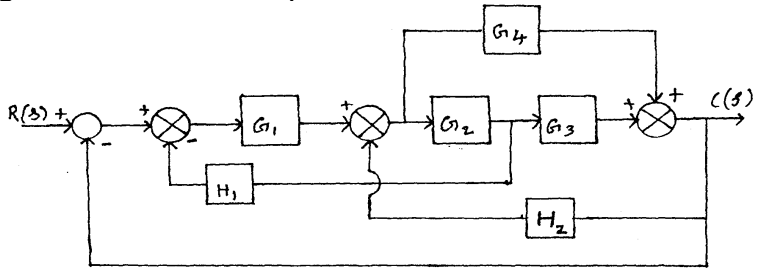
CONTROL SYSTEMS
[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

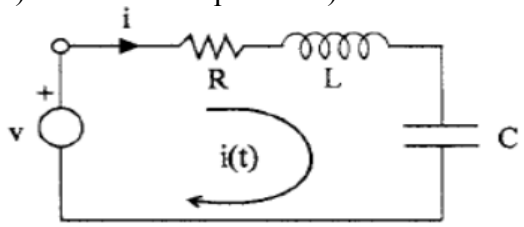
UNIT-I

1.	a)	Derive an expression for the transfer function of an Armature controlled DC motor.	6 Marks	L3	CO1	PO1
	b)	Obtain transfer function for the given system using block diagram reduction techniques.	6 Marks	L3	CO1	PO5



(OR)

2.	a)	Define transfer function and enumerate its advantages and disadvantages.	4 Marks	L2	CO1	PO1
	b)	Obtain the relation between the applied voltage and the current in the form of i) Differential equation ii) Transfer function.	8 Marks	L3	CO1	PO2



UNIT-II

3.	a)	Derive the expression for steady state error and obtain its static error constants k_p, k_v and k_a.	6 Marks	L2	CO2	PO1
	b)	For a system whose transfer function is $G(S)=\frac{1}{S(S+1)}$, the input to the system is described by $r(t)=4+6t+2t^2$. Find the generalized error coefficients and steady state error.	6 Marks	L4	CO2	PO2

(OR)

4.	a)	What is an integral controller and justify how does it improves the dynamics of a control system?	4 Marks	L2	CO2	PO7
	b)	Determine the nature of the closed-loop system for a unit-step input from open loop transfer function of unity feedback system given by $G(S)=\frac{8}{S(S+1)}$. Also determine rise time, peak time and peak overshoot.	8 Marks	L2	CO2	PO2

UNIT-III

5.	a)	Draw the Nyquist plot for the system whose open loop transfer function is $G(S)H(S) = \frac{K}{S(S+2)(S+10)}$. Determine the range of 'K' for which closed loop system is stable.	6 Marks	L2	CO3	PO2
	b)	Determine the range of K for which the system represented by the characteristic equation $S^2 + KS + 2K - 1 = 0$ Sis stable.	6 Marks	L2	CO3	PO4

(OR)

6.		Sketch the Bode plots showing the magnitude in dB and phase angle in degrees as a function of log frequency for the transfer function $G(S)H(S) = \frac{KS^2}{(1+0.2S)(1+0.02S)}$. Determine the system gain *K* for the gain cross over frequency to be 5 rad/sec.	12 Marks	L2	CO3	PO4

UNIT-IV

7.		A Unity feedback system has an open loop transfer function $G(S) = \frac{K}{S(1+2S)}$. Design a lag compensator so that the phase margin is 40° and the steady state error for ramp input is less than or equal to 0.2.	12 Marks	L4	CO4	PO3

(OR)

8.		Consider the unity feedback system whose open loop transfer function is $G(s)H(s) = \frac{K}{S(S+3)(S+6)}$. Design a suitable compensator to meet the following specifications i) Velocity error constant, $K_v = 80$ and ii) Phase margin=35^0.	12 Marks	L4	CO4	PO3

UNIT-V

9.		Test the controllability and observability of a system described by $\begin{bmatrix} \dot{X}_1 \\ \dot{X}_2 \\ \dot{X}_3 \end{bmatrix} = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -160 & -56 & -14 \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \\ X_3 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \\ -14 \end{bmatrix} u, \quad y = \begin{bmatrix} 1 & 0 & 0 \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \\ X_3 \end{bmatrix}$	12 Marks	L4	CO5	PO4

(OR)

10.	a)	State the properties of state transition matrix and its significance.	6 Marks	L2	CO5	PO1
	b)	Find the state transitions matrix of the following system $\dot{X} = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -2 & -5 & -4 \end{bmatrix} X.$	6 Marks	L3	CO5	PO2

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations December - 2022

PRINCIPLES OF COMMUNICATION

[ELECTRONICS AND INSTRUMENTATION ENGINEERING]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Find the Fourier transform of unit impulse, unit step and ramp signals. Draw the corresponding Fourier spectrum.	7 Marks
	b)	A signal $m(t)$ is multiplied with $\cos w_0 t$. Determine the Fourier Transform of the resulting signal.	7 Marks
		(OR)	
2	a)	Define the Cross Correlation function. Explain about its properties.	7 Marks
	b)	Explain the necessity of communication. Explain about convolution of signals.	7 Marks

UNIT-II

3	a)	Explain the principle of V.S.B Transmission. What are its advantages over S.S.B?	7 Marks
	b)	The antenna current of an AM transmitter is 9A when only carrier is transmitted but it increases to 10.6A when the carrier is modulated by a single sine wave. Find the percentage of modulation. Determine the antenna current when the percentage of modulation changes to 0.8.	7 Marks
		(OR)	
4	a)	With necessary equations. Explain the generation of N.B.F.M using narrow band P.M generator.	7 Marks
	b)	Explain the comparisons between FM and AM techniques.	7 Marks

UNIT-III

5	a)	The spectral range of a function extends from 10.0 MHz. Find the minimum sampling rate, the maximum sampling time.	9 Marks
	b)	Discuss about the generation of PPM.	5 Marks
		(OR)	
6	a)	Distinguish FDM & TDM. What do you mean by asynchronous multiplexing?	5 Marks
	b)	What is PWM? What other names does it have? With the help of a circuit diagram explain PWM demodulation and explain its operation.	9 Marks

UNIT-IV

7	a)	Draw the block diagram of PCM generator and explain each block.	8 Marks
	b)	Explain the operation of FSK modulator.	6 Marks
		(OR)	
8	a)	Discuss the effect of noise in Delta modulation	8 Marks
	b)	Distinguish among PSK, DPSK and QPSK.	6 Marks

UNIT-V

9	a)	Define mutual information. State and prove the properties of it..	7 Marks
	b)	Explain the concept of Huffman coding technique by taking an example.	7 Marks
		(OR)	
10	a)	Explain the concept of error detection and correction using hamming codes.	7 Marks
	b)	Explain about code tree, trellis and state diagrams for a convolutional encoder.	7 Marks

❀ ❀ ❀

CODE No.: 22AI101001 MBU-22

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Regular Examinations December – 2022

DISCRETE MATHEMATICAL STRUCTURES

[Computer Science and Engineering (Artificial Intelligence and Machine Learning), Computer Science and Engineering (Data Science), Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Construct the truth table for the compound proposition $(p \rightarrow q) \vee (\neg p \rightarrow q)$.	2 Marks	L3	CO1
	b)	When do you say that two compound propositions are equivalent?	2 Marks	L4	CO1
	c)	Find the recurrence relation for the Fibonacci sequence.	2 Marks	L1	CO2
	d)	Define: i) Reflexive relation ii) Symmetric relation	2 Marks	L2	CO2
	e)	Prove that $1 + 2 + 3 + \cdots + n = n(n+1)/2$ using Mathematical Induction.	2 Marks	L1	CO3
	f)	In how many ways can all the letters in MATHEMATICAL be arranged?	2 Marks	L3	CO3
	g)	Define Generating Function.	2 Marks	L1	CO4
	h)	How many permutations are there in the word MOHAN BABU?	2 Marks	L3	CO4
	i)	How many edges are there in a graph with 10 vertices each of degree 3?	2 Marks	L3	CO5
	j)	Define a graph and give an example.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Without constructing the truth tables, obtain the principle disjunctive normal form of $(\neg p \rightarrow r) \wedge (q \leftrightarrow r)$.	8 Marks	L2	CO1
	b)	Test the validity of the following argument, If an integer is divisible by 12 then it is divisible by 2.If an integer is divisible by 2, then it is divisible by 3.Therefore the integer divisible by 12 is also divisible by 3.	8 Marks	L3	CO1
		(OR)			
3.	a)	Obtain the PDNF and PCNF of $(P \wedge Q) \vee (\neg P \wedge R)$	8 Marks	L6	CO1
	b)	Write the negation of the statement $(\exists x)(\forall y)P(x, y)$.	8 Marks	L4	CO1

MODULE-II

4.	a)	Determine which elements have complements and which do not have complements if 45 *D* denotes the set of all divisors of 45, under divisibility ordering.	8 Marks	L3	CO2
	b)	Illustrate that (S, /) is a lattice, where S = (1,2,3,6) and / is for divisibility and also prove that this is a distributive lattice.	8 Marks	L1	CO2
		(OR)			
5.	a)	Find the recurrence relation satisfying the equation $yn = A(3)^n + B(-4)^n$.	8 Marks	L4	CO2
	b)	Examine whether given set 'S', where S = {0,1,2,3,4,5} can be semi group under binary operation Θ5.	8 Marks	L5	CO2

MODULE-III

6.	a)	Use mathematical induction to show that $n^2 - 1$ is divisible by 8 whenever n is an odd positive integer.	8 Marks	L3	CO3
	b)	Discuss that monoid homomorphism preserves the property of invertibility with an example.	8 Marks	L1	CO3
		(OR)			
7.	a)	Show that the additive group Z_4 is isomorphic to the multiplicative group of non-zero element of Z_5.	8 Marks	L3	CO3
	b)	State and prove Lagrange's theorem.	8 Marks	L1	CO3

MODULE-IV

8.	a)	Use the method of generating function to solve the recurrence relation $an + an - 14an - 2 + 4n$, $n \geq 2$.	8 Marks	L1	CO4
	b)	Determine the number of positive integers n such that 1<=n<=100 and n is not divisible by 2,3 or 5.	8 Marks	L1	CO4
		(OR)			
9.	a)	Solve the Recurrence Relation $a_n-7a_{n-1}+10a_{n-2}=0$, n>=2 where the initial conditions are $a_0=10$ and $a_1=41$ using generating functions.	8 Marks	L2	CO4
	b)	How many ways can 3 novels and 2 biographies can be arranged in a shell if There are 5 novels and 4 biographies?	8 Marks	L3	CO4

MODULE-V

10.	a)	Prove that the complement of a disconnected graph is connected.	8 Marks	L2	CO5
	b)	Define Spanning Tree. Explain DFS algorithm with an Example.	8 Marks	L1	CO5
		(OR)			
11.	a)	Derive a connected graph has an Euler trail if and only if it has at most two vertices of odd degree.	8 Marks	L3	CO5
	b)	Define MST. Explain Kruskal's Algorithm with an Example.	8 Marks	L2	CO5

CODE No.: 22CE107601 MBU-22

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Regular Examinations December – 2022

ENVIRONMENTAL SCIENCE

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Write about Global warming.	2 Marks	L1	CO1
	b)	Write a note on dams and other effects on forest.	2 Marks	L2	CO1
	c)	List some of the food resources available in the world.	2 Marks	L2	CO2
	d)	List any four characteristics of ecosystem.	2 Marks	L1	CO2
	e)	What are the three types of biodiversity?	2 Marks	L1	CO3
	f)	What is Ecological succession?	2 Marks	L1	CO3
	g)	Explain e–waste management.	2 Marks	L4	CO4
	h)	List any four effects of acid rain.	2 Marks	L2	CO4
	i)	What is zero population growth?	2 Marks	L2	CO5
	j)	Write about Environmental audit.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	What are the problems caused by deforestation? Suggest a remedial measure.	8 Marks	L2	CO1
	b)	How can you as an individual conserve the different natural resources? Discuss.	8 Marks	L1	CO1
		(OR)			
3.	a)	Write about Role of IT in Environment and human health.	8 Marks	L2	CO1
	b)	How the modern agricultural practices affect our environment? List and suggest some remedies.	8 Marks	L4	CO1

MODULE-II

4.	a)	Briefly describe the structure and functions of ecosystem.	8 Marks	L2	CO2
	b)	Discuss the energy flow in an ecosystem.	8 Marks	L4	CO2
		(OR)			
5.	a)	Define ecosystem. Describe food chain and food web.	8 Marks	L1	CO2
	b)	Explain in detail about waste land reclamation.	8 Marks	L4	CO2

MODULE-III

6.	a)	Define biodiversity. Discuss the factors affecting biodiversity.	8 Marks	L2	CO3
	b)	Explain about Conservation of biodiversity.	8 Marks	L4	CO3
		(OR)			
7.		Write short notes on: i) Classification of bio-geographical regions of India. ii) Concepts and Criteria of biodiversity hot spots.	16 Marks	L2	CO3

MODULE-IV

8.	a)	Explain about Wildlife Protection Act.	8 Marks	L2	CO4
	b)	List the major Pollution control Acts in India.	8 Marks	L1	CO4
		(OR)			
9.	a)	Write short notes on: i) Earthquake ii) Land slides	8 Marks	L2	CO4
	b)	Describe the Sources, Effects and Methods of control of the Water pollution	8 Marks	L4	CO4

MODULE-V

10.	a)	What is sustainable development? Briefly describe the concept and important pillars of sustainable developments.	8 Marks	L2	CO5
	b)	What is age structure of population? Compare few age structures of different countries.	8 Marks	L2	CO5
		(OR)			
11.	a)	Describe the role of ICT on human health and environment.	8 Marks	L4	CO5
	b)	Write briefly about Green Campus and green business.	8 Marks	L2	CO5

CODE No.: 22CE107603 MBU-22

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Regular Examinations, December – 2022

RURAL TECHNOLOGY

[Computer Science and Engineering (Artificial Intelligence and Machine Learning),

Computer Science and Engineering (Data Science),

Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Write full form of NABARD and CAPART.	2 Marks	L1	CO1
	b)	Write the significance of MNREG act 2005	2 Marks	L2	CO1
	c)	Mention any three types of alternative sources of energy.	2 Marks	L1	CO2
	d)	Through which source electrification in rural areas can be done better and at cheaper rates.	2 Marks	L1	CO2
	e)	Mention any four drinking water standards.	2 Marks	L1	CO3
	f)	Give any two social impacts of tissue culture.	2 Marks	L1	CO3
	g)	Distinguish between Pisciculture and Aquaculture.	2 Marks	L2	CO4
	h)	What is rain water harvesting?	2 Marks	L1	CO4
	i)	Mention any four corporate social responsibilities.	2 Marks	L2	CO5
	j)	Write about SAGY.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	What is the role of CAPART, NABARD, CSIR, and NIF in issues of technology transfer?	8 Marks	L4	CO1
	b)	Analyze the role of science and technology in eradication of poverty in rural areas.	8 Marks	L4	CO1
		(OR)			
3.	a)	Discuss about Rural Business Hubs and NREG act.	8 Marks	L3	CO1
	b)	Write about pre and post independence period technologies.	8 Marks	L2	CO1

MODULE-II

4.	a)	Write about biogas and production of biomass products.	8 Marks	L4	CO2
	b)	List the different forms of non conventional energy. Compare and contrast various methods used for energy generation from biomass.	8 Marks	L4	CO2
		(OR)			
5.	a)	State the working principle of solar energy. What are the various applications of solar energy?	8 Marks	L2	CO2
	b)	What is bio-gas? Discuss how one can process and generate biogas using the locally available raw materials as an alternative for conventional cooking fuel.	8 Marks	L3	CO2

MODULE-III

6.	a)	Explain the role of building and construction technologies in rural development.	8 Marks	L3	CO3
	b)	Discuss cultivation and processing techniques of mushroom cultivation.	8 Marks	L2	CO3
		(OR)			
7.	a)	Explain various construction technologies in rural areas.	8 Marks	L3	CO4
	b)	Discuss foods and agro based technologies which will give employment and profits to community.	8 Marks	L2	CO3

MODULE-IV

8.	a)	Recognize the need for water conservation. Explain about rain water harvesting techniques in detail.	8 Marks	L2	CO4
	b)	What is meant by apiculture? Explain opportunities present in apiculture.	8 Marks	L2	CO4
		(OR)			
9.	a)	Explore the possibilities of improving the sanitation in the rural areas by adopting latest techniques that would have positive effect on the public health and environment.	8 Marks	L2	CO4
	b)	Explain about medical and aromatic plants with their importance.	8 Marks	L4	CO4

MODULE-V

10.	a)	State the role of private sector in provision of employment and education in rural areas.	8 Marks	L4	CO5
	b)	Enlist the program focusing on social and cultural Development in rural areas and explain in detail.	8 Marks	L3	CO5
		(OR)			
11.	a)	Explain in detail the role of information technology and its usage in day to day life in rural community.	8 Marks	L2	CO5
	b)	Explain about Saansad Adarsh Gram Yojana (SAGY).	8 Marks	L4	CO5

CODE No.: 22CS101001 MBU-22

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Regular Examinations December – 2022

DIGITAL LOGIC DESIGN

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Convert (1E5.7A)16 into binary and Hexadecimal.	2 Marks	L2	CO1
	b)	Convert (367.52)8 into binary.	2 Marks	L2	CO1
	c)	Simplify the expression F (X,Y,Z) = ∑ (0,2,4,5,6) .	2 Marks	L2	CO2
	d)	Simplify F (A,B,C) = ∏ M (0,2,3,5) using K-Map	2 Marks	L2	CO2
	e)	Implement a Half adder using a decoder and OR gates.	2 Marks	L2	CO2
	f)	Analyze the operation of D flip-flop using NAND gates.	2 Marks	L2	CO3
	g)	Implement encoder circuit.	2 Marks	L2	CO2
	h)	Design 4x1 Multiplexer.	2 Marks	L2	CO3
	i)	Design a 1-bit comparator using a PLA.	2 Marks	L2	CO4
	j)	Realize a full adder circuit using PAL.	2 Marks	L2	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 x 16 = 80 Marks

MODULE-I

2.	a)	Perform binary subtraction of the following numbers using 1's Complement: i) 11101-10110. ii) 11011 – 10101.	8 Marks	L2	CO1
	b)	Find compliment of the function, F = xy'z' + xyz, using De-Morgan's theorem.	8 Marks	L2	CO1
		(OR)			
3.	a)	Let X = 74581 and Y = 43662. Perform X - Y using 9'S complement and 10'S complement.	8 Marks	L2	CO1
	b)	Minimize the following functions using Boolean algebra. i) y'z' + w'x'z' + w'xyz' + wyz' ii) ABC + A'B'C + A'BC +ABC' + A'B'C'	8 Marks	L2	CO1

MODULE-II

4.	a)	Derive the truth table and logics diagram for the fallowing Boolean expression $F = X'Y'Z + X'YZ' + XY'Z' + XYZ$.	8 Marks	L2	CO2
	b)	Design a Half adder and Full adder using appropriate logic gates.	8 Marks	L2	CO2
		(OR)			
5.	a)	Simplify the following function and implement with logic gates F=Σm(0,1,3,4,5,7,9,11,13,15).	8 Marks	L2	CO2
	b)	Simplify the following function and implement with logic gates F=ΠM(2,4,5,7,9,10,12) using K-Map.	8 Marks	L3	CO2

MODULE-III

6.	a)	Implement the function f (A, B, C) = ∑m (1, 2,3, 4, 5, 6) using an appropriate multiplexer.	8 Marks	L2	CO3
	b)	Illustrate the operation of Binary Adder/Subtractor using 2's Complement.	8 Marks	L2	CO3
		(OR)			
7.	a)	Illustrate the operation of 2 x 4 Decoder using logic gates.	8 Marks	L2	CO3
	b)	Construct a 4-to-16 line decoder with five 2-to-4 line decoders with enable.	8 Marks	L2	CO3

MODULE-IV

8.	a)	The content of a 4-bit register is initially 1110. The register is shifted six times to the right with the serial input being 100011. What is the content of the register after each shift?	10 Marks	L2	CO3
	b)	Design a MOD 6 synchronous up counter using T-flip flops.	6 Marks	L3	CO3
		(OR)			
9.	a)	Illustrate the operation of a 4 bit Serial-in serial-out shift register.	8 Marks	L2	CO3
	b)	Draw and illustrate the operation of a 3-bit ripple UP counter using JK flip-flops.	8 Marks	L2	CO3

MODULE-V

10.	a)	Construct a logic circuit for F=Σm(1,2,3);G=Σm(0,1,3) using a CPLD macrocell.	8 Marks	L2	CO4
	b)	Obtain the realization of 3 bit even parity generator using a PROM.	8 Marks	L2	CO4
		(OR)			
11.	a)	Design a PLA based logic circuit for F =A'B+ABC'+AB+A'C' and G = A'C+ABC+A'B'.	8 Marks	L2	CO4
	b)	Realize the Boolean expressions F1=XY'Z'+X'Y'+Y'Z and F2=XYZ+Y'Z by using Programmable Array Logic.	8 Marks	L2	CO4

CODE No.: 22CS102001 MBU-22

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Regular Examinations December – 2022

PROGRAMMING FOR PROBLEM SOLVING

[Computer Science and Engineering, Computer Science and Engineering (Artificial Intelligence and Machine Learning), Computer Science and Engineering (Data Science), Computer Science and Engineering (Cyber Security) Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define tokens. Give example.	2 Marks	L1	CO1
	b)	What is type conversion? Give example.	2 Marks	L1	CO1
	c)	Differentiate goto and continue.	2 Marks	L2	CO1
	d)	List out the characteristics of algorithm.	2 Marks	L1	CO2
	e)	How to define a function?	2 Marks	L1	CO3
	f)	What are the storage classes?	2 Marks	L1	CO3
	g)	How to initialize a pointer?	2 Marks	L1	CO4
	h)	Define array of pointers.	2 Marks	L2	CO4
	i)	How do access the members in structure?	2 Marks	L1	CO5
	j)	What do you mean by files of records?	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.		Explain about different operators available in C with examples.	16 Marks	L1	CO1
		(OR)			
3.		Explain in detail about different unformatted input and output function in C with example.	16 Marks	L2	CO1

MODULE-II

4.	a)	Write a C program to perform swapping without using third variable.	8 Marks	L1	CO1
	b)	Write a C program to check whether the given number is Armstrong number or not.	8 Marks	L1	CO1
		(OR)			
5.	a)	Write an algorithm to find the given year is leap year or not.	8 Marks	L1	CO2
	b)	Draw a flowchart to perform addition of ‘n’ numbers.	8 Marks	L1	CO2

MODULE-III

6.	a)	Write a C program to perform multiplication of two matrices.	8 Marks	L1	CO3
	b)	Explain about string handling functions in C with example.	8 Marks	L1	CO3
		(OR)			
7.	a)	Explain about call by value with an example.	8 Marks	L1	CO3
	b)	Write a C program to find the factorial of a given number using Recursion.	8 Marks	L2	CO3

MODULE-IV

8.	Explain in detail about dereferencing with example.	16 Marks	L3	CO4
	(OR)			
9.	Write a C program to concatenate two strings using pointers.	16 Marks	L2	CO4

MODULE-V

10.	Define a structure called student that would contain name, reg-no and marks of five subjects and percentage. Write a program to read the details of name, reg-no and marks of five subjects for 30 students, calculate the percentage and display the name, reg-no, marks of 30 subjects and percentage of each student.	16 Marks	L3	CO5
	(OR)			
11.	Explain the use of structure within a structure and array of structures using examples.	16 Marks	L1	CO5

CODE No.: 22CS102002 MBU-22

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Regular Examinations, December – 2022

PYTHON PROGRAMMING

[Computer Science and Engineering (Artificial Intelligence and Machine Learning),

Computer Science and Engineering (Data Science),

Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Classify different types of statements in Python.	2 Marks	L4	CO1
	b)	List the types of operators available in Python.	2 Marks	L2	CO1
	c)	Present the flow of execution for a while statement.	2 Marks	L1	CO2
	d)	Write the syntax for creation of Tuple.	2 Marks	L1	CO2
	e)	Examine different Set functions.	2 Marks	L4	CO3
	f)	Define Python List. How Lists differ from Tuples?	2 Marks	L1	CO3
	g)	Describe renaming and deleting a file in Python.	2 Marks	L2	CO4
	h)	What does recursive function imply?	2 Marks	L1	CO4
	i)	Define how the write method works on a file.	2 Marks	L1	CO5
	j)	Difference between built-in exceptions and handling exceptions.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Using a simple python snippet, analyze different values, types and expression and explain them.	8 Marks	L4	CO1
	b)	Explain in detail about the literals with suitable example.	8 Marks	L1	CO1
		(OR)			
3.	a)	Design a calculator with Python code by defining its algorithm using different notations.	8 Marks	L6	CO1
	b)	List the types of operators in Python and thus explain the different expressions involved in Python.	8 Marks	L3	CO1

MODULE-II

4.	a)	Using the concept of control structure determine the prime numbers in given range using Python.	8 Marks	L3	CO2
	b)	Explain with an example break and continue statements using while loop.	8 Marks	L4	CO2
		(OR)			
5.	a)	Write a Python program to find the sum of N natural numbers.	8 Marks	L1	CO2
	b)	Write a Python program to display the inverted pyramid.	8 Marks	L3	CO2

MODULE-III

6.	a)	Write a Python program to store 'n' numbers in a list and sort the list using selection sort.	8 Marks	L5	CO3
	b)	Write a program to perform the logic of quick sort algorithm.	8 Marks	L1	CO3
		(OR)			
7.	a)	Explain the feature of dictionaries with suitable example.	8 Marks	L1	CO3
	b)	Write Python code to multiply two matrices using nested loops and also perform transpose of the resultant matrix.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Write a function to print the hash of any given file in Python.	8 Marks	L3	CO4
	b)	List and explain the different file modes in Python.	8 Marks	L1	CO4
		(OR)			
9.	a)	Describe the role of Python interpreter in functions. Explain possible ways of assigning a function.	8 Marks	L1	CO4
	b)	Write a function to print the hash of any given file in Python.	8 Marks	L4	CO4

MODULE-V

10.	a)	Demonstrate the use of Exception Handling in Python.	8 Marks	L2	CO5
	b)	How to create, raise and handle user defined exceptions in Python? Illustrate with a Python program.	8 Marks	L2	CO5
		(OR)			
11.	a)	Describe with an example exception with arguments in Python.	8 Marks	L1	CO5
	b)	Write a Python program that uses datetime module within a class, takes a birthday as input and prints the age and the number of days, hours, minutes and second.	8 Marks	L3	CO5

CODE No.: 22EE102401 MBU-22

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Regular Examinations, December – 2022

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	State the Kirchhoff's laws.	2 Marks	L1	CO1
	b)	Distinguish between potential difference and electromotive force.	2 Marks	L3	CO1
	c)	Describe the purpose of using core in a transformer.	2 Marks	L2	CO2
	d)	Describe the step by step procedure of earthing.	2 Marks	L2	CO2
	e)	State some recommended Illumination levels for Flood lighting.	2 Marks	L2	CO3
	f)	Mention the important factors to be considered while selection of UPS components to a specific load.	2 Marks	L3	CO3
	g)	Describe how Light sensors work.	2 Marks	L2	CO4
	h)	Define transducer and give an example.	2 Marks	L2	CO4
	i)	Explain the working of Zener diode as voltage regulator.	2 Marks	L3	CO5
	j)	Draw the functional block diagram of an operational amplifier.	2 Marks	L2	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

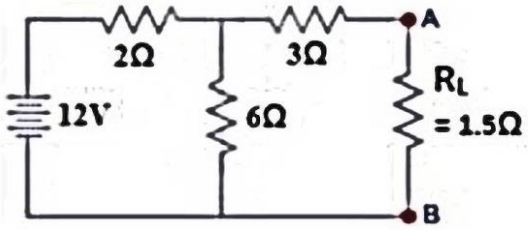
5 X 16 = 80 Marks

MODULE-I

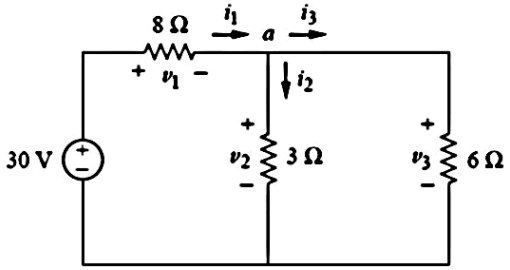
2.	a)	State Ohms Law and mention any three limitations.	6 Marks	L2	CO1
	b)	The resistance of 6, 3, 9 are connected in parallel across a supply of 100V, find i) Effective resistance of the circuit. ii) total current in the circuit. iii) current through each resistance.	10 Marks	L2	CO1

(OR)

3.	a)	Find the current through the resistance RL (1.5 Ω) of the circuit shown in the figure below using Norton's Theorem.	8 Marks	L2	CO1



	b)	Find current and voltage for the given circuit using KVL.	8 Marks	L2	CO1



MODULE-II

4.	a)	Discuss in brief construction and principle of single phase induction motor. Also explain the losses.	8 Marks	L2	CO2
	b)	Explain the necessity of earthing in an electrical system installation. Also state the points to be earthed in internal / wiring system of a residential building.	8 Marks	L2	CO2

(OR)

5.	a)	Define hysteresis and eddy current losses, mention how they can minimized in transformers.	8 Marks	L2	CO2
	b)	Define relay. Explain the working principle of relay with neat sketch.	8 Marks	L2	CO2

MODULE-III

6.	a)	With neat sketch, explain the working principle of Incandescent lamp. Mention the types, advantage and disadvantages.	8 Marks	L2	CO3
	b)	The front of a building 35 × 18 m is illuminated by 15 lamps; the wattage of each lamp is 80 W. The lamps are arranged so that uniform illumination on the surface is obtained. Assuming a luminous efficiency of 20 lumens/W, the coefficient of utilization is 0.8, the waste light factor is 1.25, DF = 0.9. Determine the illumination on the surface.	8 Marks	L3	CO3

(OR)

7.	a)	Design an Uninterruptible Power Supply (UPS) Circuit for typical home load.	8 Marks	L3	CO3
	b)	List out the types of batteries, and with a neat sketch, Explain the operation of lead acid battery.	8 Marks	L2	CO3

MODULE-IV

8.	a)	With neat diagram explain the working of motion detection sensor and voltage sensor.	8 Marks	L2	CO4
	b)	Describe LVDT. What are the advantages and disadvantages of LVDT?	8 Marks	L3	CO4

(OR)

9.	a)	With a clean sketch, explain operation of a Wireless Bluetooth sensor.	8 Marks	L3	CO4
	b)	Describe the working procedure of a Hall-Effect transducer.	8 Marks	L2	CO4

MODULE-V

10.	a)	Name the device which can be used as regulator, and mention its characteristics.	8 Marks	L3	CO5
	b)	Draw the circuit diagram of non-inverting operational amplifier (OP-AMP) and drive the expression for its closed lop voltage gain.	8 Marks	L2	CO5

(OR)

11.	a)	Explain the working of Zener diode and BJT.	8 Marks	L2	CO5
	b)	Create a three-bit R-2R digital-to-analog conversion using an inverting Op-Amp.	8 Marks	L3	CO5

❀ ❀ ❀

CODE No.: 22EE102402 MBU-22

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Regular Examinations, December – 2022

FUNDAMENTALS OF ELECTRICAL ENGINEERING

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Deduce the relationship between line and phase voltage in a star connected system.	2 Marks	L1	CO1
	b)	A 10A current source has a source resistance of 100Ω. What will be the equivalent voltage source?	2 Marks	L2	CO1
	c)	Define natural and damped frequency.	2 Marks	L1	CO2
	d)	What is the time constant of RC Circuit with R=10KΩ and C=40μF?	2 Marks	L2	CO2
	e)	List the various types of single phase induction motors.	2 Marks	L1	CO3
	f)	How would you reverse the direction of rotation of a capacitor start-induction-run motor?	2 Marks	L2	CO3
	g)	What is a BLDC motor? Mention their advantages.	2 Marks	L1	CO4
	h)	Differentiate between DC motors and BLDC motors.	2 Marks	L2	CO4
	i)	Draw the approximate equivalent circuit of a single-phase transformer.	2 Marks	L1	CO5
	j)	Why the iron losses are neglected in a short circuit test of a single-phase transformer?	2 Marks	L2	CO5

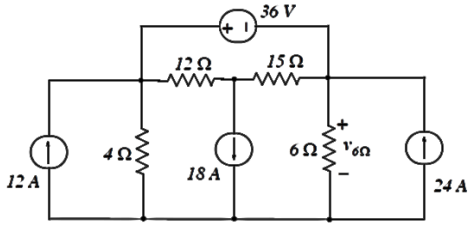
PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

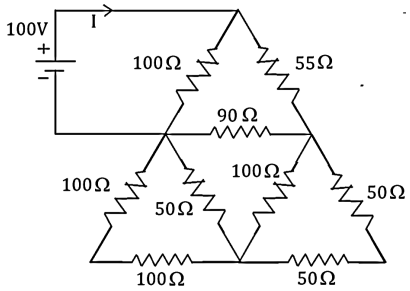
5 X 16 = 80 Marks

MODULE-I

2.	a)	Use nodal analysis to compute the voltage v6Ω in the circuit.	8 Marks	L3	CO1

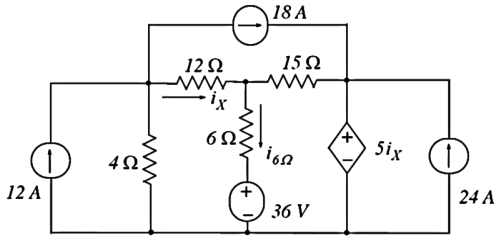


	b)	Determine the total current taken from the source in the figure by Star-Delta Transformation.	8 Marks	L3	CO1

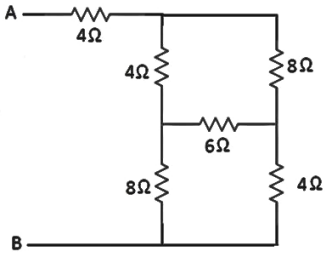


(OR)

3.	a)	Use mesh analysis to compute the current through the $i_{6\Omega}$ resistor.	8 Marks	L3	CO1



	b)	Find the equivalent resistance between A & B in the given network	8 Marks	L3	CO1



MODULE-II

4.	a)	A load absorbs 2.5kW at a power factor of 0.707 lagging from a 230V, 50Hz source. A capacitor is connected in parallel to the load in order to improve the power factor to 0.9 lag. Determine the value of the capacitor.	8 Marks	L3	CO2
	b)	Analyze the response of Parallel R-C circuit when connected to single phase AC supply.	8 Marks	L3	CO2

(OR)

5.	a)	A RLC parallel circuit consists of R=50Ω, L=150mH and C=100μF. The circuit is excited by a current source of $5\angle 00$A, 100Hz. Calculate the voltage and current in the various elements. Determine the apparent, active and reactive power delivered by the source. Draw the phasor diagram.	8 Marks	L3	CO2
	b)	Analyze the response of Parallel RLC circuit when connected to single phase AC supply.	8 Marks	L3	CO2

MODULE-III

6.	a)	How to make Single-Phase Induction Motor Self-Starting? Explain with neat sketches.	8 Marks	L3	CO3
	b)	Describe the principal of operation of Split-Phase Induction Motor with neat sketch.	8 Marks	L3	CO3

(OR)

7.	a)	Write a short note on the principal of operation of Capacitor Start and Capacitor Run Induction Motor with neat sketch.	8 Marks	L3	CO3
	b)	A 200W, 230V, 50Hz capacitor-start motor has the following winding constants. Main winding: R= 4.5Ω; XL=3.7Ω Starting winding: R= 9.5Ω; XL=3.5Ω Find the value of starting capacitance that will result in the maximum starting torque.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Explain Operation of PMBLDC motor in detail with neat sketch.	8 Marks	L3	CO4
	b)	Explain the operation and applications of variable reluctance stepper motor with neat sketches.	8 Marks	L3	CO4

(OR)

9.	a)	Explain the operation and applications of Permanent Magnet stepper motor with neat sketches.	8 Marks	L3	CO4
	b)	Compare between BLDC motors and PMSM.	8 Marks	L3	CO4

MODULE-V

10.	a)	Obtain the equivalent circuit of a 10 KVA, 450/120 V, 50 Hz, 1-phase transformer referred to L.V. side from the following test data : O.C. test (L.V. side) : 120 V, 4.2 A, 80 W. S.C. test (H.V. side) : 9.65 V, 22.2 A, 120 W.	8 Marks	L3	CO5
	b)	A 2200 V/200 V, single-phase transformer takes 1A on the HV side on no-load at a p.f. of 0·385 lagging. If a load of 50 A at a p.f. of 0·8 lagging is taken from the secondary of the transformer, calculate the primary current and its power factor.	8 Marks	L3	CO5

(OR)

11.	a)	A 20 kVA, 2500/250, 50 Hz, 1-phase transformer has the following test results: O.C. test (L.V. side): 250 V, 1.4 A, 105 W S.C. test (H.V. side): 104 V, 8 A, 320 W. Compute the parameters of the approximate equivalent circuit referred to the low voltage side and draw the circuit.	8 Marks	L3	CO5
	b)	Explain S.C. Test performed on single-phase transformer with neat sketches.	8 Marks	L3	CO5

CODE No.: 22LG102401 MBU-22

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Regular Examinations, December – 2022

ENGLISH FOR PROFESSIONALS

[Computer Science and Engineering (Artificial Intelligence and Machine Learning), Computer Science and Engineering (Data Science), Computer Science and Engineering (Cyber Security) Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Complete the statement using suitable question tag. Rashid plays football very well, _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _?	2 Marks	L1	CO2
	b)	Fill in the blank using the correct article. He is ----- MLA of our constituency.	2 Marks	L1	CO2
	c)	Write the meaning of the following idiomatic expression. A little bird told me	2 Marks	L1	CO4
	d)	Write the meaning of the following idiomatic expression. In Black and White	2 Marks	L1	CO4
	e)	Write the meaning of the following idiomatic expression. Apple of somebody's eye	2 Marks	L1	CO4
	f)	Write one-word substitute for the description. One who is capable of using both hands	2 Marks	L1	CO4
	g)	Write one-word substitute for the description. Writing one's own life story	2 Marks	L1	CO4
	h)	Fill in the blank using verbs in the correct tense. When we reached the station, the train -----the platform. (leave)	2 Marks	L1	CO2
	i)	Read the sentence below and make the necessary changes. If you will come to the college, you will meet the principal.	2 Marks	L1	CO2
	j)	Read the sentence below and make the necessary changes. My father is working in the same office from 2020.	2 Marks	L1	CO2

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Write the meaning of the following idiomatic expressions. i) Cut no ice ii) Face the music iii) Not your cup of tea iv) Bell the cat v) Every cloud has a silver lining vi) Act one's age vii) Young at heart viii) As gentle as a lamb.	8 Marks	L1	CO4
	b)	Write a review on a movie you have recently watched	8 Marks	L1	CO5

(OR)

3.	a)	Write an essay on the science behind success of super heroes	8 Marks	L2	CO1
	b)	"Communication is the act of conveying messages." Justify the significance and relevance using verbal and non-verbal communication.	8 Marks	L2	CO1

MODULE-II

4.	a)	Write one-word substitutes for these descriptions. i) One who never believes presence of God ii) An organism living on both land and in water iii) A speech to oneself alone iv) One eats only fruits v) Study of hand writing vi) Loud and confused vii) Examine one's motivates or look inwards viii) Having a hole or empty space inside	8 Marks	L1	CO4
	b)	Write the description of your favorite holiday spot in your own words (200-250 words).	8 Marks	L2	CO5

(OR)

5.	a)	Illustrate Vertical, horizontal and diagonal flow of communication in organizations with examples.	8 Marks	L2	CO1
	b)	Write how H. G. Well describes a Martian in "The Cylinder Opens."	8 Marks	L1	CO1

MODULE-III

6.	a)	Discuss how to do Skimming and Scanning Correctly in Academic Reading?	8 Marks	L2	CO4
	b)	***Fill in the blanks using verbs in the correct tense.*** i) My father _ _ _ _ _ (take) a cup of tea daily in the morning. ii) Miss Latha _ _ _ _ _ (complete) three novels so far. iii) When I reached the stadium, the match _ _ _ _ (started) iv) The college _ _ _ _ _ (reopen) on 10th November. v) While I _ _ _ _ _ (come) to the college, I saw an accident. vi) They _ _ _ _ _ (watch) television since 8o clock. vii) I _ _ _ _ _ (do) my shopping. What shall I do now? viii) The Indian economy _ _ _ _ _ (grow) rapidly.	8 Marks	L1	CO2

(OR)

7.	a)	Communication barriers attempt to impede successful completion of the communication process. Illustrate with examples.	8 Marks	L2	CO1
	b)	According to Raman, why is the sea blue in color?	8 Marks	L2	CO1

MODULE-IV

8.	a)	***Complete the following sentences using an appropriate verb form. Choose your answers from the given options.*** 1) My teacher _ _ _ _ _ a lesson yesterday. i) was taught ii) taught iii) will have taught 2) If you _ _ _ _ _ early, you would have caught the school bus i) left ii) will left iii) had left 3) If you _ _ _ _ _ hard, you can get a good rank in EAMCET. i) work ii) worked iii) will work 4) John _ _ _ _ _ in the hospital for two weeks. i) will be lying ii) had been lying iii) has been lying 5) Last month he _ _ _ _ _ for an interview. i) will appear ii) appeared iii) is appearing	8 Marks	L3	CO2

6) If she had practiced well, she _ _ _ _ _ better performance.
i) can deliver ii) could deliver iii) could have delivered
7) Most probably he _ _ _ _ _ to school next week
i) comes ii) will come iii) will be coming
8) Now he _ _ _ _ asking questions to see if the students have understood the lesson
i) asks ii) is asking iii) will ask

	b)	"We can't imagine the world without communication". Discuss.	8 Marks	L2	CO1

(OR)

9.	a)	Write a description explaining the steps involved in installing MS Office in your laptop.	8 Marks	L1	CO5
	b)	With a fast pace of modern life more and more people are turning towards fast food for their main meals. Do you think the advantages outweigh the disadvantages?	8 Marks	L1	CO1

MODULE-V

10.	a)	***Fill in the blanks in the following sentences by using appropriate modals.*** i) I _ _ _ _ _ swim well when I was young. ii) It _ _ _ _ _ rain tomorrow. iii) This medicine _ _ _ _ _ have cured your illness. iv) _ _ _ _ _ we go for a cup of coffee? v) I _ _ _ _ _ rather request you to check my exercise before giving it to the teacher vi) We _ _ _ _ _ respect elders. vii) I badly _ _ _ _ _ a cup of tea. viii) If you work hard, you _ _ _ _ _ qualify the test.	8 Marks	L1	CO2
	b)	What are the factors that help make Ms. Zhou successful?	8 Marks	L1	CO1

(OR)

11.	a)	You want to organize an event in your college on the occasion of Independence Day. Submit a proposal for this.	8 Marks	L1	CO5
	b)	Imagine that you are planning to sell your laptop online. Write a short description in about 250-300 words.	8 Marks	L1	CO5

CODE No.: 22LG107601 MBU-22

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Regular Examinations December – 2022

PROFESSIONAL ETHICS AND HUMAN VALUES

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define the term moral autonomy.	2 Marks	L1	CO1
	b)	List the theories about right action,	2 Marks	L2	CO1
	c)	What is meant by integrity? How is it related to work ethics?	2 Marks	L1	CO2
	d)	What are the limitations of standard experiments?	2 Marks	L1	CO2
	e)	What are the advantages of code of ethics?	2 Marks	L1	CO3
	f)	Define the term discrimination.	2 Marks	L2	CO3
	g)	What are the rights of engineers?	2 Marks	L1	CO4
	h)	What is Whistle-blowing?	2 Marks	L1	CO4
	i)	What is the competence in professional ethics?	2 Marks	L3	CO5
	j)	How to enrich an institution?	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	Enumerate on moral issues and types of inquiry.	16 Marks	L1	CO1
	(OR)			
3.	Discuss any two theories on ethics.	16 Marks	L1	CO1

MODULE-II

4.	Discuss on theories about virtues.	16 Marks	L2	CO2
	(OR)			
5.	Discuss on Religion and divine command ethics.	16 Marks	L2	CO2

MODULE-III

6.	Compare and contrast engineering experiments with standard experiments with suitable examples.	16 Marks	L3	CO3
	(OR)			
7.	Explain the code of ethics to be followed by an engineer.	16 Marks	L1	CO3

MODULE-IV

8.	Discuss on the importance of collective bargaining.	16 Marks	L1	CO4
	(OR)			
9.	Explain professional rights and its role in a business organization.	16 Marks	L2	CO4

MODULE-V

10.	Discuss on constitution and universal order.	16 Marks	L1	CO5
	(OR)			
11.	Appraise the case study on socially and ecologically responsible engineers.	16 Marks	L3	CO5

CODE No.: 22MM101401 MBU-22

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Regular Examinations, December – 2022

MATRIX THEORY AND LINEAR ALGEBRA

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Determine the rank of the matrix, using determents. $A = \begin{bmatrix} -1 & 2 & 0 \\ 3 & 7 & 1 \\ 5 & 9 & 3 \end{bmatrix}$	2 Marks	L1	CO1
	b)	Determine the matrix $A = \begin{bmatrix} 4 & 0 & 0 \\ 0 & -3 & 0 \\ 0 & 0 & -5 \end{bmatrix}$ is an elementary matrix or not.	2 Marks	L1	CO1
	c)	Determine the Eigen Values of the matrix $A = \begin{bmatrix} 2 & 2 \\ 1 & 3 \end{bmatrix}$.	2 Marks	L1	CO2
	d)	Verify $A = \begin{bmatrix} 1 & 4 \\ 2 & 3 \end{bmatrix}$ satisfies Cayley-Hamilton theorem or not.	2 Marks	L1	CO2
	e)	Verify W={(x,2y,3z)/ x, y, z in R}is subspace of $V_3(R)$.	2 Marks	L1	CO3
	f)	Verify (1, 2, 1) and (3, 1, 5) in $R^3$are linear independent or not?	2 Marks	L1	CO3
	g)	Test the function T: $V_2(R) \rightarrow V_2(R)$ defined by T(x, y) = (0,y) is linear transformation or not ?	2 Marks	L1	CO3
	h)	Determine the kernel of the linear transformation T: $R^2 \rightarrow R^2$ defined by T(1, 0)=(1, 1) and T(0,1) = (-1, 2).	2 Marks	L1	CO3
	i)	Determine the distance between vectors (3, 4,-1) and (1, 3, 1) in V_3(R).	2 Marks	L1	CO4
	j)	Determine unit vector corresponding to (2, 1, 2) in V_3 (R) with respect to standard inner product.	2 Marks	L1	CO4

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Determine rank of matrix $A = \begin{bmatrix} 0 & 0 & 1 & 3 \\ 2 & 4 & 0 & -8 \\ 1 & 2 & 1 & -1 \end{bmatrix}$ by reducing to Echelon form.	8 Marks	L1	CO1
	b)	Evaluate the solution of the following system of linear equations **x+y+z = 6, 2x+y-z = 1, -x+2y+2z = 9,** by applying elementary	8 Marks	L3	CO1

transformations.

(OR)

3		Apply factorization method to solve the system of equations $3x+2y+7z=4$, $2x+3y+z=5$ and $3x+4y+z=7$.	16 Marks	L3	CO1

MODULE-II

4.	a)	Determine the Eigen values and Eigen vectors of the matrix $A = \begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$.	8 Marks	L1	CO2
	b)	Verify $A = \begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$ satisfies Cayley Hamilton theorem or not ?	8 Marks	L3	CO2

(OR)

5.		Show that the matrix $A = \begin{bmatrix} 3 & 0 & 2 \\ 6 & 4 & 3 \\ -4 & 0 & -3 \end{bmatrix}$ is Diagonize	16 Marks	L3	CO2

MODULE-III

6.	a)	Show that the set $V=\{(a_1, a_2)/a_1, a_2 \text{ in } R\}$ forms a vector space over R w.r.t operations defined by $(a_1,a_2)+(b_1,b_2) = (a_1+b_1, a_2+b_2)$ and $c(a_1,a_2)-(ca_1,ca_2)$where (a_1,a_2) and (b_1,b_2) in V and c in R.	8 Marks	L3	CO3
	b)	Express the vector (1,-2,5) is linear combination of vectors (1, 1, 1), (1,2,3) and (2, -1, 1).	8 Marks	L3	CO3

(OR)

7.	a)	Verify the vectors (1, 2, 1), (2, 1, 0) and (1,-1,2) forms a basis or not for R^3 ?	8 Marks	L3	CO3
	b)	Show that the vectors (1, 3, 2) (1, -7,-8) and (2, 1,-1) of $V_3(R)$ are linear dependent.	8 Marks	L3	CO3

MODULE-IV

8.	a)	Verify T: $V_3(R)$ to $V_2(R)$ defined by $T(x_1, x_2, x_3)=(x_1-x_2, x_1+x_3)$ is linear transformation or not?	8 Marks	L3	CO3
	b)	Determine range, rank and nullity for the linear transformation T: R^3 to R^3 defined by $T(x, y, z)=(x+2y, y-z, x+2z)$.	8 Marks	L3	CO3

(OR)

9.	a)	Let T: R^3 to R^3 be a linear transformation defined by $T(x_1, x_2, x_3)=(3x_1, x_1-x_2, 2x_1+x_2+x_3)$. Verify T is invertible or not If T is Invariable, find inverse of T.	8 Marks	L3	CO3
	b)	If T: $R^3 \rightarrow R^3$, is a linear transformation defined by $T(x_1, x_2, x_3)=(3x_1+x_3, -2x_1+x_2, -x_1+2x_2+4x_3)$. Find matrix of T in the basis$\{(1,0,0), (0,1,0), (0,0,1)\}$.	8 Marks	L3	CO3

MODULE-V

10.		Define Inner product space and If $\alpha=(a_1, a_2)$, $\beta=(b_1,b_2)$ in $V_2(R)$, then show that $<\alpha, \beta> = a_1b_1-a_2b_1-a_1b_2+4a_2b_2$ be an inner product over V_2(R).	16 Marks	L3	CO4

(OR)

11.		Apply the Gram-Schmidt process to the vectors [(2,1,3), (1,2,3). (1,1,1)] to obtain orthonormal basis for $V_3(R)$with standard inner product.	16 Marks	L3	CO4

CODE No.: 22MM101402 MBU-22

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Regular Examinations December – 2022

MULTIVARIABLE CALCULUS AND DIFFERENTIAL EQUATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	If $x = r\cos\theta$, $y = r\sin\theta$, $z = z$ *then find* $\frac{\partial(x,y,z)}{\partial(r,\theta,z)}$.	2 Marks	L1	CO1
	b)	Find $\frac{\partial^2 f}{\partial x \partial y}$ *if* $f(x,y) = \tan^{-1}(xy)$.	2 Marks	L1	CO1
	c)	Evaluate $\int_0^1 \int_0^{\sqrt{1+x^2}} \frac{dydx}{1+x^2+y^2}$.	2 Marks	L5	CO2
	d)	Write down the limits for function $f(x.y) = xy$ over the region in the positive quadrant for which $x + y \le 1$.	2 Marks	L1	CO2
	e)	If $\varphi = 3x^2y - y^3z^2$, *find grad* φ *at the point* $(1,-2,-1)$.	2 Marks	L1	CO3
	f)	Verify that the vector $V = 2xyz\,i + (x^2z + 2y)\,j + x^2y\,k$ *is irrotational.*	2 Marks	L1	CO3
	g)	Solve $(D^4 + 2D^2 + 1)y = 0$, *where* $D \equiv \frac{d}{dt}$.	2 Marks	L4	CO4
	h)	State the general form of the Legendre's linear differential equation of third order.	2 Marks	L1	CO4
	i)	Solve $\sqrt{p} + \sqrt{q} = 1$.	2 Marks	L3	CO5
	j)	Form the partial differential equation from $z = ax + by + a^2 + b^2$.	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Given that $u = xy + yz + zx$, $v = x^2 + y^2 + z^2$ and $w = x + y + z$ then determine whether there is a functional relationship between u, v and w and if so, find it.	8 Marks	L2	CO1
	b)	Examine $f(x,y) = x^3 + y^3 - 3xy$ for its maximum and maximum values.	8 Marks	L2	CO1

(OR)

3.	a)	Expand $e^x \cos y$ near the point $\left(1, \frac{\pi}{4}\right)$ by Taylor's theorem.	8 Marks	L2	CO1
	b)	A rectangular box, which is open at the top, has a capacity of 256 cubic feet. Determine the dimensions of the box such that the least material is required for the construction of the box. Use Lagrange's method of multipliers to obtain the solution.	8 Marks	L2	CO1

MODULE-II

4.	a)	Change the order of integration in $I = \int_0^{\infty}\int_x^{\infty} \frac{e^{-y}}{y}\,dx\,dy$ and then evaluate it.	8 Marks	L3	CO2
	b)	Find by double integration the area enclosed by the pair of curves $y^2 = 4ax$ *and* $x^2 = 4ay$.	8 Marks	L2	CO2

(OR)

5.	a)	Evaluate $\int_0^{2\pi}\int_0^{\frac{\pi}{4}}\int_0^{a} r^2 \sin\theta \; dr\, d\theta\, d\phi$.	8 Marks	L5	CO2
	b)	Find the volume bounded by the cylinder $x^2 + y^2 = 4$ *and the planes* $y + z = 3$ *and* $z = 0$.	8 Marks	L2	CO2

MODULE-III

6.	a)	Find the directional derivative of the scalar point $f(x, y, z) = x^2 + xy + z^2$ at the point A (1,-1,-1) in the direction of the line AB, where B has the co-ordinates (3,2.1) .	8 Marks	L2	CO3
	b)	Using Stoke's theorem, evaluate $\int_c \left[(2x - y)\,dx - yz^2\,dy - y^2 z\,dz\right]$ where C is the circle $x^2 + y^2 = 1$ corresponding to the surface of the sphere.	8 Marks	L4	CO3

(OR)

7.	a)	Determine whether the line integral $\int_c \left[\, 2xyz^2\,dx + (x^2z^2 + z\cos yz)\,dy + (2x^2yz + y\cos yz)\,dz \,\right]$ is the independent of the path of integration.	8 Marks	L2	CO3
	b)	Using Green's theorem, evaluate $\int_c \left[(x^2 + xy)\,dx + (x^2 + y^2)\,dy\right]$, where C is the square formed by the lines $x = \pm 1,\ y = \pm 1$.	8 Marks	L4	CO3

MODULE-IV

8.	a)	Solve $(D^2 - 5D + 6)y = e^x \cos 2x,\ where\ D \equiv \frac{d}{dx}$.	8 Marks	L2	CO4
	b)	Apply the method of variation of parameters, solve $\frac{d^2y}{dx^2} - y = \frac{2}{1 + e^x}$.	8 Marks	L4	CO4

(OR)

9.	a)	Solve $x^2 \frac{d^2y}{dx^2} + x\frac{dy}{dx} + y = \sin(\log x^2)$.	8 Marks	L2	CO4
	b)	Solve $(D^2 - 6D + 13)y = 8e^{3x}\sin 4x,\ where\ D \equiv \frac{d}{dx}$.	8 Marks	L4	CO4

MODULE-V

10.	a)	Form the partial differential equation of all planes which are at a constant distance 'a' from the origin.	8 Marks	L3	CO5
	b)	Solve $(x^2 - yz)p + (y^2 - zx)q = (z^2 - xy)$.	8 Marks	L3	CO5

(OR)

11.	a)	Form the partial differential equation by eliminating the arbitrary functions from $z = f(x + at) + g(x - at)$.	8 Marks	L2	CO5
	b)	Apply the method of separation of variables, solve $\frac{\partial^3 z}{\partial x^2 \partial y} = \cos(2x + 3y)$.	8 Marks	L2	CO5

CODE No.: 22MM101403 MBU-22

Reg. No. | | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Regular Examinations, December – 2022

CALCULUS AND TRANSFORMATION TECHNIQUES

[Computer Science and Engineering (Artificial Intelligence and Machine Learning),

Computer Science and Engineering (Data Science),

Computer Science and Engineering (Cyber Security)]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	State Rolle's theorem.	2 Marks	L1	CO1
	b)	State Maclaurin's theorem with Lagrange's form of reminder	2 Marks	L1	CO1
	c)	Find the first and second partial derivatives of $f(x)= ax^2 + 2h\,xy + by^2$.	2 Marks	L1	CO2
	d)	Identify the stationary points of the function $f(x, y)=2-x^2-y^2$.	2 Marks	L1	CO2
	e)	Find the Laplace transform of $e^{2t} + 2\sin 3t$.	2 Marks	L1	CO3
	f)	Obtain the Laplace transform of $t^2 + at + b$	2 Marks	L1	CO3
	g)	Find the inverse Laplace transform of $\frac{1}{s^2 + 16}$	2 Marks	L1	CO4
	h)	Find the inverse Laplace transform of $\frac{1}{(s-1)(s+2)}$	2 Marks	L1	CO4
	i)	Obtain the Fourier coefficient a_0 for the function $f(x) = e^{ax}$ in $(0, 2\pi)$	2 Marks	L1	CO5
	j)	Determine the Fourier cosine transform of $f(x) = e^{-ax}$ for $x \geq 0$.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Verify Cauchy's mean value theorem for $f(x) = x^2$, $g(x) = x^3$ in [1,2].	8 Marks	L4	CO1
	b)	Obtain Maclaurin's series expansion of the function $f(x) = e^x$.	8 Marks	L4	CO1
		(OR)			
3.	a)	Verify Rolle's theorem for the function $f(x) = (x - a)^m (x - b)^n$ where m and n are positive integers in [a, b].	8 Marks	L4	CO1
	b)	Show that for $0<a<b<1$, $\frac{1}{1+a^2} > \frac{\tan^{-1}b - \tan^{-1}a}{b-a} > \frac{1}{1+b^2}$.	8 Marks	L4	CO1

MODULE-II

4.	a)	If $U=\log(x^2+y^2+z^2)$, then find $\frac{\partial^2 U}{\partial x^2} + \frac{\partial^2 U}{\partial y^2} + \frac{\partial^2 U}{\partial z^2}$.	8 Marks	L4	CO2
	b)	Verify that the functions $u = xy + yz + zx$, $v = x^2 + y^2 + z^2$ and $w = x + y + z$ are functionally dependent? If so find the relation between them.	8 Marks	L5	CO2

(OR)

5.	a)	Find the minimum distance from the origin to the plane $x + 2y + 3z = 14$ using Lagrange's method of multipliers.	10 Marks	L4	CO2
	b)	If u=$\frac{yz}{x}$ v = $\frac{zx}{y}$, w=$\frac{xy}{z}$, then compute $\frac{\partial(u,v,w)}{\partial(x,y,z)}$	6 Marks	L4	CO2

MODULE-III

6.	a)	Find the Laplace transform of $\frac{e^{-at} - e^{-bt}}{t}$	8 Marks	L2	CO3
	b)	Obtain L(t^2e^{-2t}cost)	8 Marks	L4	CO3

(OR)

7.	a)	Using Laplace transform, evaluate $\int_0^\infty \frac{\sin 2t}{t} dt$	8 Marks	L2	CO3
	b)	Find the Laplace transform of the square wave function of period 2a defined as $f(t) = \begin{cases} k & when\ 0 < t < a \\ -k & when\ a < t < 2a \end{cases}$	8 Marks	L4	CO3

MODULE-IV

8.	a)	Find $L^{-1}\left[\frac{s+2}{s^2-2s+5}\right]$	8 Marks	L2	CO4
	b)	Using convolution theorem find $L^{-1}\left[\frac{1}{s(s^2+4)}\right]$	8 Marks	L2	CO4

(OR)

9.	a)	Evaluate $L^{-1}\left[\frac{s^2}{(s+1)(s+2)(s+3)}\right]$	8 Marks	L2	CO4
	b)	Find the inverse Laplace transform of $\log\left(\frac{s+3}{s+4}\right)$	8 Marks	L2	CO4

MODULE-V

10.	a)	Obtain the Fourier series for x^2 in the interval $-\pi < x < \pi$. Hence show that 1- $\frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \frac{1}{5^2} \ldots\ldots = \frac{\pi^2}{12}$	8 Marks	L4	CO5
	b)	Find the Fourier transform of $f(x) = \begin{cases} 1 & \text{for } \lvert x \rvert < a \\ 0 & \text{for } \lvert x \rvert > a \end{cases}$	8 Marks	L2	CO5

(OR)

11.	a)	Find the half-range Sine series for the following function $f(x) = x(\pi - x)$ *for* $0 \le x \le \pi$	8 Marks	L2	CO5
	b)	Find the Fourier sine transform of f(x)= $e^{-\lvert x \rvert}$ and hence deduce $\int_0^\infty \frac{x \sin mx}{1+x^2} dx = \frac{\pi e^{-m}}{2}, m > 0.$	8 Marks	L4	CO5

CODE No.: 22MM102452 MBU-22

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Regular Examinations, December – 2022

ENGINEERING PHYSICS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 X 2 = 20 Marks

1.	a)	Define Interference	2 Marks	L1	CO1
	b)	Outline Superposition principle of light.	2 Marks	L2	CO1
	c)	State divergence of electric field	2 Marks	L1	CO2
	d)	Define numerical aperture of an optical fiber	2 Marks	L1	CO2
	e)	State P-type semi conductor.	2 Marks	L1	CO3
	f)	Outline Drift current	2 Marks	L2	CO3
	g)	Define non-polar dielectric material	2 Marks	L1	CO4
	h)	Outline magnetization and magnetic field strength.	2 Marks	L1	CO4
	i)	Outline the role of cooper pairs in superconductivity.	2 Marks	L2	CO5
	j)	State nano materials.	2 Marks	L1	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Explain the theory of Newton's rings with relevant diagram.	12 Marks	L2	CO1
	b)	In a Newton's rings experiment the diameter of the 10^{th} ring changes from 1.52 to 1.10 cm when the liquid is introduced between the lens and plate. Calculate the refractive index of the liquid.	4 Marks	L3	CO1
		(OR)			
3.	a)	Obtain the condition for primary maxima in Fraunhofer diffraction due to single slit and derive an expression for width of the central maxima.	12 Marks	L2	CO1
	b)	Differentiate Interference and diffraction.	4 Marks	L3	CO1

MODULE-II

4.	a)	Explain the physical significance of gradient, divergence and curl.	8 Marks	L2	CO2
	b)	Explain Fiber optic Sensor.	8 Marks	L2	CO2
		(OR)			
5.	a)	Explain step index and graded index fiber with neat illustrations.	10 Marks	L2	CO2
	b)	Discuss construction of an optical fiber.	4 Marks	L2	CO2

MODULE-III

6.	a)	Explain the term Hall effect. Calculate the hall coefficient and carrier concentration.	10 Marks	L3	CO3
	b)	Explain the role of Fermi energy level in p-type semiconductor.	4 Marks	L2	CO3
		(OR)			
7.	a)	Describe the construction and working of Semi conductor diode laser with neat illustrations.	10 Marks	L3	CO3
	b)	Discuss the role of direct band gap semiconductors in obtaining laser.	4 Marks	L2	CO3
		MODULE-IV			
8.	a)	Interpret electronic and ionic polarizations with neat illustrations.	12 Marks	L3	CO4
	b)	Explain orientation polarization with neat diagram.	6 Marks	L2	CO4
		(OR)			
9.	a)	Explain the origin of magnetic moment and obtain the relation for Bohr Magneton.	8 Marks	L2	CO4
	b)	Illustrate B-H curve and write inferences from it.	8 Marks	L3	CO4
		MODULE-V			
10.	a)	Discuss BCS theory of super conductivity.	10 Marks	L2	CO5
	b)	Write short notes on flux quantization.	6 Marks	L1	CO5
		(OR)			
11.	a)	Explain how the electrical, magnetic and mechanical properties of nano materials vary with their size.	10 Marks	L2	CO5
	b)	Discuss the basic principle of nano materials.	6 Marks	L2	CO5

CODE No.: 22MM102453 MBU-22

Reg. No. | | | | | | | | | | | |

MOHAN BABU UNIVERSITY

SREE SAINATH NAGAR, TIRUPATI - 517 102, ANDHRA PRADESH

B.Tech I Semester (MBU-22) Regular Examinations December – 2022

PHYSICS FOR COMPUTING

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 100**

PART - A

Answer All Questions.
All Questions Carry Equal Marks

10 x 2 = 20 Marks

1.	a)	Define plane polarized light.	2 Marks	L1	CO1
	b)	List out any two differences between CPL and EPL.	2 Marks	L1	CO1
	c)	List out any two de Broglie's hypothesis for matter waves.	2 Marks	L1	CO2
	d)	Compute the wavelength associated with an electron, which has been accelerated from rest on application of a potential of 200V.	2 Marks	L2	CO2
	e)	Formulate the wave function of the particle, which is moving in a 3D potential box.	2 Marks	L3	CO3
	f)	Explain the formation of energy bands using band theory of solids.	2 Marks	L2	CO3
	g)	State drift velocity.	2 Marks	L1	CO4
	h)	Briefly explain the compound semiconductors.	2 Marks	L1	CO4
	i)	State and explain the critical angle.	2 Marks	L1	CO5
	j)	Compute the numerical aperture of an optical fiber refractive indices of the core and the cladding are 1.52 and 1.48 respectively.	2 Marks	L3	CO5

PART - B

Answer One Question from each Module.
All Questions Carry Equal Marks

5 X 16 = 80 Marks

MODULE-I

2.	a)	Why newton's rings are in circular shape? Derive the expression for wavelength of monochromatic source using Newton's rings experiment.	10 Marks	L2	CO1
	b)	List out any four differences between Half wave and Quarter wave plate.	6 Marks	L2	CO1
		(OR)			
3.	a)	Why do soap bubbles appear multicolored when viewed under sun light?	6 Marks	L2	CO1
	b)	Explain the construction and working of Nicol prism and show that it can be act as a polarizer and analyzer.	10 Marks	L2	CO1

MODULE-II

4.	a)	List out de Broglie's hypothesis for matter waves.	6Marks	L1	CO2
	b)	Illustrate Fermi Dirac distribution and effect of temperature.	10 Marks	L2	CO2
		(OR)			
5.	a)	Derive the expression for de Broglie wavelength for electron.	6 Marks	L2	CO2
	b)	Explain the confirmation of dual nature of matter waves using any one experiment.	10Marks	L2	CO2

MODULE-III

6.	a)	State and explain eigen value and eigen function.	6 Marks	L2	CO3
	b)	Show that eigenvalues of an electron are in the ratio of 1 : 4 : 9 : 16 ….. , when the electron moves in a one-dimensional potential box of width 'L' along with its eigen function.	10 Marks	L3	CO3

(OR)

7.	a)	An electron is bound in a one-dimensional box of width 2×10^{-10} m. Find its lowest energy and first excited state energy.	6 Marks	L3	CO3
	b)	Illustrate the Kronig-Penny model and list out the conclusions (P=0, P is moderate and P tends to infinite).	10 Marks	L3	CO3

MODULE-IV

8.	a)	Write any four differences between direct and indirect band gap of semiconductors.	6 Marks	L1	CO4
	b)	Explain the density of charge carriers in p-type and n-type semiconductors and draw the band diagrams of p-type and n-type semiconductors.	10 Marks	L2	CO4

(OR)

9.	a)	Explain the electrical conductivity of intrinsic semiconductors.	6 Marks	L2	CO4
	b)	State Hall effect and derive an expression for the Hall coefficient (R_H) and carrier concentration (n).	10 Marks	L3	CO4

MODULE-V

10.	a)	State and explain the total internal reflection in optical fibers.	6 Marks	L1	CO5
	b)	Explain the construction and working mechanism of a temperature sensor and displacement sensor.	10 Marks	L3	CO5

(OR)

11.	a)	Briefly explain any four applications of optical fibers.	6 Marks	L2	CO5
	b)	Derive the expression for acceptance angle and also explain the how to reduce the intermodal dispersion using graded index optical fibers.	10 Marks	L3	CO5

CODE No.: 16BT1BS01 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations, December 2022

ENGINEERING CHEMISTRY

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Discuss briefly about boiler troubles and methods to be adapted for their treatment.	14 Marks
		(OR)	
2		Explain the Ion-Exchange process for softening of water with the reactions involved and mention the advantages, disadvantages of this process.	14 Marks

UNIT-II

3	a)	Define composite material? Classify composite materials based on dispersed phase.	7 Marks
	b)	Distinguish between fibre and particle-reinforced composites.	7 Marks
		(OR)	
4		What are biodegradable polymers? Explain the classification of Biodegradable polymers. Give the potential applications of biodegradable polymers.	14 Marks

UNIT-III

5		Write the applications of nanomaterials in science and technology.	14 Marks
		(OR)	
6		Explain in detail about the classification of nanomaterials	14 Marks

UNIT-IV

7		Describe the construction and working of Lithium- ion battery with the reactions occurring during charging and discharging. Mention the applications of Li-ion batteries.	14 Marks
		(OR)	
8		Discuss the construction and working principle of Ni-Cd battery. List out the applications of Ni-Cd batteries	14 Marks

UNIT-V

9		Define lubrication. Explain mechanism of fluid and boundary lubrication	14 Marks
		(OR)	
10		What is lubrication? Write an explanatory note on solid lubricants and greases.	14 Marks

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

TRANSFORMATION TECHNIQUES AND PARTIAL DIFFERENTIAL EQUATIONS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1 Develop the Fourier series for $f(x) = x - x^3$ in $-3 < x < 3$. 14 Marks

(OR)

2 Test the function $f(x) = \begin{cases} 1+\frac{2x}{\pi} & -\pi < x < 0 \\ 1-\frac{2x}{\pi}; & 0 < x < \pi \end{cases}$ for even and odd. 14 Marks

Also find its half range Fourier cosine series.

UNIT-II

3 Apply Parseval's identity in Fourier transforms evaluate $\int_0^\infty \frac{dx}{(4+x^2)(9+x^2)}$. 14 Marks

(OR)

4 Find the Fourier sine transform of $e^{-|x|}$ hence evaluate $\int_0^\infty \frac{x \sin mx}{a^2 + x^2} dx$. 14 Marks

UNIT-III

5 Solve $y'' + 9y = \cos 2t$, $y(0) = 1$, $y(\pi/2) = -1$ by Laplace technique. 14 Marks

(OR)

6 Solve $y'' - 5y' + 4y = e^{2t}$, $y(0) = 1$, $y'(0) = 0$, using Laplace transform method. 14 Marks

UNIT-IV

7 Using Z–transform, Solve $u_{n+2} - 2u_{n+1} + u_n = 3_{n+5}$. 14 Marks

(OR)

8 Solve the equation $y_{n+2} + 6y_{n+1} + 9y_n = 2^n$ with $y_0 = y_1 = 0$, Using Z-transform. Solve the equation $y_{n+2} + 6y_{n+1} + 9y_n = 2^n$ with $y_0 = y_1 = 0$, Using Z–transform? 14 Marks

UNIT-V

9 Obtain the solution of the equation $\frac{\partial u}{\partial t} = \frac{\partial^2 u}{\partial x^2}$ with boundary condition $u(x,0) = 3\sin n\pi x$, $u(0,t), u(l,t) = 0$ where $0 < x < l$. 14 Marks

(OR)

10 A string is stretched and fastened to two points l apart. Motion is started by displacing the string in the form $y = a \sin \frac{\pi x}{l}$ from which it is released at a time t=0. Show that the displacement of any point at a distance x from one end at time t is given by $y(x,t) = a \sin\left(\frac{\pi x}{l}\right)\cos\left(\frac{\pi ct}{l}\right)$. 14 Marks

❀ ❀ ❀

CODE No.: 16BT20102 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations, December 2022

ENGINEERING MECHANICS

[Civil Engineering and Mechanical Engineering]

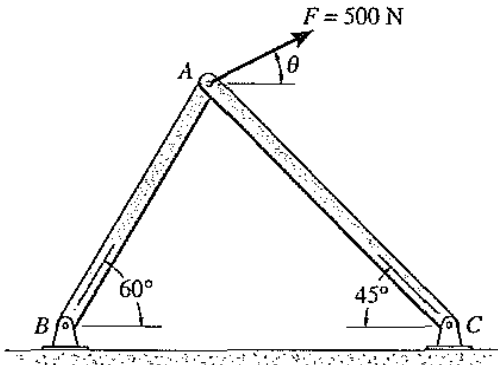
Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Discuss the following terms with suitable examples: 7 Marks
i) Coplanar forces ii) Concurrent forces
iii) Parallel forces iv) Non parallel forces

b) The 500N force acting on the frame is to be resolved into two components acting along the axis of the struts AB and AC as shown in Fig. If the component of force along AC is required to be 300 N, directed from A to C, determine the magnitude of force acting along AB and the angle q of the 500 N forces. 7 Marks



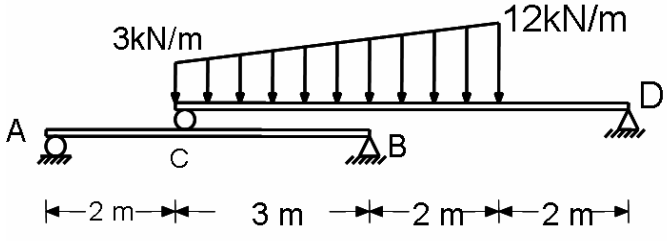
(OR)

2 a) Explain how the Parallelogram law can be used to obtain the resultant of more than two concurrent forces. 7 Marks

b) What is a resultant force? What is meant by composition of forces, component of a force and resolution of a force? Can a force be resolved into non-perpendicular components? If so, how? 7 Marks

UNIT-II

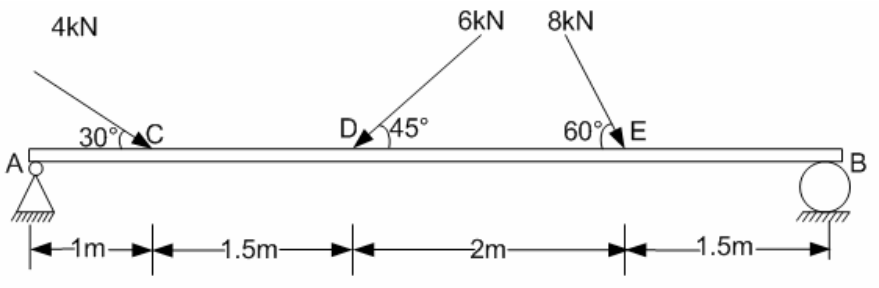
3 Calculate reactions at A, B, C and D as shown in the given figure. 14 Marks



(OR)

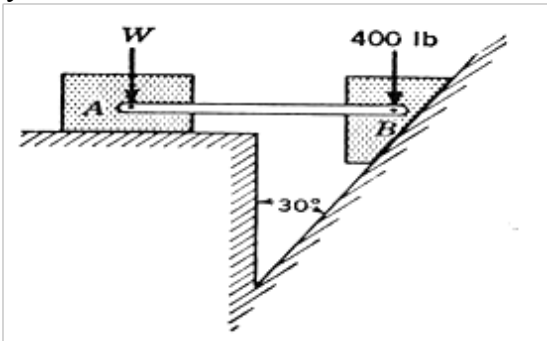
4 a) State and prove Varignon's principle. 7 Marks

b) A beam AB of span 6m is hinged at A and supported on rollers at end B and carries load as shown in Fig. Determine the reactions at A and B. 7 Marks



UNIT-III

5 Two blocks, connected by a horizontal link AB are supported on two rough planes as shown in figure. The coefficient for friction of block A on the horizontal plane is μ = 0.4. The angle of friction for block B on the inclined plane is μ =0.15. What is the smallest weight W of block A for which equilibrium of the system can exist? 14 Marks



(OR)

6 A uniform ladder of length 5m and weight 250N rests on a horizontal ground and leans against a rough vertical wall. The coefficient of static friction between ladder and the floor is 0.3 and between the ladder and vertical wall is 0.2. When a weight of 900 N is placed on the ladder at a distance of 2 m from the top of the ladder, the ladder is at the point of sliding. Determine: 14 Marks

i) The angle made by the ladder with the horizontal.

ii) Reactions at the foot and top of the ladder.

UNIT-IV

7 Find the area moment of inertia about the centroidal axes of the plane area shown in fig. Also find the section modulus. 14 Marks

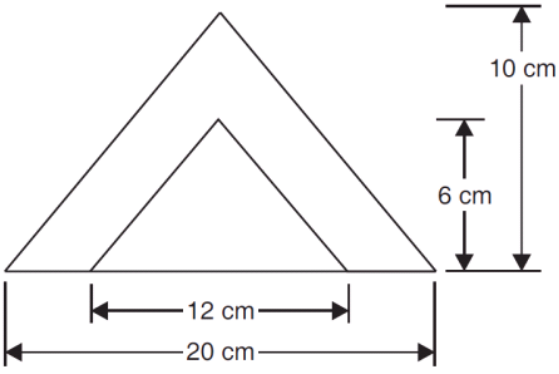
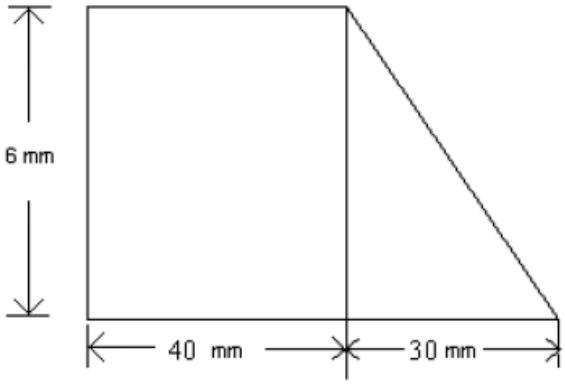


Fig.7

(OR)

8 Find the centroid of the plane area shown in figure 14 Marks



UNIT-V

9 a) A stone dropped into well is heard to strike the water in 3.5 sec. Find the depth of the well assuming the velocity of the sound is 335 m/sec. 7 Marks

b) Maximum range of a field gun is 2000 m. If a target at a distance of 1200 m is to be hit, what should be the angle of projection? 7 Marks

(OR)

10 a) A motor cycle starts from rest and speeds to 15 m/s with a constant acceleration of 1.5 m/s^2 runs at this speed for some time and finally comes to rest with a deceleration of 2 m/s^2. If total distance travelled is 400 m, determine total time required. 7 Marks

b) The motion of the particle is defined by the relation $x = 6t^4 + 8t^3 - 14t^2-10t + 16$, where x and t are expressed in meters and records, respectively. Determine the position, the velocity, and the acceleration as the particle when t = 3s. 7 Marks

❁ ❁ ❁

CODE No.: 16BT20241 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations, December-2022

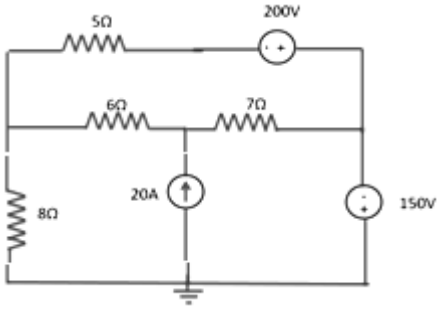
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
[Civil Engineering, Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

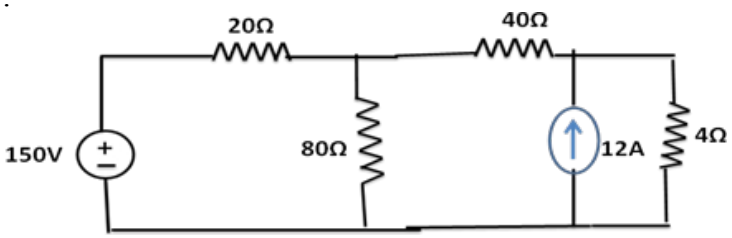
Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1 a) Compute the voltage across the 7 Ω resistor, using mesh analysis. 7 Marks

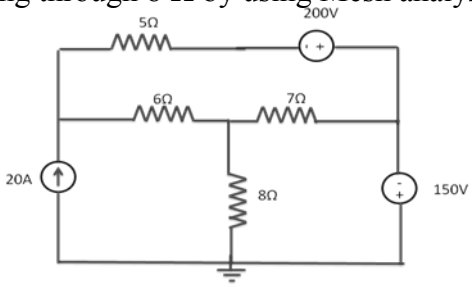


b) Use Nodal analysis to determine the current through 40 Ω resistor in the circuit given below. 7 Marks

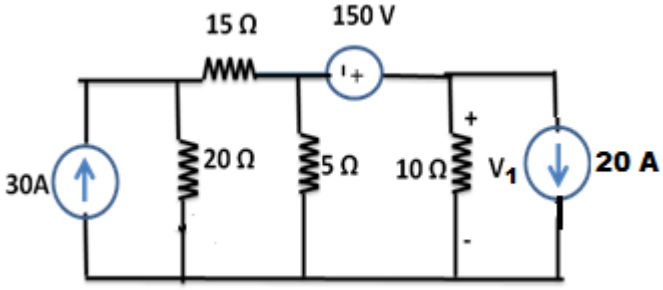


(OR)

2 a) Find the current flowing through 8 Ω by using Mesh analysis. 7 Marks



b) Compute the voltage across 10 Ω resistor V_1, using nodal analysis. 7 Marks



UNIT-II

3 A 64 mH inductor with a 700 Ω winding resistance is connected in series with a 3.3 kΩ resistor. A 10 V RMS, 5 kHz supply is applied to the circuit. Calculate the RMS value of circuit current and voltage across resistor and inductor. 14 Marks

(OR)

4	a)	A series RC circuit with R = 120 Ωand C = 3.3 μF is connected to a 12 V RMS, 1 kHz supply. Determine the circuit current, the resistor voltage, the capacitor voltage and the phase angle of the current with respect to the supply voltage. Represent the phasor diagram and impedance triangle for the circuit.	7 Marks
	b)	A coil have inductance 32 mH and resistance of 600 Ω is connected in series with 2.4 kΩ resistor. The series combination circuit was excited by 30 V RMS, 1 kHz supply. Compute the current delivered by source and voltage across resistor in coil. Also compute the power drawn from source.	7 Marks

UNIT-III

5	a)	Build a diagram of DC Machine and label the component parts. State the functions of each part.	7 Marks
	b)	The armature of 6 – pole DC generator has a wave winding containing 664 conductors. Compute the generator EMF when flux per pole is 0.06 webers and the speed is 250 rpm. At what speed must be run to generate EMF of 250 V, if the flux per pole is reduced to 0.058 webers.	7 Marks
		(OR)	
6	a)	Explain the construction and working principle of DC Generator.	7 Marks
	b)	An 8 pole DC generator has flux of 40 mWb per pole and winding is connected in lap winding with 960 conductors. Calculate the generated EMF on open circuit when it runs at 400 rpm. If the armature is wave wound at what speed must the machine be driven to generate the same voltage.	7 Marks

UNIT-IV

7	a)	What are the different types of temperature measurements? Explain.	8 Marks
	b)	State the need for transducer, explain.	6 Marks
		(OR)	
8	a)	State the difference between active and passive transducers.	7 Marks
	b)	How does thermo couple works, state the applications of thermo couples in industry.	7 Marks

UNIT-V

9	a)	Explain the operation of single phase half wave diode rectifier with neat waveforms.	6 Marks
	b)	Single phase half-wave diode rectifier is connected to 220 V, 50 Hz supply to feed 5 Ω pure resistors. Draw load voltage and current and diode voltage drop waveforms along with supply voltage. Then, calculate i) The rectification efficiency. ii) Ripple factor of load voltage and iii) Peak Inverse Voltage (PIV) of the diode.	8 Marks
		(OR)	
10	a)	Define current gains α and β. How are they related?	6 Marks
	b)	Draw I - V characteristics (Collector characteristics) for a transistor and discuss the salient features.	8 Marks

❀ ❀ ❀

CODE No.: 16BT20401 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations, December 2022

ELECTRONIC DEVICES AND CIRCUITS

[Electrical and Electronics Engineering, Electronics and Communication Engineering and Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1 a) Draw and explain the V-I characteristics of Zener diode. 7 Marks

b) A voltage of 500 cos ωt is applied to half wave rectifier with load resistance of 5kΩ. Define and derive the values of maximum DC voltage component, R.M.S. current, Ripple Factor, Transformer Utilization Factor, PIV and Rectifier Efficiency of the rectifier. 7 Marks

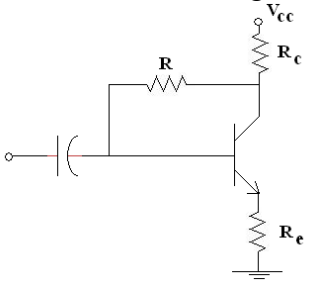
(OR)

2 a) Distinguish between avalanche and Zener mechanisms. 7 Marks

b) Derive an expression for transition capacitance. 7 Marks

UNIT-II

3 a) In the circuit shown, V_{cc} = 24V, R_c = 10K and R_e = 270Ω. If a silicon transistor is used with β = 45 and if V_{CE} = 5V, find R. Neglect reverse saturation current. 6 Marks



b) Explain the output characteristics of a transistor in CB configuration. 8 Marks

(OR)

4 a) Explain CE configuration with the help of input and output characteristics. 8 Marks

b) Explain Collector –to-base bias method and derive the expression for the stability factor. 6 Marks

UNIT-III

5 a) Derive the expressions for voltage gain, current gain, input impedance output impedance of CE amplifier, using exact and approximate model. 9 Marks

b) Draw the h-parameter model of CE configuration. 5 Marks

(OR)

6 a) Why hybrid parameters are called so? Draw the hybrid model of transistor indicating all the parameters. 5 Marks

b) A CE amplifier is driven by a voltage source of internal resistance R_s=1000 Ω and the load impedance of R_L = 1200Ω. The h–parameters are h_{ie} = 1.2 kΩ, h_{re}=2 × 10^{-4}, h_{fe} = 60 and h_{oe} = 25 μA/v. Compute the current gain, input resistance, voltage gain and output resistance using exact analysis. 9 Marks

UNIT-IV

7	a)	Explain how an FET is used as a voltage variable resistor.	6 Marks
	b)	Explain the operation of MOSFET in enhancement mode.	8 Marks
		(OR)	
8	a)	Why we call FET as A voltage controlled device?	6 Marks
	b)	What are the values of I_D and g_m for V_{GS} = -1.5V if I_{DSS} and V_P are given as 8.4mA and -3V respectively.	8 Marks

UNIT-V

9	Draw the electrical equivalent circuit of UJT and explain its operation with emitter characteristics.	14 Marks
	(OR)	
10	Explain the characteristics of tunnel diode with the help of energy band diagram.	14 Marks

CODE No.: 16BT20441 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations, December 2022

BASIC ELECTRONIC DEVICES AND CIRCUITS

[Computer Science and Engineering, Information Technology and Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1 Derive the following terms for Half wave rectifier 14 Marks
i) DC Ammeter ii) DC Voltmeter
iii) Wattmeter iv) Regulation.

(OR)

2 a) Derive the Ripple factor for Half wave rectifier and full wave rectifier. 8 Marks
b) Derive the L Section filter in full wave rectifier. 6 Marks

UNIT-II

3 a) Draw a self bias circuit. Explain why such a circuit is an improvement on the fixed bias circuit as for as stability concerned. 10 Marks
b) A BJT has base current of 200 uA and emitter current of 20 mA Determine the collector current and beta. 4 Marks

(OR)

4 a) Why is the need of stabilizing an operating point? How is it done? 10 Marks
b) A BJT has base current of 400 uA and emitter current of 50 mA Determine the collector current and beta. 4 Marks

UNIT-III

5 a) Draw the small signal model of JFET. 10 Marks
b) A FET amplifier in the common source configuration uses a load resistance of 250 K ohms and the transconductance is 0.5 mA/V. What is the voltage gain of the amplifier given drain resistance is 200 K Ohms. 4 Marks

(OR)

6 a) Explain the enhancement MOSFET with neat sketches. 10 Marks
b) What are the two types of MOSFET How do they differ in their structure? 4 Marks

UNIT-IV

7 a) Draw the circuit of Colpitts oscillator and explain its working. Derive the expression for frequency of oscillation. 10 Marks
b) In colpitts oscillator C_1=0.16 uF, L =15.8 mH and its frequency of oscillation is 10 K Hz, Calculate the value of capacitor C_2. 4 Marks

(OR)

8 a) Draw the circuit of RC phase shift oscillator and explain its working. Derive the expression for frequency of oscillation. 10 Marks
b) In a RC phase shift oscillator, if its frequency of operation is 955 Hz and R1=R2= R3 =680 K ohms, find the value of capacitor. 4 Marks

UNIT-V

9 a) Explain the difference between UJT and a Conventional BJT. 7 Marks
b) Explain the VI characteristics of UJT. 7 Marks

(OR)

10 Explain the principle of operation and characteristics of Varactor diode. 14 Marks

❀ ❀ ❀

CODE No.: 16BT20541 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations, December-2022

FOUNDATIONS OF DATA STRUCTURES

[Electrical and Electronics Engineering, Electronics and Communication Engineering and Electronics and Instrumentation Engineering]

Max. Marks: 70

Time: 3 hours

Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1	a)	Illustrate a non recursive, in-place version of the quick-sort algorithm. The algorithm should still be based on the same divide-and-conquer approach, but use an explicit stack to process sub problems.	7 Marks
	b)	What is divide and conquer strategy? State three steps of Merge sort.	7 Marks
		(OR)	
2		Explain the divide and conquer methodology. Suggest a pseudo code for merge sort and analyze its complexities. Trace algorithm on the data <8, 4, 1, 6, 7, 2, 3, 9>.	14 Marks

UNIT-II

3	a)	Find infix and postfix expressions for the following prefix expression and explain the steps in detail. *-AB+*CD/EF.	7 Marks
	b)	Explain the implementation of circular queue using array. How an "empty queue" is distinguished from a "full queue"? Write necessary functions to perform all valid operations on circular queue.	7 Marks
		(OR)	
4	a)	Enumerate and describe briefly the various applications of Stacks and Queues.	5 Marks
	b)	Explain the terms infix expression, prefix expression, and postfix expression. Convert the following infix expression to their postfix equivalents: 14 / 7 * 3 - 4 + 9 / 2.	5 Marks

UNIT-III

5	a)	Write routines to implement the operations INSERT, DELETE, and SEARCH for circular linked lists.	7 Marks
	b)	Write the insert ( ) and find ( ) routines for Single Linked List.	7 Marks
		(OR)	
6	a)	Write the delete () routines for Single Linked List and Circular Linked List.	7 Marks
	b)	Form a linked list to store student's details. Give the advantages and uses of a circular linked list.	7 Marks

UNIT-IV

7		Show the result of inserting <3, 1, 4, 6, 9, 2, 5, 7> into an initially empty binary search tree. Show the result of deleting the root. Explain the different tree traversals for the resultant tree by giving algorithms and running times.	14 Marks
		(OR)	
8	a)	Insert into an empty AVL tree with keys 30, 40, 24, 58, 48, 26, 11, 13. Draw the tree after each insertion.	7 Marks
	b)	Insert the keys 90, 20, 70, 11, 16, 15, 1 into the empty Binary Search Tree in this order. Draw the tree once after the keys 11 is inserted, then again after 1 is inserted.	7 Marks

UNIT-V

9	a)	Given an adjacency-list representation of a directed graph, how long does it take to compute the out-degree of every vertex? How long does it take to compute the in-degrees?	7 Marks
	b)	What is the significance of Hashing over linear and binary search?	7 Marks

(OR)

10	a)	Give adjacency list and adjacency matrix representations for a full binary search tree formed by inserting the elements <3, 1, 5, 2, 0, 4, 6>. Can a tree can be Graph?	7 Marks
	b)	Write a program to find the topological order of a digraph G represented as adjacency lists. If a stack is used instead of a queue, does a different ordering result? Illustrate with an example.	7 Marks

CODE No.: 16BT21201 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations, December 2022

OBJECT ORIENTED PROGRAMMING THROUGH C++

[Computer Science and Engineering, Information Technology and Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Discuss the idea of message passing with objects.	14 Marks
		(OR)	
2		Explain the features of reference variables.	14 Marks

UNIT-II

3	a)	What is an inline function? What are the advantages of having a function inline?	8 Marks
	b)	Write a C++ program to find cube of a number using inline function.	6 Marks
		(OR)	
4		Write a function using reference variables as arguments to swap the values of a pair of integers.	14 Marks

UNIT-III

5		Define sorting. Implement Bubble sort algorithm using arrays.	14 Marks
		(OR)	
6	a)	Define Pointer. How is the Reference operator helpful in a program?	7 Marks
	b)	Explain the purpose of Dereference operator with a suitable example?	7 Marks

UNIT-IV

7	a)	What is function overriding? Explain with an example?	5 Marks
	b)	What is operator overloading? Write a C++ program to compare two values representing distance in feet and inches, using overloading operator >.	9 Marks
		(OR)	
8		Write a C++ program to add and multiply two complex numbers. Initialize the variables through writing constructor. Implement add and multiply operations using overloaded + and * operators.	14 Marks

UNIT-V

9		What are the steps involved in using a file in a C++ program.	14 Marks
		(OR)	
10		Explain about container classes in C++, with a suitable example.	14 Marks

CODE No.: 16BT21501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-16) Supplementary Examinations, December-2022

DIGITAL LOGIC DESIGN

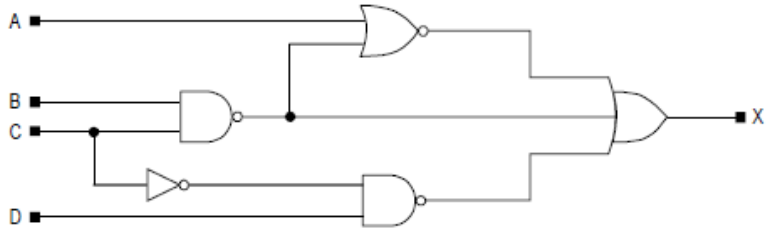
[Computer Science and Engineering, Information Technology and Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1 a) Write the logic expression and simplify it as much as possible and draw a logic diagram that implements the simplified expression. 8 Marks



b) Represent the given decimal number 8620 in BCD code, Excess-3 code and as a binary number. 6 Marks

(OR)

2 a) Verify that the following operations are commutative and associative 6 Marks
i) AND ii) EX-OR

b) Most calculators use BCD to store the decimal values as they are entered into the keyboard and to drive the digit displays. 8 Marks
i) If a calculator is designed to handle 8 – digit decimal numbers, how many bits does this require?
ii) What bits are stored when the number 375 is entered into the calculator?

UNIT-II

3 a) Draw a logic diagram using only two-input NAND gates to implement the following expression: 7 Marks
$F = (AB + A'B)(CD' + C'D)$

b) Implement the following Boolean function F together with the don't care conditions d using no more than two NOR gates. Assume that both the normal and complement inputs are available. 7 Marks
$F(A,B,C,D) = \Sigma m(0,1,2,9,11)$
$d(A, B, C, D) = \Sigma(8,10,14,15)$

(OR)

4 a) Realize EX-NOR using minimum number of NOR gates. 7 Marks

b) Draw a NAND logic diagram that implements the complement of the following function: $F(A, B, C, D) = \Sigma(0,1,2,3,4,8,9,12)$. 7 Marks

UNIT-III

5 a) Implement the following function with 8×1 multiplexer 6 Marks
$F(A, B, C, D) = \Sigma m\ (0, 1, 3, 4, 8, 9, 15)$

b) Design a combinational circuit, that multiplies an input decimal digit represented in BCD by 5. The output is to be represented in BCD. Show that the outputs can be obtained from the input lines without using any logic gates. 8 Marks

(OR)

6	a)	A combinational circuit is specified by the following three Boolean functions: $F_1 = \Sigma m(0, 3, 4)$; $F_2 = \Sigma m(1, 2, 7)$; $F_3 = \Pi M(0, 1, 2, 4)$ Implement the circuit with a decoder and external OR gates.	8 Marks
	b)	Draw the circuit of 1×4 demultiplexer using NAND gates.	6 Marks

UNIT-IV

7	a)	Design a mod-8 ripple counter using positive edge triggered JK flip-flops.	7 Marks
	b)	Illustrate the operation of 3 bit Ring counter and plot the output waveforms.	7 Marks
		(OR)	
8	a)	Design a Mod 5 synchronous counter using JK flip-flops.	8 Marks
	b)	The contents of a serial-in/serial-out shift register are DCBA = 0101, where A is the least significant digit of the register. A serial input 10011 is moved into the shift register, from left to right, most significant bit first, by five successive clock pulses. Draw time diagrams showing how the outputs of the four flip-flops vary with time during the period of the five clock pulses.	6 Marks

UNIT-V

9		Design an Excess-3 to BCD code converter using PLA.	14 Marks
		(OR)	
10	a)	Realize the following functions using PROM of size 8×3. $F_1 = \Sigma m(0, 4, 7)$; $F_2 = \Sigma m(1, 3, 6)$; $F_3 = \Sigma m(1, 2, 4, 6)$	8 Marks
	b)	Explain ROM organization.	6 Marks

CODE No.: 19BT1BS02 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

BIOLOGY FOR ENGINEERS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		What is a living organism? What are the differences between prokaryotes and eukaryotes?	12 Marks	L1	CO1	PO1
		(OR)				
2.	a)	How living organisms obtain energy from their carbon sources? Classify them.	6 Marks	L2	CO1	PO1
	b)	Explain the cellular basis of life.	6 Marks	L2	CO1	PO1

UNIT-II

3.		What is bio-molecule? Enlist the classification of carbohydrates, proteins and Nucleic acids.	12 Marks	L1	CO1	PO1
		(OR)				
4.	a)	Define Enzyme. Summarize the industrial applications of bacterial enzymes.	8 Marks	L1	CO1	PO5
	b)	What are nucleic acids in biology?	4 Marks	L2	CO1	PO1

UNIT-III

5.		Explain about Mendelian Laws of inheritance. What is genetic code and how is it read?	12 Marks	L2	CO2	PO1
		(OR)				
6.		What are Replication, Transcription and Translation? Explain with diagrams.	12 Marks	L2	CO2	PO1

UNIT-IV

7.		What is the role of Recombinant DNA technology in transgenic microbes and plants? Explain with examples.	12 Marks	L2	CO3	PO6
		(OR)				
8.	a)	What is Biosensor and Biochip? How does it work?	6 Marks	L3	CO3	PO1
	b)	What are the advantages of recombinant vaccines and how they are made?	6 Marks	L4	CO3	PO6

UNIT-V

9.	a)	What is the purpose of a microarray? Give an example of a real world application of microarray analysis?	6 Marks	L1	CO3	PO1
	b)	How do neurons know which neurotransmitter to release? Explain.	6 Marks	L2	CO1	PO1
		(OR)				
10.		How would you describe the human digestive system? Give a detailed diagram.	12 Marks	L1	CO1	PO1

CODE No.: 19BT1BS03 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations, December 2022

ENGINEERING PHYSICS

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	What are Newton's rings? Describe and explain the formation of Newton's rings. Derive the expression for the wavelength of monochromatic light.	10 Marks	L2	CO1	PO1
	b)	A soap film of refractive index 1.33 and thickness 5000 Å is exposed to white light. What wavelength in the visible region is reflected?	2 Marks	L1	CO1	PO2
		(OR)				
2.	a)	Describe the construction and working of Nicol's prism.	7 Marks	L2	CO1	PO1
	b)	Explain the theory of plane transmission grating.	5 Marks	L2	CO1	PO1
		UNIT-II				
3.		Write Maxwell equations. Discuss the equation of electromagnetic wave in dielectric medium and hence evaluate the velocity of light in free space.	12 Marks	L2	CO2	PO1 PO2
		(OR)				
4.	a)	Define the acceptance angle and numerical aperture. Derive an expression for the numerical aperture of an optical fiber.	9 Marks	L3	CO2	PO2
	b)	Calculate the angle of acceptance of given optical fiber, if the refractive indices of the core and the cladding are 1.563 and 1.498 respectively.	3 Marks	L3	CO2	PO2
		UNIT-III				
5.	a)	Derive an expression for the electron concentration in an intrinsic semiconductor.	9 Marks	L3	CO3	PO1 PO2
	b)	Find the diffusion coefficient of electron in silicon at 300K, if μ_e is 0.19 $m^2/V\text{-}s$.	3 Marks	L1	CO3	PO2
		(OR)				
6.	a)	State and explain the Hall effect. Obtain an expression for the Hall coefficient of a given semiconductor specimen.	9 Marks	L2	CO3	PO1
	b)	The Hall coefficient of a specimen is 3.66×10^{-4} m^3C^{-1}. Its resistivity is 8.93×10^{-3} Ω-m, find carrier density.	3 Marks	L1	CO3	PO2
		UNIT-IV				
7.	a)	Describe the frequency dependence of polarization.	7 Marks	L2	CO4	PO1
	b)	What is piezoelectricity? List its applications.	5 Marks	L1	CO4	PO1
		(OR)				
8.	a)	Summarize the ferromagnetic hysteresis loop.	6 Marks	L2	CO4	PO1
	b)	Distinguish soft and hard magnetic material. Explain their properties.	6 Marks	L4	CO4	PO1
		UNIT-V				
9.	a)	Illustrate the AC and DC Josephson effect.	6 Marks	L2	CO5	PO1
	b)	Describe the BCS theory of Super conductivity.	6 Marks	L2	CO5	PO1
		(OR)				
10.	a)	List out applications of nanomaterial's.	4 Marks	L1	CO5	PO1
	b)	Explain the synthesis of nanomaterial's using PLD method.	8 Marks	L2	CO5	PO1

❀ ❀ ❀

CODE No.: 19BT2BS01 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

TRANSFORMATION TECHNIQUES AND LINEAR ALGEBRA

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Express $f(x)$ as a Fourier series in (-2,2) — 6 Marks — L3 — CO1 — PO1

If $f(x) = \begin{cases} 2, & if \ -2 < x < 0 \\ 0, & if \ \ 0 < x < 2 \end{cases}$

b) Establish Fourier sine transform for the function $\frac{e^{-ax}}{x}$. — 6 Marks — L1 — CO1 — PO2

(OR)

2. a) Using Fourier integral, Show that — 4 Marks — L3 — CO1 — PO2

$$e^{-ax} - e^{-bx} = \frac{2(b^2 - a^2)}{\pi} \int_0^\infty \frac{\lambda \sin \lambda x}{(\lambda^2 + a^2)(\lambda^2 + b^2)} d\lambda .$$

b) Show that the Fourier cosine transform of — 8 Marks — L1 — CO1 — PO1

$$f(x) = \begin{cases} x, & for \ 0 < x < 1 \\ 2 - x, & for \ 1 < x < 2 \\ 0, & for \ x > 2 \end{cases} \quad is \ \frac{2}{p^2} \cos p (1 - \cos p).$$

UNIT-II

3. a) Determine $L\left\{\frac{1 - \cos at}{t}\right\}$. — 6 Marks — L3 — CO1 — PO1

b) Find the Laplace transform of $e^{-3t} \int_0^t \frac{\sin t}{t} dt$. — 6 Marks — L1 — CO1 — PO2

(OR)

4. a) Find the Laplace transform of the square wave function defined by — 6 Marks — L1 — CO1 — PO1

$$f(t) = \begin{cases} 1, & if \ 0 < t < a \\ 1, & if \ \frac{a}{2} < t < a \end{cases} \text{ with period } a .$$

b) Using Laplace transform, Show that $\int_0^\infty t^2 e^{-4t} \sin 2t \, dt = \frac{11}{500}$. — 6 Marks — L3 — CO1 — PO2

UNIT-III

5.	a)	Find the inverse Laplace transform of $\log\left(\frac{1+s}{s^2}\right)$.	6 Marks	L1	CO1	PO1
	b)	Apply convolution theorem to evaluate $L^{-1}\left[\frac{s}{(s^2+1)^2}\right]$.	6 Marks	L3	CO1	PO2
		(OR)				
6.		Using Laplace transform, solve the differential equation $(D^2 + n^2)\,y = a \sin(nt + 2)$, *given that* $y(0) = 0,\ y'(0) = 0$.	12 Marks	L3	CO1	PO2

UNIT-IV

7.		Determine the Eigen values and corresponding Eigen vectors of the matrix $A = \begin{bmatrix} 2 & 2 & 0 \\ 2 & 5 & 0 \\ 0 & 0 & 3 \end{bmatrix}$.	12 Marks	L3	CO2	PO1
		(OR)				
8.	a)	Find the rank of matrix $A = \begin{bmatrix} 8 & 1 & 3 & 6 \\ 0 & 3 & 2 & 2 \\ -8 & -1 & -3 & 4 \end{bmatrix}$ by reducing it to echelon form.	6 Marks	L1	CO2	PO1
	b)	Find the orthogonal transformation which transforms the quadratic form $2x^2 + 2y^2 + 2z^2 - 2xy - 2yz - 2zx$ to the canonical form**.**	6 Marks	L1	CO2	PO2

UNIT-V

9.	a)	Examine whether the set of vectors $\begin{bmatrix} 1 \\ 1 \\ 0 \end{bmatrix}, \begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix}$ *and* $\begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix}$ is linearly independent or not.	6 Marks	L4	CO2	PO2
	b)	Show that the transformation $T: R^2 \to R^3$ defined by $T\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} x \\ 2x - y \\ 3x + 4y \end{bmatrix}$ is linear.	6 Marks	L2	CO2	PO1
		(OR)				
10.	a)	Show that the vectors $\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}, \begin{bmatrix} -1 \\ 0 \\ 1 \end{bmatrix}$ *and* $\begin{bmatrix} 4 \\ 9 \\ 7 \end{bmatrix}$ form a basis of $R^3(R)$.	6 Marks	L2	CO2	PO1
	b)	Show that the linear transformation $T: R^2 \to P_1$ defined by $T\begin{bmatrix} a \\ b \end{bmatrix} = a + (a + b)x$ is one-to-one and onto, where P_1 is a vector space of all linear polynomial over real field.	6 Marks	L2	CO2	PO2

CODE No.: 19BT10501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations, December 2022

PROGRAMMING FOR PROBLEM SOLVING

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Describe the efficiency of algorithms with suitable examples.	6 Marks	L2	CO1	PO1
	b)	List and explain about the data types in Python.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Write a short notes on : i) Implicit line joining ii) Explicit line joining	6 Marks	L1	CO1	PO1
	b)	Define variable. Explain identifier rules.	6 Marks	L1	CO1	PO1

UNIT-II

3.	a)	Write a python script to find whether the given number is perfect number or deficient number or abundant number.	6 Marks	L3	CO1	PO2
	b)	Display the following pattern using Python script. 11111 1111 111 11 1	6 Marks	L3	CO1	PO2
		(OR)				
4.	a)	Write a python script to print list of prime numbers within a range.	6 Marks	L3	CO1	PO2
	b)	Specify the usage of pass, break and continue statements.	6 Marks	L2	CO1	PO1

UNIT-III

5.	a)	Compose a Python script to perform matrix multiplication.	6 Marks	L3	CO1	PO2
	b)	Write a Python script to count the number of vowels, consonants and so on Expected Output: Enter a line of string: adfslkj34 34lkj34334lk Vowels: 1 Consonants: 11 Digits: 9 White spaces: 1	6 Marks	L3	CO1	PO3
		(OR)				
6.	a)	Write a python script to search a key element in the given list of elements.	6 Marks	L3	CO1	PO2
	b)	Illustrate any four set operation functions with an example program.	6 Marks	L2	CO1	PO1

UNIT-IV

7.	a)	Discuss in detail about return statement in python with an example.	6 Marks	L2	CO2	PO1
	b)	Develop a python script to copy data from one file to another file.	6 Marks	L3	CO2	PO2
		(OR)				
8.	a)	Differentiate global keyword and globals() function with an example.	6 Marks	L2	CO2	PO1
	b)	List and explain any four built-in functions in numpy.	6 Marks	L1	CO2	PO1

UNIT-V

9.	a)	Discuss in detail about how to read data from CSV files.	6 Marks	L3	CO2	PO2
	b)	List the steps to create data frame from dictionary with an example.	6 Marks	L3	CO2	PO2
		(OR)				
10.	a)	Consider data frame contains student marks information. Write a Python script to display student details whose marks <60.	6 Marks	L3	CO2	PO3
	b)	Write a Python script to print information and frequency counts of a data set.	6 Marks	L3	CO2	PO2

CODE No.: 19BT20101 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations, December-2022

CIVIL ENGINEERING MATERIALS AND CONCRETE TECHNOLOGY

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Briefly explain the geological classification of rocks.	6 Marks	L2	CO1	PO1
	b)	Mention the factors to be considered while deciding a quarry site.	6 Marks	L1	CO1	PO1 PO8
		(OR)				
2.	a)	Illustrate the various methods used in manufacturing of bricks.	6 Marks	L2	CO1	PO1
	b)	Discuss briefly about the types of tiles.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	List and explain the various methods of seasoning of timber.	6 Marks	L2	CO1	PO1 PO2 PO5
	b)	Discuss the various materials used in low cost housing.	6 Marks	L2	CO1	PO1 PO2
		(OR)				
4.	a)	Enumerate the precautionary measures to reduce various defects in timber.	6 Marks	L4	CO1	PO1 PO2
	b)	Write advantages and disadvantages, if waste is used as alternative building material.	6 Marks	L2	CO1	PO1 PO2 PO4
		UNIT-III				
5.	a)	Mention different types of tests on cement. Explain how to conduct normal consistency test on cement.	6 Marks	L3	CO1	PO1 PO2
	b)	List out various types chemical admixtures. How these admixtures are supporting to the environment.	6 Marks	L4	CO1	PO1
		(OR)				
6.	a)	Briefly describe the following tests on aggregates: i) Crushing test ii) Impact test	6 Marks	L4	CO1	PO1
	b)	Write about plasticizers and super plasticizers.	6 Marks	L3	CO1	PO1
		UNIT-IV				
7.	a)	Explain how the measurement of workability of fresh concrete is carried out in laboratory.	6 Marks	L4	CO1	PO1 PO2
	b)	Distinguish Segregation and Bleeding in concrete in detail.	6 Marks	L2	CO1	PO1
		(OR)				
8.	a)	Why compaction is required to concrete? Explain compaction methods by vibration.	6 Marks	L4	CO1	PO1 PO2
	b)	Explain how you estimate the quality of concrete by using ultrasonic pulse velocity test.	6 Marks	L4	CO1	PO1 PO2

UNIT-V

9.	a)	Explain the various factors affecting creep of concrete.	6 Marks	L2	CO1	PO1 PO2
	b)	Explain the determination of the modulus of elasticity of concrete experimentally.	6 Marks	L4	CO1	PO1 PO2 PO4
		(OR)				
10.		Design a M30 concrete mix using IS method of mix design for the following data: i) Maximum size of aggregate: 20 mm (Angular) ii) Workability: 125 mm slump. iii) Quality control: good iv) Type of exposure - Mild (R.C.C) v) Specific Gravity: a) Cement:3.15 b) Sand:2.63 c) CA: 2.66 vi) Water absorption: a) CA - 0.5% b) FA - 1.0% vii) Free surface moisture: a)CA - Nil b) FA - 2.2% viii) Sand confirms to Zone III grading Assume any other data required suitably.	12 Marks	L6	CO2	PO1 PO2 PO3 PO8

CODE No.: 19BT20102 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations, December - 2022

ENGINEERING MECHANICS

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Two forces of magnitude P and Q act at a point. Their resultant is inclined to first, at an angle α and has magnitude R. If the magnitude of the first force is increased by R, determine the angle made by the new resultant with the first force.	6 Marks	L4	CO1	PO1 PO2
	b)	Two forces of magnitude (P+Q) and (P-Q) acting at a point include an angle 2θ. Show that, if their resultant makes an angle α with the bisector of the angle between them, then P tan α = Q tan θ.	6 Marks	L4	CO1	PO1 PO2

(OR)

2.	a)	Define: i) Moment of a force and ii) Couple.	6 Marks	L4	CO1	PO1 PO2
	b)	Determine and locate the resultant R of the forces and one couple acting on the beam as shown in Fig.1.	6 Marks	L4	CO1	PO1 PO2

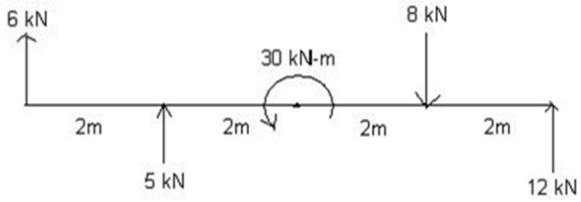


Fig.1

UNIT-II

3.	a)	What is friction? Explain how friction is both desirable and undesirable in engineering applications also state the laws of static and dynamic friction.	6 Marks	L4	CO1	PO1 PO2
	b)	A body of weight 50N is placed on a rough horizontal plane. To just move the body on the horizontal plane, a push of 15N inclined at 30° to the horizontal plane is required. Find the coefficient of friction.	6 Marks	L4	CO1	PO1 PO2

(OR)

4.	a)	What is friction? Explain how friction is both desirable and undesirable in engineering applications also state the laws of static and dynamic friction.	6 Marks	L4	CO1	PO1 PO2

	b)	A body of weight 50N is placed on a rough horizontal plane. To just move the body on the horizontal plane, a push of 15N inclined at 30° to the horizontal plane is required. Find the coefficient of friction.	6 Marks	L4	CO1	PO1 PO2

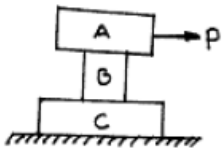


Fig.2

UNIT-III

5.		Find the moment of inertia of the plane area shown in Fig.3. about X and Y axes through its centroid.	12 Marks	L4	CO1	PO1 PO2

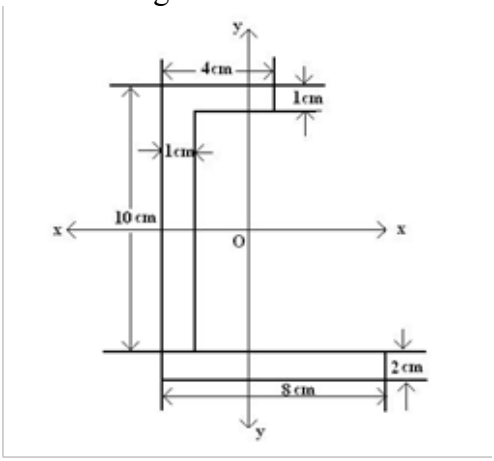


Fig.3

(OR)

6.	a)	State and prove theorems of Pappus–Guldinus.	6 Marks	L4	CO1	PO1 PO2
	b)	Find the centroid of the inverted T section shown in below Fig.4.	6 Marks	L4	CO1	PO1 PO2

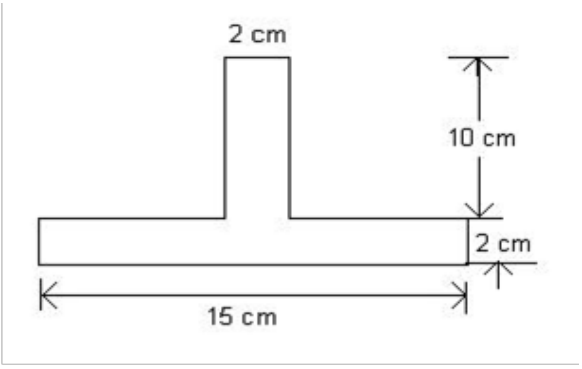


Fig.4

UNIT-IV

7.		A compound bar consist of a central steel strip 25 mm wide and 6.4 mm thick placed between two strips of brass each 25 mm wide and 't' mm thick. The strips are firmly fixed together to form a compound bar of rectangular section 20 mm wide and (2t + 6.4) mm thick. Determine i) The thickness of the brass strips which will make the apparent modulus of elasticity of compound bar $1.57x10^5$ N/mm^2 and ii) the maximum axial pull the bar can then carry if the stress is not to exceed 157 N/mm^2, in either the brass or steel. Take the values of E for steel and brass as $2.07x10^5$ N/mm^2 and $1.14x10^5$ N/mm^2 respectively.	12 Marks	L4	CO1	PO1 PO2
		(OR)				
8.	a)	Derive the expression for the extension of a bar due to its self-weight.	6 Marks	L4	CO1	PO1 PO2
	b)	A rod of steel is 20 m long at a temperature of 20°C. Find the free expansion of the rod when the temperature rises to 65°C. Find the temperature stress produced i) When the expansion of the rod is prevented ii) When the rod is permitted to expand by 5.8 mm. Take $\alpha = 12x10^{-6}$ per°C and E=$2x10^5$ N/mm^2	6 Marks	L4	CO1	PO1 PO2

UNIT-V

9.	a)	A cylindrical water tank of height 25 m, inside diameter 2.2 m, having vertical axis is open at the top. The tank is made up of steel having yield stress of 210 MN/m^2. Determine the thickness of shell used when the tank is full of water.	6 Marks	L6	CO2	PO1 PO2 PO3
	b)	A cylindrical air drum is 2.25 m in diameter with plates 1.2 cm thick. The efficiencies of the longitudinal and circumferential joints are respectively 75 % and 40 %. If the tensile stress in the plating is to be limited to 120 MN/m^2, find the maximum safe air pressure.	6 Marks	L4	CO1	PO1 PO2
		(OR)				
10.		Mention the assumptions in Lame's theory. Derive Lame's equation for radial and circumferential stress of thick cylinder.	12 Marks	L4	CO1	PO1 PO2

CODE No.: 19BT20201 SVEC-19

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations, December-2022

ELECTRIC CIRCUITS

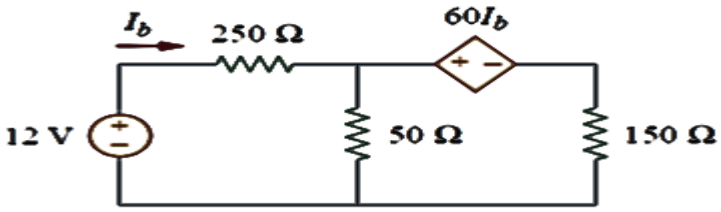
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

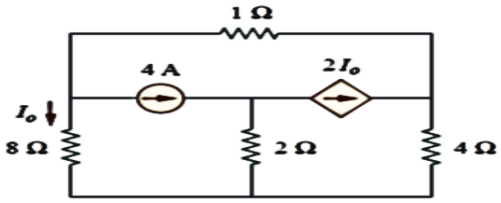
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Determine I_b of the circuit shown in figure using mesh analysis. 6 Marks L4 CO1 PO2

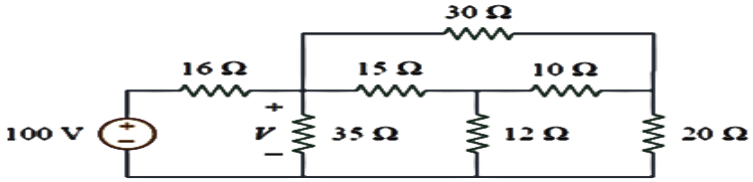


b) Obtain I_0 of the circuit shown in figure. 6 Marks L4 CO1 PO2

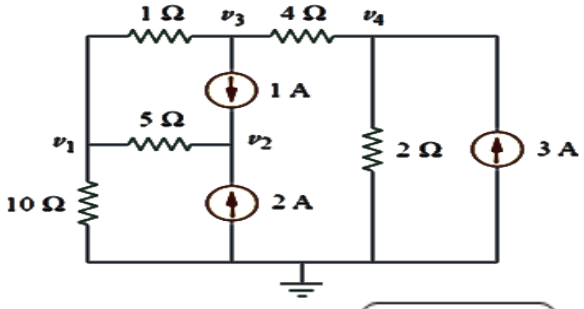


(OR)

2. a) Find the V of the circuit shown in figure. 6 Marks L3 CO1 PO2

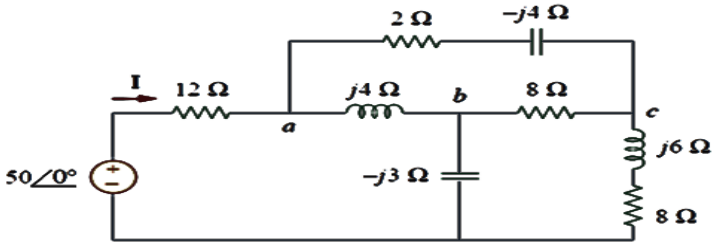


b) Determine the nodal voltages of the circuit shown in figure. 6 Marks L3 CO1 PO2



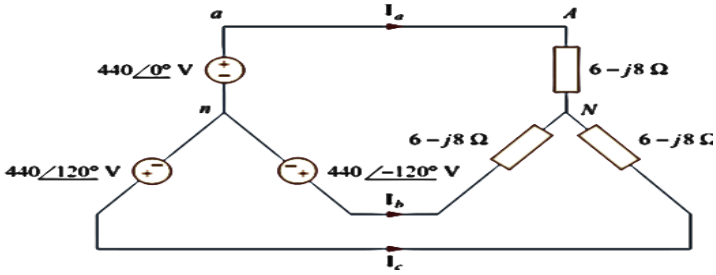
UNIT-II

3. Find total impedance and total power supplied by the source of the circuit shown in figure. 12 Marks L4 CO1 PO2



(OR)

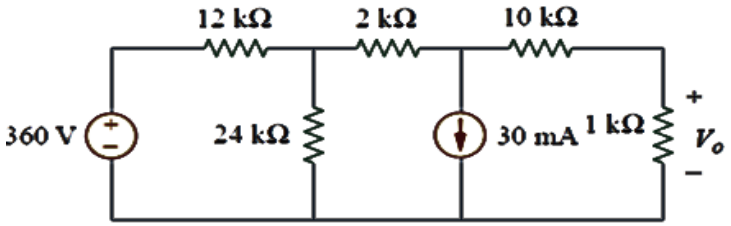
4.	a)	Obtain the line currents in the three-phase circuit shown in figure.	6 Marks	L3	CO1	PO2



	b)	In two wattmeter method the reactive power input is 15 kVAR and P.f. is 0.8 lag. Calculate the total input power of three phase balanced load and each wattmeter reading.	6 Marks	L3	CO1	PO2

UNIT-III

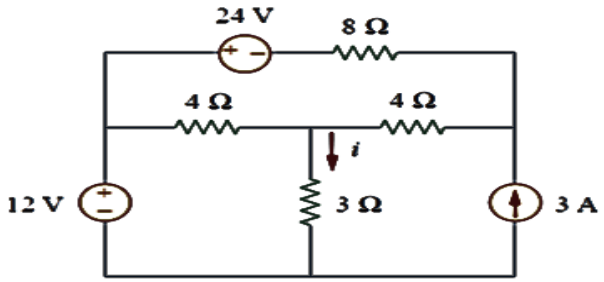
5.	a)	Use Norton's theorem to find V_0 in the circuit shown in figure.	6 Marks	L3	CO1	PO5



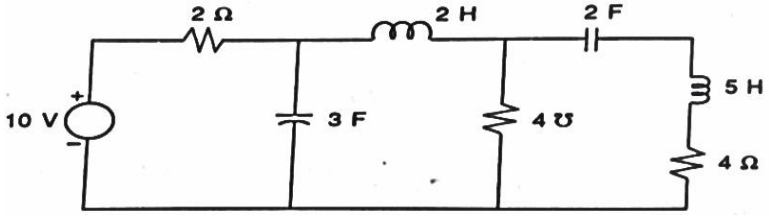
	b)	State and explain Maximum power transfer theorem and derive the necessary conditions for maximum power transfer for AC excitations.	6 Marks	L2	CO1	PO1

(OR)

6.	a)	Find current *i* of the circuit shown in figure using superposition theorem.	6 Marks	L3	CO1	PO5



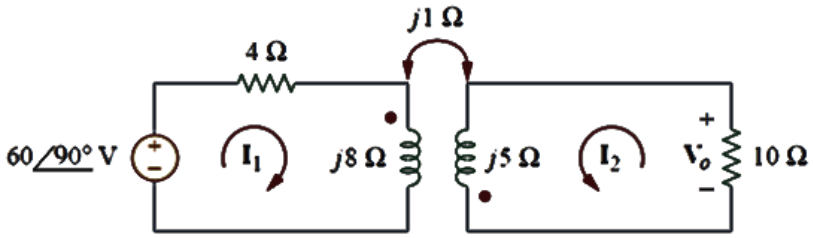
	b)	Construct the dual circuit of the network shown in figure. Mention the procedural steps.	6 Marks	L3	CO1	PO5



UNIT-IV

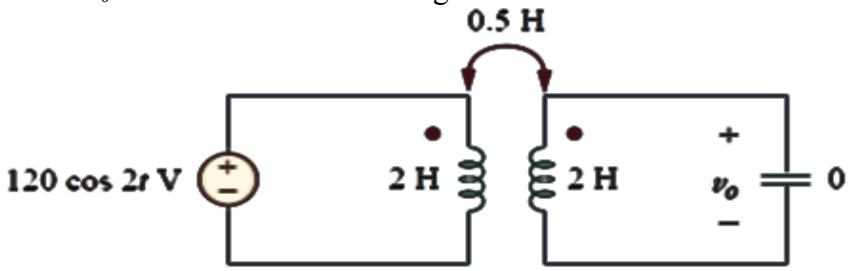
7.	a)	Two coils connected in series-aiding fashion have a total inductance of 250 mH. When connected in a series-opposing configuration, the coils have a total inductance of 150 mH. If the inductance of one coil is three times the other, find self inductances and mutual inductance. What is the coupling coefficient?	6 Marks	L2	CO1	PO1

	b)	Determine the mesh currents of the circuit shown in figure.	6 Marks	L4	CO1	PO2

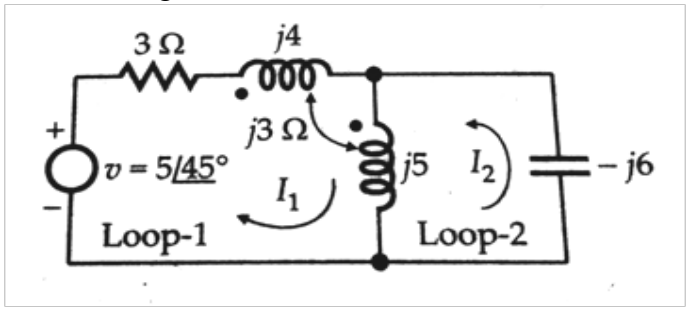


(OR)

8.	a)	Obtain v_0 of the circuit shown in figure.	6 Marks	L4	CO1	PO2



	b)	Find the voltage drop across the capacitor and resistor in the circuit shown in figure.	6 Marks	L4	CO1	PO2



UNIT-V

9.	a)	Define characteristic impedance and derive the characteristic impedance for a *T* and π networks. Also explain the nature of characteristic impedance in pass band and stop bands.	6 Marks	L2	CO1	PO1
	b)	Design a constant- *k* high pass filter to have a cut-off frequency of 2 kHz and a design impedance of 100 Ohms.	6 Marks	L4	CO2	PO3

(OR)

10	a)	Derive the expression for design impedance of a constant-*k* filters	6 Marks	L3	CO1	PO1
.	b)	Design a constant-*k* low pass filter having cut off frequency of 2.5 kHz and design resistance of R_0= 700 Ohms. Also find the frequency at which the filter produces an attenuation of 19.1 dB.	6 Marks	L4	CO2	PO3

CODE No.: 19BT20241 SVEC-19

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations, December-2022

NETWORK ANALYSIS

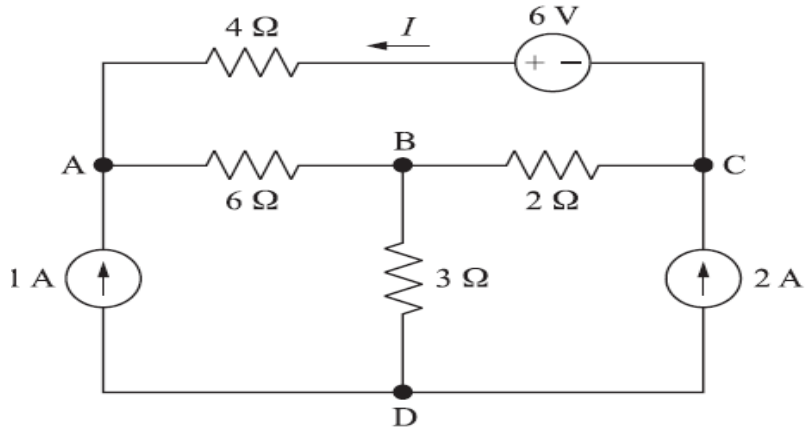
[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

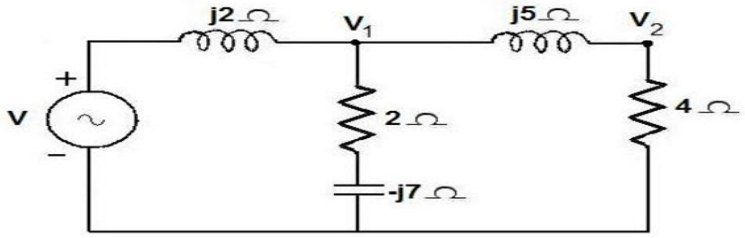
UNIT-I

1.	a)	State Kirchhoff's voltage and current laws.	4 Marks	L1	CO1	PO1
	b)	In the circuit shown in figure, write three node equations for nodes A, B, and C, with node D as the reference, and find the node voltages.	8 Marks	L4	CO1	PO2

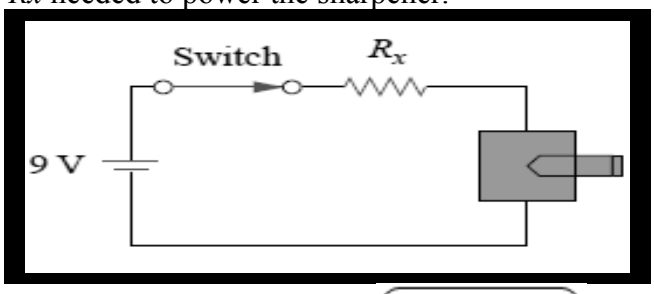


(OR)

2.	a)	Solve for V_1 and V_2 using nodal method. Let V = 100V.	6 Marks	L4	CO1	PO2



	b)	An electric pencil sharpener rated 240 mW, 6 V is connected to a 9-V battery as shown in figure, design the series dropping resistor *Rx* needed to power the sharpener.	6 Marks	L3	CO2	PO3



UNIT-II

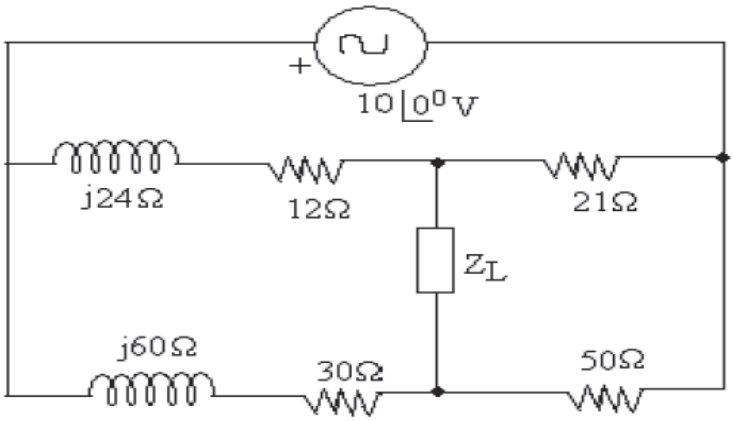
3.	a)	Explain the concept of active, reactive and apparent power and draw the power triangle.	4 Marks	L1	CO1	PO1
	b)	In a TV transmitter, a series circuit has an impedance of 3 k *Ohms* and a total current of 50 mA. If the voltage across the resistor is 80 V, what is the power factor of the circuit?	8 Marks	L3	CO2	PO6

(OR)

4.	a)	Bring out the differences between series and parallel resonance?	4 Marks	L2	CO1	PO1
	b)	A series RLC circuit has R=20 ohm, L=0.005H and C = 0.2 x 10^{-6} F. It is fed from a 100V variable frequency source. Find i) frequency at which current is maximum ii) impedance at this frequency and iii) voltage across inductance at this frequency.	8 Marks	L4	CO1	PO2

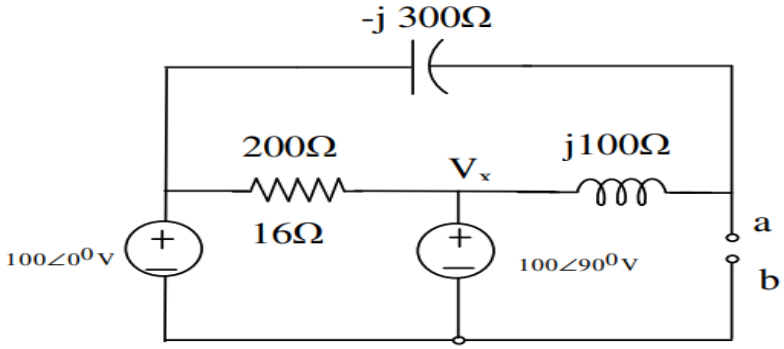
UNIT-III

5.	a)	State and explain the Norton's theorem.	4 Marks	L1	CO1	PO1
	b)	In the network shown in figure, find the value of Z_L so that the power transfer from the source is maximum. Also find P_{max}.	8 Marks	L4	CO1	PO2



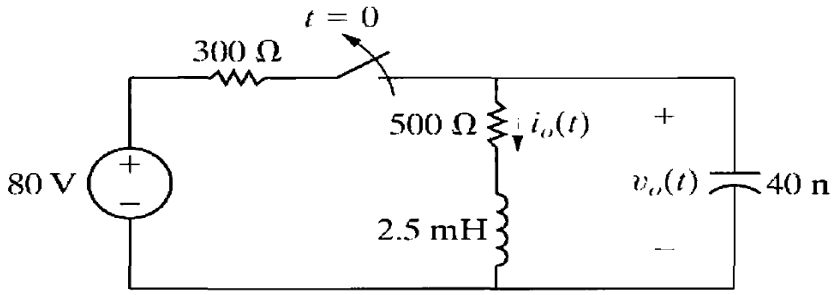
(OR)

6.	a)	State and explain Maximum power transfer theorem and derive the necessary conditions for maximum power transfer for AC excitations.	6 Marks	L2	CO1	PO2
	b)	Find the Thevenin equivalent circuit for the circuit shown below Figure.	6 Marks	L3	CO1	PO5



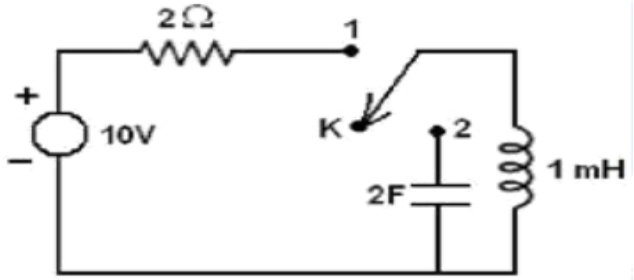
UNIT-IV

7.	a)	Explain the steady state and transient behavior of an inductor.	4 Marks	L1	CO1	PO1
	b)	The switch in the circuit shown in figure has been closed for a long time. The switch opens at t = 0, find $v_0(t)$ and $i_0(t)$ for t>0.	8 Marks	L4	CO2	PO2



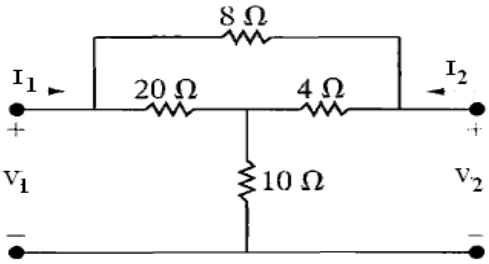
(OR)

8.	a)	Derive the transient response of series R-L-C circuit, with DC excitation using Laplace transform obtain the response for an under damped case.	4 Marks	L3	CO1	PO5
	b)	For the circuit given in figure steady state conditions are reached for the switch K in position '1'. At t = 0, the switch is changed to position 2. Use the time domain method to determine the current through the inductor for all t>0.	8 Marks	L4	CO1	PO2



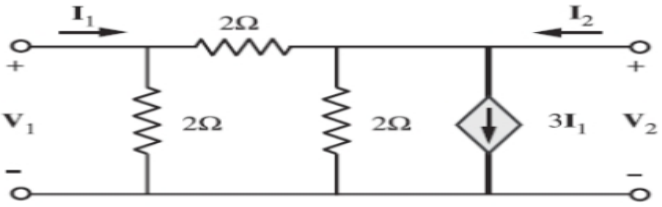
UNIT-V

9.	a)	Y-parameters for a two port network are given as Y_{11}=0.75, Y_{12}=Y_{21}=-0.25, Y_{22}=0.8. Determine the hybrid parameters.	6 Marks	L2	CO1	PO2
	b)	Find the y- Parameters for the circuit shown in the figure.	6 Marks	L4	CO2	PO4



(OR)

10.	a)	Y-parameters for a two port network are given as Y_{11}=0.75, Y_{12}=Y_{21}=-0.25, Y_{22}=0.8. Design an equivalent π-network.	6 Marks	L3	CO2	PO3
	b)	Determin the impedance parameters for the network shown in figure. Invistigate whether the netwok is symmetrical and reciprocal.	6 Marks	L4	CO1	PO2



❀ ❀ ❀

CODE No.: 19BT20301 SVEC-19

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

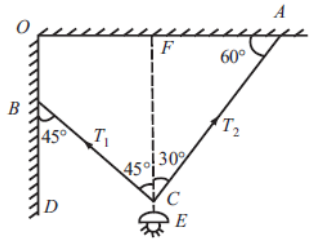
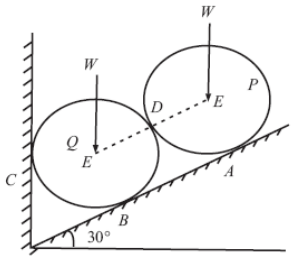
I B.Tech II Semester (SVEC-19) Supplementary Examinations, December-2022

BASIC ENGINEERING MECHANICS
[Mechanical Engineering]

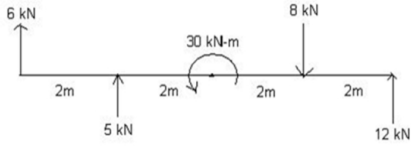
Time: 3 hours **Max. Marks: 60**

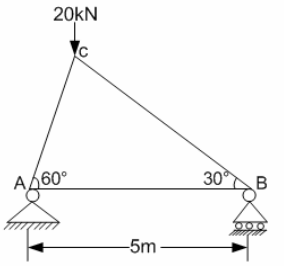
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	An Electric light fixture weighing 15N hangs from a point C, by two strings AC and BC. AC is inclined at 600 to the horizontal and BC at 450 to the vertical as shown in fig. Determine the forces in the strings AC and BC. 	12 Marks	L2	CO1	PO1 PO2
	(OR)				
2.	Two cylindrical identical rollers A and B, each of weight W = 500 N are supported by an inclined plane and vertical wall and makes an angle of 300 with the horizontal as shown in Figure. Assuming all surfaces to be smooth, determine the reactions at A, B and C. 	12 Marks	L2	CO1	PO1 PO2

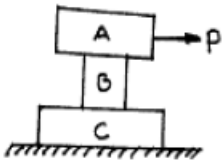
UNIT-II

3.	Determine and locate the resultant R of the forces and one couple acting on the beam as shown in figure. 	12 Marks	L2	CO1	PO1 PO2
	(OR)				
4.	The truss ABC shown in Fig. has a span of 5 m. It is carrying a load of 20 kN at its apex. Find the forces in the members AB, BC and AC, using method of joints. End A is hinged and B is supported on rollers.	12 Marks	L2	CO1	PO1 PO2



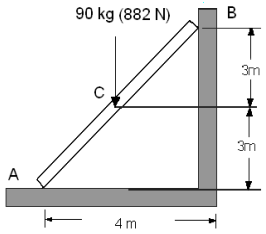
UNIT-III

5.		Find the least horizontal force 'P' to start motion of any part of the system of three blocks resting upon one another as shown in the below figure. The weights of the blocks are A = 3000N, B = 1000N, C =2000N. Between A and B μ= 0.3, between B and C, μ = 0.2 and between C and the ground μ = 0.1.	12 Marks	L2	CO1	PO1 PO2



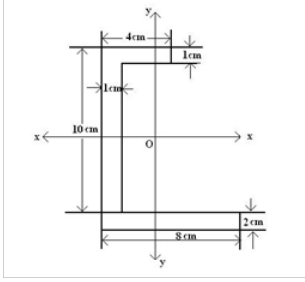
(OR)

6.		A person of mass 90 kg is standing on a ladder at point C, shown in Fig.4. The ladder rests on a rough horizontal floor at A and against a smooth vertical wall at B. If the ladder is just on the point of slipping find the coefficient of friction between the ladder and the floor. Neglect the weight of the ladder. Also find the reactions at A and B.	12 Marks	L2	CO1	PO1 PO2



UNIT-IV

7.		Find the moment of inertia of the plane area shown in figure 7 about X and Y axes through its centroid.	12 Marks	L3	CO2	PO1 PO2



(OR)

8.	a)	State and prove parallel axis theorem for area moment of inertia.	6 Marks	L2	CO2	PO1
	b)	Find the area moment of inertia of the semicircle about centroidal axes.	6 Marks	L2	CO2	PO1

UNIT-V

9.	a)	An aeroplane has a mass of 25000kg and its engines develop a total thrust of 40KN along the run way. The force of air resistance to motion of aeroplane is given by R=2.25V2where 'V' is m/s and R is in Newton. Determine the length of runway required if the plane takes off and becomes airborne at a speed of 240 km/hr.	6 Marks	L2	CO3	PO1 PO2
	b)	Distinguish between rectilinear motion and curvilinear motion.	6 Marks	L2	CO3	PO1

(OR)

10.	a)	Find amplitude and time period of a particle moving with simple harmonic motion, which has a velocity of 9 m/s and 4 m/s at the distance of 2 m and 3 m respectively from the centre.	6 Marks	L2	CO4	PO1 PO2
	b)	Derive the equation for velocity and acceleration of a particle moving with simple harmonic motion.	6 Marks	L2	CO4	PO1

CODE No.: 19BT20302 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations, December - 2022

MATERIAL SCIENCE AND ENGINEERING

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Calculate the atomic packing factor of BCC and FCC structure.	6 Marks	L3	CO1	PO3
	b)	Explain the types of crystal defects with neat sketches.	6 Marks	L2	CO1	PO2
		(OR)				
2.		Derive the expression for the Gibb's Phase rule and recall the Hume Rothery rule.	12 Marks	L3	CO1	PO4
		UNIT-II				
3.	a)	Write short notes on vacuum and plasma hardening.	6 Marks	L1	CO1	PO2
	b)	Explain the concept of time temperature transformation with a neat sketch.	6 Marks	L2	CO1	PO2 PO7
		(OR)				
4.		Define carburizing and describe the types of carburizing in detail.	12 Marks	L1	CO1	PO1
		UNIT-III				
5.	a)	Classify the types of carbon steels with their specific features and applications.	6 Marks	L2	CO2	PO1
	b)	Write a short note on Malleable and Nodular cast iron.	6 Marks	L1	CO2	PO2
		(OR)				
6.		Recall the designations of steels and mention the types, composition, properties and applications of tool steels.	12 Marks	L1	CO2	PO4
		UNIT-IV				
7.	a)	Interpret the composition, features and applications of Titanium and Cobalt materials.	6 Marks	L2	CO2	PO3
	b)	List the properties and applications of Nickel.	6 Marks	L1	CO2	PO1
		(OR)				
8.		What is magnesium? Explain the types, properties and uses of magnesium alloys in detail.	12 Marks	L1	CO2	PO2
		UNIT-V				
9.	a)	Write a brief note on properties and applications of ceramics.	6 Marks	L1	CO2	PO1
	b)	Discuss on the particle reinforced composites, and fiber reinforced composites.	6 Marks	L2	CO2	PO2 PO7
		(OR)				
10.		Tell about hybrid composites and explain the processing of structural composites with neat diagrams.	12 Marks	L1	CO2	PO2 PO7

CODE No.: 19BT20501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations, December-2022

DIGITAL LOGIC DESIGN

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Obtain the truth table of the following functions: i) $(xy + z)(y + xz)$ ii) $Y'z + wxy' + wxz' + w'x'z$	6 Marks	L2	CO1	PO1
	b)	Perform the Subtraction on the following binary numbers using 2's complement. i) 11001 - 10111 ii) 11101 - 01100	6 Marks	L3	CO1	PO1
		(OR)				
2.	a)	Convert the Decimal Number $(2680)_{10}$ in to the following bases. i) Hexa-decimal ii) Octal iii) Binary	6 Marks	L3	CO1	PO1
	b)	Express the following numbers into decimal $(10110.0101)_2$, $(16.5)_{16}$ and $(26.24)_8$	6 Marks	L3	CO1	PO1

UNIT-II

3.	a)	Express the Boolean function $F = xy + x'z$ in a product-of-max terms form.	6 Marks	L4	CO1	PO2
	b)	Draw a logic diagram using only two-input NOR gates to implement the following function. $F(A, B, C, D) = (A \oplus B)' (C \oplus D)$	6 Marks	L4	CO1	PO3
		(OR)				
4.	a)	Simply the following Boolean Expression using three-variable k-maps. $xy + x'y'z' + x'yz'$	6 Marks	L4	CO1	PO2
	b)	Simplify the following Boolean function F, together with the don't-care conditions d, and then express the simplified function in sum-of-minterms form. $F(x, y, z) = \Sigma(0,1, 4, 5, 6)$ $d(x, y, z) = \Sigma(2, 3, 7)$	6 Marks	L4	CO1	PO2

UNIT-III

5.	a)	Implement the following Boolean function with a 16 X 1 multiplexer. $F(A, B, C, D) = \Sigma m(0, 3, 5, 6, 8, 9, 14, 15)$	6 Marks	L4	CO2	PO5
	b)	Design a 4-bit priority encoder.	6 Marks	L4	CO2	PO3
		(OR)				
6.		Design a combinational circuit with three inputs and one output. The output is 1 when the binary value of the inputs is less than 3. The output is 0 otherwise.	12 Marks	L4	CO2	PO4

UNIT-IV

7.	a)	What is a shift register? Explain about the following modes of operations in a four bit shift register: i) shift right ii) shift left iii) bidirectional	6 Marks	L2	CO2	PO1
	b)	Design a clocked D flip-flop with AND and NOR gates. Draw the logic diagram and explain.	6 Marks	L4	CO2	PO4
		(OR)				
8.	a)	What is the difference between a Ripple Counter and a Synchronous Counter? Explain.	6 Marks	L4	CO2	PO2
	b)	Explain about analysis of clocked sequential circuits in detail.	6 Marks	L2	CO2	PO1

UNIT-V

9.	a)	Compare the features of PROM, PLA and PAL.	6 Marks	L4	CO2	PO2
	b)	Draw logic diagram and explain the Internal logic of a 32 X 8 ROM.	6 Marks	L2	CO2	PO1
		(OR)				
10.		Consider the following Boolean functions, given in sum-of-minterms form: $w(A, B, C, D) = \Sigma(2, 12, 13)$ $x(A, B, C, D)=\Sigma(7,8,9, 10, 11, 12, 13, 14, 15)$ $y(A, B, C, D)=\Sigma(0,2,3,4,5, 6, 7, 8, 10, 11, 15)$ $z(A, B, C, D) = \Sigma(1, 2, 8, 12, 13)$ Design a combinational circuit to implement the Boolean functions using a PAL.	12 Marks	L4	CO2	PO4

CODE No.: 19BT21501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech II Semester (SVEC-19) Supplementary Examinations, December - 2022

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the steps involved in creating and executing a java program.	6 Marks	L2	CO1	PO2
	b)	Write about Naming Conventions in Java.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Give the usage of new keyword in Java.	6 Marks	L2	CO1	PO1
	b)	Explain different Java Components.	6 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	Explain about Java Control Statements with examples.	6 Marks	L2	CO1	PO2
	b)	Develop a program to generate a random number between 0 and 100.	6 Marks	L3	CO1	PO3
		(OR)				
4.	a)	Write a Program to count tokens- number of words and characters in a string using StringTokenizer class.	6 Marks	L2	CO1	PO2
	b)	Write about Scanner class in Java.	6 Marks	L1	CO1	PO1
		UNIT-III				
5.	a)	Describe Dynamic Method dispatch and the use of final keyword in Java with relevant example.	6 Marks	L2	CO2	PO2
	b)	Develop an Interest Interface which contains Simple Interest and Comp Interest methods and static final field of 25%. Write a class to implement those methods.	6 Marks	L3	CO2	PO3
		(OR)				
6.	a)	Explain method overriding with an example.	6 Marks	L2	CO2	PO2
	b)	Illustrate how an interface can be implemented and extended.	6 Marks	L3	CO2	PO3
		UNIT-IV				
7.	a)	Give and explain any two classes/interfaces of Collection Framework.	6 Marks	L2	CO2	PO1
	b)	Write a Java program that creates three threads. First thread displays - Good Morning for every one second, the second thread displays - Hello for every two seconds and the third thread displays - Welcome for every three seconds.	6 Marks	L3	CO2	PO4
		(OR)				
8.	a)	Explain the process of creating a custom exception.	6 Marks	L2	CO2	PO2
	b)	Write a Java program to change the priority of a thread.	6 Marks	L1	CO2	PO1
		UNIT-V				
9.	a)	Describe the AWT event hierarchy and explain event handling with examples.	6 Marks	L2	CO3	PO1
	b)	Explain about MVC architecture in Swings.	6 Marks	L2	CO3	PO2
		(OR)				
10.		Develop a java program that handles all mouse and key events and shows the event name at the center of the window when mouse event is fired (Use Adapter classes).	12 Marks	L3	CO3	PO5

❀ ❀ ❀

CODE No.: 14BT40402 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations December - 2022

ELECTRONIC CIRCUIT ANALYSIS AND DESIGN

[ELECTRONICS AND COMMUNICATION ENGINEERING, ELECTRONICS AND INSTRUMENTATION ENGINEERING]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) With the help of circuit diagram and equivalent circuit of a Darlington amplifier generate the expression for the overall input impedance of the pair. 7 Marks

b) Develop a generalized expression for overall current gain (AIS) when two transistor stages with $R_{OUT2} < R_L$, $R_{OUT1} > R_{IN2}$, $R_{IN1} > R_S$ and individual voltage gains are A_{V1}, A_{V2}. 7 Marks

(OR)

2 a) Derive expressions for overall voltage gain and overall current gain of a two-stage RC coupled amplifier**.** 8 Marks

b) List out the special features of Darlington pair and cascode amplifiers. 6 Marks

UNIT-II

3 a) Draw neatly the circuit diagram of a common source JFET amplifier and explain its working. 8 Marks

b) The output of CE amplifier is 180^0 out of phase with the input. Explain the reason. 6 Marks

(OR)

4 a) Draw the circuit diagram of a common gate amplifier. Derive the expression for voltage gain and input resistance. 9 Marks

b) What are half power frequencies? Why it is named so? 5 Marks

UNIT-III

5 a) Explain in detail about the different feedback topologies. 8 Marks

b) A transistor Colpitt's oscillator uses a tank circuit with L = 30 mH, C_1 = 200 PF and C_2 = 200 PF. What is the frequency of oscillators? 6 Marks

(OR)

6 a) Draw the circuit diagram of a current series feedback amplifier and derive expressions for voltage gain with and without feedback. 8 Marks

b) A three section RC phase shift oscillator has, R_C = 2KΩ, R = 10KΩ and C=0.01μF. What is the frequency of oscillation? If the oscillator is to be made variable, using the same values of R, what should be the tuning range of capacitors to obtain a frequency range of 10 KHz to 100 KHz. 6 Marks

UNIT-IV

7 a) A single ended class A power amplifier is coupled to an 8Ω load, using a transformer with a turn ratio of 5:1 with a 50V supply the transistor is biased to have a quiescent collector current of 250mA. When a sinusoidal signal is applied to the base, the collector voltage varies between a maximum of 5V and maximum of 90V. Calculate the efficiency, power output & second - harmonic 7 Marks

distortion of this stage.

b) Discuss how amplification takes place in a power amplifier? 7 Marks

(OR)

8 a) State the merits of using push pull configuration? Describe the operation of class B push pull amplifier and show how even harmonics are eliminated. 7 Marks

b) Design a class B power amplifier to obtain the maximum conversion efficiency is 78.5%. 7 Marks

UNIT-V

9 a) Explain the reasons for oscillations in a tuned amplifier. Briefly explain the method used to stabilize the tuned amplifiers against the oscillations? 7 Marks

b) Explain stagger tuned amplifier. 7 Marks

(OR)

10 a) Explain the operation of a Double tuned amplifier, with necessary analysis. 8 Marks

b) Explain various types of neutralization with neat sketches. 6 Marks

CODE No.: 14BT40404 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC14) Supplementary Examinations December - 2022

SIGNALS AND SYSTEMS

[ELECTRONICS AND COMMUNICATION ENGINEERING, ELECTRONICS AND INSTRUMENTATION ENGINEERING]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit

All questions carry equal marks

UNIT-I

1 a) A discrete-time system s described by the following input-output relation $y(n) = n\,x(n)$ is this system. (i) static or dynamic. (ii) linear or non-linear. 7 Marks

b) A discrete-time LTI system is described by the following difference equation relating its input and output $y(n) - a\,y(n-1) = 2\,x(n)$. Find the unit-sample response and step response of the system. 7 Marks

(OR)

2 a) Define the terms: 7 Marks

i) Impulse response function of an LTI system.

ii) Unit sample response sequence of an LSI system.

b) For what range of values of the parameter α are the systems defined by the following difference equations stable? 7 Marks

$$y(n) - 2ay(n-1) + a^2 y(n-2) = x(n)$$

UNIT-II

3 a) Consider full rectified sine have with peak amplitude '1' and time period is '1' expand this function in terms of exponential Fourier series. Also sketch the spectrum. 7 Marks

b) Derive the relation between Trigonometric and exponential Fourier series coefficients. 7 Marks

(OR)

4 a) State and prove Parseval's power theorem. 7 Marks

b) Find the Fourier transform of f (t) = Cos π t; -½≤t≤½ and f (t) = 0; otherwise. 7 Marks

UNIT-III

5 a) Prove that the correlation and convolution functions are identical for even Signals. 7 Marks

b) Explain detection of periodic signals in the presence of noise by Correlation. 7 Marks

(OR)

6 a) State and prove sampling theorem for band limited signals using analytical approach 8 Marks

b) Determine the Nyquist sampling rate and Nyquist sampling interval for the signals (i) sinc(100nt) (ii) sinc(100nt) + sinc(50nt) 6 Marks

UNIT-IV

7 a) A certain function $f(t)$ is known to have a transform $F(s) = \dfrac{s - 5}{(2s^2 + 6s + 5)}$. Find $f(0+)$ and $f(\infty)$. 7 Marks

b) Find the inverse Laplace Transform of $X(s) = \dfrac{-1000}{s^2 - 100}$; ROC: $-10 < \sigma < 10$. 7 Marks

(OR)

8 a) Find the unilateral Laplace Transform of the signal shown in figure. 7 Marks

b) Find the region of convergence of the Laplace transform of the following function. $\dfrac{1}{1+t^2}u(t)$ 7 Marks

UNIT-V

9 a) State and Prove the convolution theorem of Z transform. 7 Marks

b) Find the Z transform of $x(n) = [a^n \cos w_0 n]u(n)$. 7 Marks

(OR)

10 a) Find the impulse response and frequency response of the following discrete time system. $y(n) - y(n-1) + \dfrac{3}{16}y(n-2) = x(n) - \dfrac{1}{2}x(n-1)$ 7 Marks

b) Using partial fraction expansion method, determine $x(n)$, $n \geq 0$ if its unilateral Z transform $X(z)$ is given by $X(z) = \dfrac{8z^2}{1 - 6z + 8z^2}$. 7 Marks

CODE No.: 16BT40101 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, December - 2022

CONCRETE TECHNOLOGY

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		What are the main compounds in Portland cement and explain their properties.	CO1	14 Marks
		(OR)		
2		Mention the different tests to be conducted on aggregate and explain about impact and crushing tests.	CO4	14 Marks

UNIT-II

3		Explain the relation between compression strength and Tensile strength of concrete.	CO2	14 Marks
		(OR)		
4		Explain the Vee-bee method of determining workability with neat sketches.	CO4	14 Marks

UNIT-III

5		Explain the procedure for UPV and Rebound hammer test.	CO5	14 Marks
		(OR)		
6		Draw the typical stress-strain curve of concrete and explain the various modulus of elasticity.	CO2	14 Marks

UNIT-IV

7	a)	Explain what mix design and how mix design will help to improve the quality of concrete.	CO7	7 Marks
	b)	Explain common terminology used in statistical evaluation of concrete.	CO2	7 Marks
		(OR)		
8		Design mix proportions with the following data using IS code method. Characteristic compressive strength of concrete 30 Mpa. 20mm Maximum size of round aggregate. Moderate degree of workability. Specific gravity of cement 3.15 specific gravity of coarse and fine aggregates 2.65. Zone III sand. Good quality control.	CO3	14 Marks

UNIT-V

9		Why Special concretes are required. Give the names of special concretes and explain any two concretes in detail.	CO6	14 Marks
		(OR)		
10		Write short notes on i) Polymer concrete ii) Ready mix concrete iii) Cold weather concreting.	CO1	14 Marks

❀ ❀ ❀

CODE No.: 16BT40102 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

ENGINEERING GEOLOGY
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Demonstrate the relevance of geology in civil engineering.	CO1	14 Marks
		(OR)		
2		Discuss the role of mechanical weathering and chemical weathering.	CO1	14 Marks

UNIT-II

3		Analyze the advantages of study of physical properties in identification of mineral over other properties. Justify the statement with proper reasons.	CO2	14 Marks
		(OR)		
4		List the textures and structures of igneous rocks.	CO2	14 Marks

UNIT-III

5	a)	What is a fold? List various types of folds with neat sketches.	CO2	9 Marks
	b)	A coal bed dips 20^0 along S40^0W and 30^0 along S40^0E. Find out the strike direction and dip direction and inclination of the tunnel to be made for the excavation of coal.	CO1	5 Marks
		(OR)		
6		Classify different geophysical investigations. Explain suitable geophysical methods for the civil engineering projects.	CO3	14 Marks

UNIT-IV

7		Define the cone of depression? Discuss the significance of radius of influence with neat sketch for a sustainable exploitation of groundwater	CO6	14 Marks
		(OR)		
8		Classify the landslides based on the types of materials such as rocks, soils and debris .List different methods to prevent them.	CO4	14 Marks

UNIT-V

9		Analyze the main causative factors of dam failures. Give one case history of dam failure due to geological considerations with a brief geological report	CO7	14 Marks
		(OR)		
10		What are the causes and effects of tunneling on the ground?	CO5	14 Marks

❀ ❀ ❀

CODE No.: 16BT40104 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, December 2022

STRUCTURAL ANALYSIS-I

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	An element has a tensile stress of 600 N/mm^2 and compressive stress of 400 N/mm^2 acting on two mutually perpendicular planes and two equal shear stress of 100 N/mm^2. Determine the principal stress and maximum shear stress.	CO2	7 Marks
	b)	An element has a tensile stress of 500 N/mm^2 and compressive stress of 300 N/mm^2 acting on two mutually perpendicular planes and two equal shear stress of 200 N/mm^2. Determine the principal stress and maximum shear stress using Mohr's Circle method.	CO2	7 Marks
		(OR)		
2	a)	Derive the expression for stresses in an inclined plane due to pure shearing.	CO1	7 Marks
	b)	At a point in a bracket the stresses on two mutually perpendicular planes are 40 N/mm^2 and 10 N/mm^2 both being tensile. The shear stress across these planes is 8 N/mm^2. Using graphical method, find the magnitude and direction of the resultant stress on a plane making an angle 40° with the plane of maximum stress. Also determine the normal and tangential stresses on the plane.	CO2	7 Marks

UNIT-II

3	a)	Derive the expression for slope and deflection of a simply supported beam of span 'l' carrying a point load at mid-span.	CO1	7 Marks
	b)	Find slope and deflection at the free end of a cantilever beam shown in fig. Moment of inertia of AC is twice the moment of inertia of BC. Use moment area method.	CO2	7 Marks
		(OR)		
4	a)	A simply supported beam of span 'l' carries a point load 'W' at a distance 'a' from the left end. Determine the deflection under the load and slope at the left end using appropriate method.	CO4	7 Marks
	b)	Determine the slope and deflection at the free end of a cantilever beam of length 'l' subjected to a uniformly varying load of 'w/m' at the fixed end and 'zero' at the free end.	CO4	7 Marks

UNIT-III

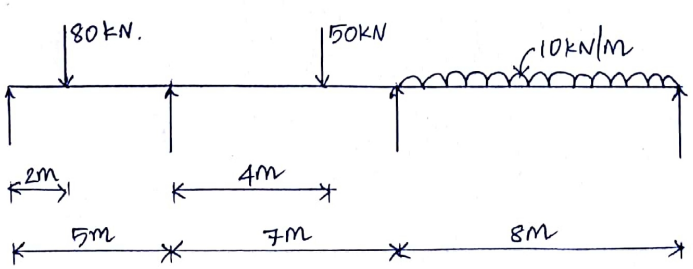
5		Define slenderness ratio. Derive the Euler's formula when both ends of the column are fixed.	CO1	14 Marks
		(OR)		
6		From the following data, determine thickness of cast-iron column: Length of column = 6 meters External diameter = 200 mm Load = 500 kN Factor of safety = 6 Assume fixed ends and ultimate compressive stress and constant for hinged ends as 570 MN/m^2 and 1/1600 respectively.	CO5	14 Marks

UNIT-IV

7	A fixed beam of 5 m span carries a point load of 150 kN at 3 m from the left end. If the right end sinks by 10.5 mm, find the fixing moments as well as reactions at the supports. Take E = 2×10^8 kN/m^2 and I = 10000 cm^4.	CO2	14 Marks

(OR)

8	For the continuous loaded beam ABCD shown in the figure, find: i) Moments at the supports ii) Reactions at the supports Draw the B.M. and S.F. diagrams also.	CO6	14 Marks



UNIT-V

9	In a steel member at a point the major principal stress is 180 MN/m^2 and the minor principal stress is compressive. If the tensile yield point of the steel is 225 MN/m^2, find the value of the major principal stress at which yielding will commence, according to each of the following criteria of failure i) Maximum Shearing Stress ii) Maximum Total Strain Energy iii) Maximum Shear Strain Energy Take Poisson's ratio=0.26.	CO3	14 Marks

(OR)

10	Derive the expression for shear center of unequal I section.	CO1	14 Marks

❀ ❀ ❀

CODE No.: 16BT40301 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, December - 2022

DESIGN OF MACHINE ELEMENTS - I

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What are the steps to be followed while designing a machine element?	CO1	7 Marks
	b)	Define the following properties of a material: i) Ductility ii) Toughness iii) Hardness and iv) Creep.	CO1	7 Marks
		(OR)		
2	a)	Analyze the significance of Factor Safety in Design	CO1	4 Marks
	b)	Determine the maximum thickness of the steel sheet into which holes of 20mm size can be punched. The ultimate tensile strength of the sheet material is 250 MPa. The allowable compressive stress during the punching operation in the hardened end of the punch is limited to 400 MPa.	CO2	10 Marks

UNIT-II

3	a)	What is meant by endurance strength of a material? How do the size and Surface condition of a component and type of load and effect such strength?	CO1	4 Marks
	b)	A circular bar of 500mm length is supported freely at its two ends. It is acted upon by a central concentrated cyclic load having a minimum value of 20kN and maximum value of 50kN. Determine the dia. of bar by taking a factor of safety of 1.5, size effect of 0.85, surface finish factor of 0.9. The material properties of bar are given by ultimate strength of 650 MPa, yield strength of 500 MPa and endurance strength of 350 MPa.	CO4	10 Marks
		(OR)		
4	a)	Formulate Soderberg's equation and state its application to different types of loading.	CO2	6 Marks
	b)	A 50mm diameter shaft is made from carbon steel having ultimate tensile strength of 630 MPa. It is subjected to a torque which fluctuates between 2000 N-m to 800 N-m. Using Soderberg method, calculate the factor of safety. Assume suitable values for any other data needed.	CO3	8 Marks

UNIT-III

5		A steam engine of effective diameter 300 mm is subjected to a stem pressure of 1.5 N/mm2. The cylinder head is connected by 8 bolts having yield point 330 MPa and endurance limit at 240 MPa. The bolts are tightened with an initial preload of 1.5 times the steam load. A soft copper gasket is used to make the joint leak-proof. Assuming a factor of safety 2, find the size of bolt required. The stiffness factor for copper gasket may be taken as 0.5.	CO5	14 Marks
		(OR)		
6		A plate 130 mm wide and 15 mm thick is to be welded to another plate by means of double parallel fillets. The plates are subjected to a static load of 90 KN. Find the length of weld if the permissible shear stress in the does not exceed 57 MPa.	CO4	14 Marks

UNIT-IV

7	A shaft supported at the ends in ball bearings carries a straight tooth spur gear at its mid span and is to transmit 7.5 kW at 300 r.p.m. The pitch circle diameter of the gear is 150 mm. The distances between the centre line of bearings and gear are 100 mm each. If the shaft is made of steel and the allowable shear stress is 45 MPa determine the diameter of the shaft. Show in a sketch how the gear will be mounted on the shaft; also indicate the ends where the bearings will be mounted?. The pressure angle of the gear may be taken as 20^0.	CO3	14 Marks

(OR)

8	Design a cast iron protective type flange coupling to transmit 15kW at 900 rpm. From an electric motor to a compressor. The service factor may be as 1.35. The following permissible stresses may be used: Shear stress for shaft, bolt and key material = 40 MPa Crushing stress for bolt and key = 80 MPa Shear stress for cast iron = 8 MPa Draw a neat sketch of the coupling.	CO3	14 Marks

UNIT-V

9	Design a cutter joint to connect two mild steel rods for a pull of 30 kN. The maximum permissible stresses are 55 MPa in tension: 40 MPa in shear and 70 MPa in crushing. Draw a neat sketch of the joint designed.	CO4	14 Marks

(OR)

10	Design a knuckle joint for a tie rod of a circular section to sustain a maximum pull of 70kN. The ultimate strength of the material of the rod against tearing is 420 MPa. The ultimate tensile and shearing strength of the pin material are 510 MPa and 396 MPa respectively. Determine the tie rod section and pin section. Take factor of safety = 6.	CO6	14 Marks

❀ ❀ ❀

CODE No.: 16BT40302 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

DYNAMICS OF MACHINERY
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	A dry single plate clutch is to be designed for an automotive vehicle whose engine is rated to give 100 kW at 2400 r.p.m. and maximum torque 500 N-m. The outer radius of friction plate is 25% more than the inner radius. The intensity of pressure between the plate is not to exceed 0.07 N/mm^2. The coefficient of friction may be assumed equal to 0.3. The helical springs required by this clutch to provide axial force necessary to engage the clutch are eight. If each spring has stiffness equal to 40 N /mm, determine the initial compression in the springs and dimensions of the friction plate	CO2	14 Marks
	(OR)		
2	Describe with the help of a neat sketch the principles of operation of an internal expanding shoe. Derive the expression for the braking torque.	CO1	14 Marks

UNIT-II

3	A ship propelled by a turbine rotor which has a mass of 5 tonnes and a speed of 2100 r.p.m. The rotor has a radius of gyration of 0.5 m and rotates in a clockwise direction when viewed from the stern. Find the gyroscopic effects in the following conditions: i) The ship sails at a speed of 30 km/h and steers to the left in a curve having 60 m radius. ii) The ship pitches 6 degree above and 6 degree below the horizontal position. The bow is descending with its maximum velocity. The motion due to pitching is simple harmonic and the periodic time is 20 seconds. The ship rolls and at a certain instant it has an angular velocity of 0.03 rad/s clockwise when viewed from stern. Determine also the maximum angular acceleration during pitching. Explain how the direction of motion due to gyroscopic effect is determined in each case.	CO2	14 Marks
	(OR)		
4	The turning moment curve for an engine is represented by the equation, $T = (20\,000 + 9500 \sin 2\theta - 5700 \cos 2\theta)$ N-m, where θ is the angle moved by the crank from inner dead centre. If the resisting torque is constant, find: i) Power developed by the engine ; ii) Moment of inertia of flywheel in kg-m^2, if the total fluctuation of speed is not exceed 1% of mean speed which is 180 r.p.m; and Angular acceleration of the flywheel when the crank has turned through 45° from inner dead centre.	CO3	14 Marks

UNIT-III

5		Explain the terms and derive expressions for 'effort' and 'power' of a Porter governor	CO1	14 Marks

(OR)

6		In a spring-controlled governor of the Hartung type, the length of the ball and sleeve arms are 80 mm and 120 mm respectively. The total travel of the sleeve is 25 mm. In the mid position, each spring is compressed by 50 mm and the radius of rotation of the mass centres is 140 mm. Each ball has a mass of 4 kg and the spring has a stiffness of 10 kN/m of compression. The equivalent mass of the governor gear at the sleeve is 16 kg. Neglecting the moment due to the revolving masses when the arms are inclined, determine the ratio of the range of speed to the mean speed of the governor. Find, also, the speed in the mid-position	CO2	14 Marks

UNIT-IV

7	a)	Write the importance of balancing.	CO1	4 Marks
	b)	A shaft carries four masses in parallel planes A, B, C and D in this order along its length. The masses at B and C are 18 kg and 12.5 kg respectively, and each has an eccentricity of 60 mm. The masses at A and D have an eccentricity of 80 mm. The angle between the masses at B and C is 100° and that between the masses at B and A is 190°, both being measured in the same direction. The axial distance between the planes A and B is 100 mm and that between B and C is 200 mm. If the shaft is in complete dynamic balance, determine : i) The magnitude of the masses at A and D ; ii) The distance between planes A and D ; and iii) The angular position of the mass at D.	CO4	10 Marks

(OR)

8	a)	Explain the terms Variation of Tractive Force, Swaying Couple, Hammer Blow.	CO1	4 Marks
	b)	The following data refer to two cylinder locomotive with cranks at 90°: Reciprocating mass per cylinder = 300 kg; Crank radius = 0.3 m; Driving wheel diameter = 1.8 m; Distance between cylinder centre lines = 0.65 m; Distance between the driving wheel central planes = 1.55 m. Determine : i) The fraction of the reciprocating masses to be balanced, if the hammer blow is not to exceed 46 kN at 96.5 kmph. ii) The variation in tractive effort ; and iii) The maximum swaying couple.	CO4	10 Marks

UNIT-V

9	a)	What are the causes and effects of vibrations?	CO1	4 Marks
	b)	Establish an expression for the natural frequency of free transverse vibrations for a simply supported beam carrying a number of point loads, by Dunkerley's method.	CO5	10 Marks

(OR)

10	a)	Explain about the Magnification Factor in forced vibration.	CO1	4 Marks
	b)	With neat sketch explain the Free Torsional Vibrations of a Three Rotor System, and deduce the equation for Torsionally Equivalent Shaft.	CO1	10 Marks

❀ ❀ ❀

CODE No.: 16BT40303 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations December-2022

FLUID MECHANICS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define viscosity and write down the units. And write down different types of fluids.	CO1	7 Marks
	b)	A plate 0.025 mm distance from a fixed plate, moves at 60 cm/sec and requires a force of 2 N per unit area i.e., 2 N/m^2 to maintain this speed. Determine the fluid viscosity between the plates.	CO2	7 Marks
		(OR)		
2		At the right limb of a simple differential manometer containing the mercury is open to the atmosphere while the left limb is connected to a pipe in which a fluid of specific gravity 0.9 is flowing. The centre of the pipe is 12cm below the level of mercury in the right limb. Find the pressure of fluid in the pipe if the difference of mercury level in the two limbs is 20 cm.	CO2	14 Marks

UNIT-II

3		A 30 cm diameter pipe, conveying water, branches into two pipes of diameters 20cm and 15cm respectively .if the average velocity in the pipe 30cm diameter is 2.5 m/sec, find the discharge in these pipe. Also determine the velocity in 15 cm pipe if the average velocity in 20 cm diameter pipe is 2m/sec.	CO4	14 Marks
		(OR)		
4		What is venturimeter? Derive an expression for the discharge through venturimeter.	CO1	14 Marks

UNIT-III

5	a)	Outline the minor energy losses in pipes.	CO1	7 Marks
	b)	The difference in water surface levels in two tanks, which are connected by three pipes in series of lengths 300 m, 170 m and 210 m and of diameters 300 mm, 200 mm and 400 mm respectively, is 12 m. determine the rate of flow of water if co-efficient of friction are 0.005, 0.0052 and 0.0048 respectively, considering: i) Minor losses also ii) Neglecting minor losses	CO5	7 Marks
		(OR)		
6		Derive an expression for the force exerted by a jet of water on stationary flat vertical and inclined plates.	CO3	14 Marks

UNIT-IV

7	a)	Explain factors to be consider for selection of a turbine at a particular place.	CO1	7 Marks
	b)	Differentiate between impulse and reaction turbine.	CO1	7 Marks
		(OR)		
8		Define the specific speed of a turbine? Derive an expression for the specific speed. What is the significance of the specific speed?	CO1	14 Marks

UNIT-V

9	a)	Describe manometric efficiency, mechanical efficiency and overall efficiency of centrifugal pump.	CO1	7 Marks
	b)	Find reasons for negative slip in a reciprocating pump? Explain with neat sketches the functions of air vessels in a reciprocating pump	CO1	7 Marks

(OR)

10		A double acting reciprocating pump, running at 50 r.p.m. is discharging 900 litres of water per minute. The pump has stroke of 400 mm. The diameter of piston is 250 mm. The delivery and suction head are 25 m and 4 m respectively. Find the slip of the pump and power required to drive the pump.	CO6	14 Marks

CODE No.: 16BT40304 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, December 2022

MACHINE TOOLS AND MODERN MACHINING PROCESSES

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	List the various types of chips formed during machining. Under what conditions those chips will be formed.	CO6	7 Marks
	b)	A carbide tool with mild steel work piece was found to give a life of 2 hours while cutting at 0.5 mpm. Compute the tool life if the same tool is used at a speed of 25% higher than the previous one. Also determine the value of cutting speed if the tool is required to have tool life of 3 hours. Assume Taylor's exponent n=0.27.	CO4	7 Marks
		(OR)		
2	a)	Define cutting speed, feed, depth of cut and explain the principle angles of ORS.	CO6	7 Marks
	b)	Analyze the reasons for tool failure. Explain in detail.	CO2	7 Marks
		UNIT-II		
3	a)	Classify different types of lathes. Explain any one in detail.	CO2	7 Marks
	b)	Explain the taper turning attachment with a neat sketch.	CO1	7 Marks
		(OR)		
4	a)	Differentiate between turret and Capstan lathes.	CO1	7 Marks
	b)	Explain about Multi spindle automatic lathes.	CO1	7 Marks
		UNIT-III		
5	a)	Explain with a neat sketch the working of quick return mechanism used in a shaping machine	CO1	7 Marks
	b)	Differentiate between shaper and planer.	CO2	7 Marks
		(OR)		
6	a)	Explain the construction of a Radial drilling machine with a neat sketch.	CO1	7 Marks
	b)	Discuss Jig boring machine.	CO1	7 Marks
		UNIT-IV		
7	a)	Mention the various types of bonds used in the making of grinding wheel. Discuss them in brief.	CO2	7 Marks
	b)	Write a short note on loading and glazing of a grinding wheel.	CO3	7 Marks
		(OR)		
8	a)	Define indexing. Describe direct indexing with an example.	CO4	7 Marks
	b)	Illustrate the design principle of Jigs and fixtures.	CO3	7 Marks
		UNIT-V		
9	a)	Classify the modern machining processes and their applications.	CO5	7 Marks
	b)	List the advantages of modern machining processes.	CO5	7 Marks
		(OR)		
10	a)	Explain about the Electro~discharge machining.	CO5	7 Marks
	b)	List the advantages, limitations and applications of EDM.	CO2	7 Marks

❀ ❀ ❀

CODE No.:16BT40305 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

THERMAL ENGINEERING - I

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain working of four stroke diesel engine with the help of neat sketches.	CO1	7 Marks
	b)	Draw port timing diagram for two stroke petrol engine.	CO1	7 Marks
		(OR)		
2	a)	What is the difference between air-standard cycle and fuel-air cycle analysis? Explain the significance of the fuel-air cycle.	CO1	7 Marks
	b)	Explain with the help of a p-V diagram the loss due to variation of specific heats in an Otto cycle.	CO1	7 Marks

UNIT-II

3	a)	Explain various stages of combustion in CI engine on P-θ diagram.	CO2	7 Marks
	b)	Explain the factors that affect normal combustion.	CO2	7 Marks
		(OR)		
4	a)	Explain the factors affecting flame propagation.	CO1	6 Marks
	b)	What is meant by abnormal combustion? Explain the phenomena of detonation in CI engines.	CO4	8 Marks

UNIT-III

5	a)	What is a dynamometer? List out the different types of dynamometer.	CO1	4 Marks
	b)	A two stroke diesel engine was motored when the meter reading was 1.5 kW, Then the test on the engine was carried out for one hour and the following observations were recorded: Brake torque = 120 Nm, Speed=600 rpm, Fuel used 2.5 kg, Calorific value of fuel = 40.3 MJ/kg, Cooling water used = 818 kg, Rise in temperature of cooling water = 10 ^{0}C, Exhaust gas temperature = 345 ^{0}C, Room temperature = 25 ^{0}C, A/F=32:1. Determine i) BP, ii) IP, iii) Mechanical efficiency, iv) Draw heat balance sheet on minute basis and also in percentage.	CO3	10 Marks
		(OR)		
6	a)	Describe how an Indicated power of each cylinder of a multi-cylinder engine is measured?	CO1	7 Marks
	b)	Explain the procedure for preparing heat balance sheet.	CO3	7 Marks

UNIT-IV

7	a)	Define ultimate analysis and proximate analysis of coal. Explain how sampling of coal is done in a boiler trial.	CO1	4 Marks
	b)	The volumetric composition of a coal gas is given as H_2 = 25%, CO = 7%, CH_4 = 48%, C_2H_4 = 11%, CO_2 = 4% and N_2 = 3%. If 50% excess air is supplied, find the percentage composition by volume of the products assuming H_2O produced is perfect gas.	CO5	10 Marks
		(OR)		
8	a)	What is the significance of Adiabatic flame temperature?	CO1	4 Marks
	b)	Describe the working of the apparatus that is commonly used for the analysis of dry exhaust gases. Discuss about the probable sources of error in such an analysis.	CO1	10 Marks

UNIT-V

9	a)	What are the advantages of multi-stage compression over a single stage compression for the same pressure ratio? Why intercooling is necessary in multi-stage compression?	CO2	7 Marks
	b)	Compare rotary and reciprocating compressors.	CO1	7 Marks
		(OR)		
10	a)	Define volumetric efficiency of a compressor and explain why it is less than unity.	CO1	4 Marks
	b)	A single-stage double-acting air compressor delivers 15 m^3/min of air measured at 1.013 bar and temperature 27 ^{0}C and delivers at 7 bar. The conditions at the end of the suction stroke are pressure 0.98 bar and temperature 40 ^{0}C. The clearance volume is 4% of the swept volume and the stroke/bore ratio is 1.3/1, compressor runs at 300 rpm. Calculate the volumetric efficiency, cylinder dimensions, indicated power and isothermal efficiency of this compressor. Take the index of compression and expansion as 1.3.	CO2	10 Marks

CODE No.: 16BT40401 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, December - 2022

ANALOG COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

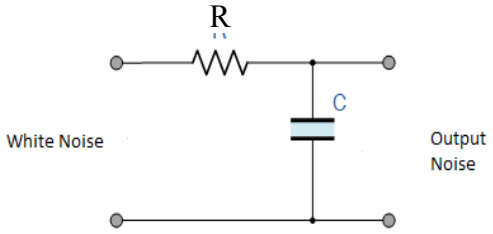
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the operation of coherent detection of DSB-SC modulating wave and show that the overall output $V_0(t) = 1/2\ A_c Cos Øm(t)$.	CO5	6 Marks
	b)	Briefly explain the Quadrature Null Effect in DSB-SC coherent detection. Suggest an appropriate method to offset this problem.	CO1	8 Marks

(OR)

2	a)	With a neat diagram, explain how SSB wave is generated using phase discriminator method with only USB and rejecting the LSB.	CO1	10 Marks
	b)	Derive and show that the noise equivalent band width for RC low pass filter is 1/4RC.	CO5	4 Marks



UNIT-II

3	a)	With the help of circuit diagram, explain demodulation of FM wave using balanced frequency discriminator.	CO1	8 Marks
	b)	Determine the modulation index and bandwidth for FM and PM signals for a modulating signal 5 cos 30000 π t angle modulates a carrier A cos2π fct. Assume $K_f=K_p$ =15KHz/volt.	CO3	6 Marks

(OR)

4	a)	Explain with relevant mathematical expressions for the demodulation of an FM signal using PLL.	CO1	8 Marks
	b)	An FM signal is given by s(t) = 2cos20000πt+cos2000πt+3cos40000πt. Determine the bandwidth and β assuming K_f=104Hz/Volts.	CO3	6 Marks

UNIT-III

5	a)	Derive the expression for SNR in a PM system for tone modulation.	CO2	8 Marks
	b)	A phase modulation (PM) system, with the modulated wave defined by S (t) =AcCos [2πfct + kpm(t)] where kp is a constant and m(t) is the message signal. The additive noise n(t) at the phase detector input is $n(t)= n_I(t)\cos(2\pi fc\ t)-n_Q(t)\ \sin\ 2\pi fct$ Assuming that the carrier-to-noise ratio at the detector input is high compared with unity, determine. i) The output signal-to-noise ratio. ii) The figure of merit of the system.	CO4	6 Marks

(OR)

6	a)	Derive the expression of SNR and figure of merit for SSB-SC.	CO2	8 Marks
	b)	If each stage has a gain of 10dB and noise figure of 10dB. Determine the overall noise figure of a two stage cascaded amplifier.	CO4	6 Marks

UNIT-IV

7	a)	What do you mean by automatic gain control (AGC)? What are merits of delayed AGC over simple AGC?	CO2	7 Marks
	b)	The antenna current of transmitter is 11.5 Amp when it is modulated to a depth 45% by audio sine wave. Determine unmodulated (carrier) current.	CO6	7 Marks

(OR)

8	a)	What is image frequency rejection ratio and what is its importance?	CO1	7 Marks
	b)	In a broadcast super heterodyne receiver tuning at 1200 kHz having no RF amplifier, the loaded Q of the antenna coupling circuit is 100, By Considering standard IF frequency determine the Image frequency and its rejection ratio.	CO6	7 Marks

UNIT-V

9	a)	Write short notes on the following: i) Single polarity PAM; ii) Double polarity PAM.	CO1	6 Marks
	b)	With a neat block diagram, explain the working of TDM technique.	CO1	8 Marks

(OR)

10	a)	Explain the concept of multiplexing in communication.	CO1	6 Marks
	b)	Differentiate between FDM and TDM. Explain which of the two is superior and why.	CO2	8 Marks

CODE No.: 16BT40403 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

ELECTROMAGNETIC THEORY AND TRANSMISION LINES
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Obtain the expressions for the far field and the potential due to a small electric dipole oriented along z-axis. Find the potential at (0,1,3) due to the small electric dipole placed at (0,0,0).	CO4	7 Marks
	b)	State Biot-savart's Law. Formulate an expression for Straight Filamentary Conductor of finite length.	CO1	7 Marks

(OR)

2	a)	Calculate induced electric field intensity for $r < 2$ and $r > 2$, if the magnetic flux density B=20 *sin* wt, *for* $r < 2$ and $B = 0$ *for* $r>2$.	CO4	7 Marks
	b)	Write the word statements for Maxwell's two equations for magnetostatic fields and explain their significance.	CO1	7 Marks

UNIT-II

3	a)	Explain the concept of Transformer and Motional EMFs. Formulate the related expressions.	CO1	8 Marks
	b)	Derive the electrostatic Boundary Conditions for i) Dielectric – Dielectric Boundary ii) Conductor – Dielectric Boundary iii) Conductor – Free Space Boundary	CO5	6 Marks

(OR)

4	a)	Outline the Final statements of Maxwell's Equations for Time Varying Fields. Represent the Final forms of Maxwell's Equations in Point and Integral forms.	CO1	7 Marks
	b)	Show that the Continuity equation for time varying fields is different from that of static fields.	CO6	7 Marks

UNIT-III

5	a)	Illustrate the reflection by a perfect conductor at oblique incidence for parallel polarization. Formulate the expressions for fields, reflection and transmission coefficients.	CO2	7 Marks
	b)	Define a uniform Plane wave and obtain the general solution of the uniform plane wave.	CO5	7 Marks

(OR)

6	a)	Derive the expressions for attenuation constant (α), phase constant (β), phase velocity (v_p) and intrinsic impedance (η).	CO2	7 Marks
	b)	Find all relations between E and H in a uniform Plane wave. Also Estimate the Value of intrinsic impedance of free space.	CO5	7 Marks

UNIT-IV

7	a)	Derive the characteristic impedance in terms of line constants.	CO2	8 Marks
	b)	A lossless transmission line of length 100m has an inductance of 28 μ H and capacitance of 20 nF. Find out i) Propagation velocity ii) Phase constant at an operating frequency of 100 KHz iii) Characteristic impedance of the line.	CO6	6 Marks

(OR)

8	a)	Derive the expressions for phase velocity and group velocity and relate them.	CO2	6 Marks
	b)	List and explain the various parameters that are assessed from transmission line equations.	CO1	8 Marks

UNIT-V

9	a)	Develop a step wise procedure to design single stub matching using smith chart.	CO6	7 Marks
	b)	Design a single stub match for a load of 150+j225 ohms for a 75 ohms line at 500 MHz using smith chart.	CO3	7 Marks

(OR)

10	a)	List the applications of smith chart. Also suggest a procedure to match a single stub to transmission line using smith chart.	CO6	7 Marks
	b)	Design a single stub (Short circuited shunt stub) matching network for a transmission line terminated with ZR=200-J400 ohms to obtain matching for maximum length of the transmission line. The characteristic impedance of the line is Zo=50 ohms.	CO4	7 Marks

CODE No.: 16BT40404 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations December-2022

LINEAR IC APPLICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	List and explain the function of all the basic building blocks of an op-amp.	CO1	7 Marks
	b)	Define common mode rejection ratio. Explain its significance.	CO1	7 Marks
		(OR)		
2	a)	Explain the terms i) slew rates; ii) CMRR; iii) PSRR; iv) Drift.	CO1	8 Marks
	b)	Explain clearly about the stability of op-amp, with the help of open loop gain vs frequency curve.	CO1	6 Marks

UNIT-II

3	a)	Draw and explain the circuit of V/I converter if the load is i) Floating; ii) Grounded.	CO3	7 Marks
	b)	Explain clearly the requirements of a practical differentiator with the help of its frequency response.	CO3	7 Marks
		(OR)		
4	a)	What is a precision diode? Draw and briefly explain the operation of a circuit that detects the peak value of any given signal.	CO4	7 Marks
	b)	Explain the operation of an Astable multivibrator using op-amp and also derive for its frequency of output.	CO3	7 Marks

UNIT-III

5	a)	Explain the necessity and operation of all the parts of a series op-amp regulator.	CO1	6 Marks
	b)	Derive the transfer function for a general second order active filter using op-amp. Show its frequency response for different damping constants.	CO2	8 Marks
		(OR)		
6	a)	Design a band pass filter so that f_o=2KHz, Q=20 and A_o=10 with C=1μF.	CO3	7 Marks
	b)	Explain how current limiting and current fold back characteristics are obtained in IC 723 regulator.	CO3	7 Marks

UNIT-IV

7	a)	Explain how a 555 timer in its Astable mode can be connected as a pulse position modulator?	CO1	7 Marks
	b)	Draw the circuit of PLL AM detector and explain its operation.	CO1	7 Marks
		(OR)		
8	a)	What is capture range? Derive the expression for lock range in a PLL.	CO1	7 Marks
	b)	Draw the circuit of a Schmitt trigger using 555 timer and explain its operation.	CO1	7 Marks

UNIT-V

9	a)	Explain about the successive approximate conversion in an ADC. Why it is advantages over the other methods of ADCs.	CO1	8 Marks
	b)	Explain about: i) Resolution; ii) Linearity; iii) Monotonicity.	CO1	6 Marks
		(OR)		
10	a)	Which type of ADC is fastest? Explain clearly why?	CO1	7 Marks
	b)	Explain clearly the D/A conversion in a 3-bit R-2R ladder circuit.	CO1	7 Marks

❀ ❀ ❀

CODE No.: 16BT40405 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, December 2022

PROBABILITY AND STOCHASTIC PROCESS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

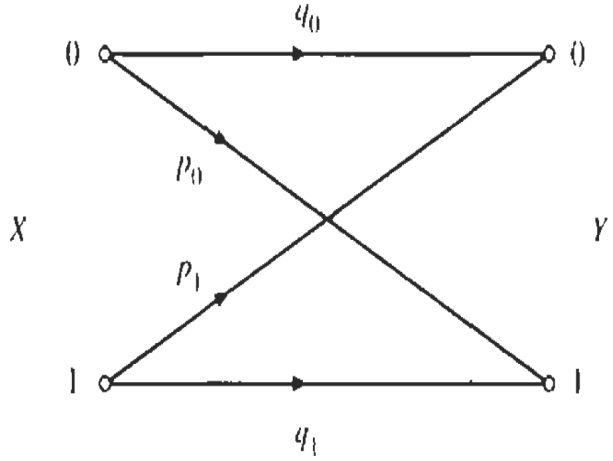
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Discuss about Bernoulli's Trails. Obtain the expression for Binomial Probability.	CO1	6 Marks
	b)	In the experiment of throwing two fair dice, let *A* be the event that the first die is odd, B be the Event that the second die is odd, and C be the event that the sum is odd. Show that events *A,* B, and C are pair wise independent, but *A, B,* and C are not independent.	CO1	8 Marks

(OR)

2		Consider the binary communication channel shown in Fig. The channel input symbol X may assume the state 0or the state 1, and, similarly, the channel output symbol Y may assume either the state 0or the state 1. Because of the channel noise, an input 0may convert to an output 1 and vice versa: i) Find Output Probabilities at 0 and 1 ii) If a 0 was observed at the output, what is the probability that a 0 was the Input state? iii) If a 1 was observed at the output, what is the probability that a 1 was the input state? iv) Calculate the probability of error.	CO4	14 Marks



UNIT-II

3	a)	State and prove the properties of the probability density function.	CO2	6 Marks
	b)	A random variable X has the following probability distribution.	CO3	8 Marks

x:	0	1	2	3	4	5	6	7
p(x):	0	K	2K	2K	3K	K2	2K2	7K2+K

Calculate

i) The value of k ii) $P(X>4.5)$ iii) $P(X\leq 4.5)$
iv) $P(X=4.5)$ v) $P(1.5<X<4.5/X>2)$

(OR)

4	a)	State and prove properties of characteristic function of a random variable *X*.	CO2	7 Marks
	b)	Find the moment generating function of binomial distribution. Obtain the expression for variance and mean.	CO3	7 Marks

UNIT-III

5	a)	State Central Limit theorem.	CO1	6 Marks
	b)	Consider an experiment of drawing randomly three balls from an urn containing two red, three white, and four blue balls. Let (X, Y) be a bivariate random variable where X and Y denote, respectively, the number of red and white balls chosen. i) Find the range of (X, Y). ii) Find the joint pmf's of (X, Y). iii) Find the marginal pmf's of X and Y.	CO3	8 Marks

(OR)

6	a)	Discuss about Joint Density Function and mention its properties.	CO1	6 Marks
	b)	The joint pdf of a bivariate r.v. (X, Y) is given by; $F_{XY}(x,y) = \begin{cases} k(x+y) & 0<x<2 \quad 0<y<2 \\ 0 & Otherwise \end{cases}$ Where k is a constant. i) Find the value of k. ii) Find the marginal pdf's of X and Y. iii) Are X and Y independent? iv) Find P(X+Y≤1)	CO3	8 Marks

UNIT-IV

7	a)	Define a K^{th}-order stationary random process. When it will become a SSS Process.	CO1	7 Marks
	b)	A random process is defined by Y(t)= X(t) cos($\omega_o t+\theta$) where X(t) is WSS random process that amplitude modulates a carrier of constant angular frequency ω_o with a random phase θ independent of X(t) and uniformly distributed on(-∏,∏). Is Y(t) a WSS random process.	CO4	7 Marks

(OR)

8	a)	State and prove the properties of autocorrelation function.	CO1	7 Marks
	b)	Model a random telegraph signal process $Y(t) = \lambda X(t)$ is a Wide Sense Stationary Process Where λ is a random variable which is $X(t)$ independent of and assumes values -1 and +1 with equal probability and $R_{x_1,x_2}(t_1,t_2) = e^{-2\lambda\|t_1-t_2\|}$.	CO4	7 Marks

UNIT-V

9	a)	What type of noise associated with respect to presence of signal and explain it briefly.	CO3	7 Marks
	b)	For a nonlinear amplifier with two input frequencies 3KHz, and 8KHz, determine: i) First 3 harmonics present in the output for each input frequency. ii) Cross-Product frequencies produced for values of m and n of 1 and 2 respectively.	CO3	7 Marks

(OR)

10	a)	For a non-ideal amplifier having following parameters, Input Signal Power=2×10^{-10}W, Input Noise Power=2×10^{-18} W, Power gain=60dB, Internal Noise =6×10^{-12} W Determine: i) Input S/N Ratio(dB) ii) Output S/N Ratio(dB) iii) Noise Factor iv) Noise Figure	CO3	7 Marks
	b)	Determine : i) 2^{nd}, 3^{rd} and 12^{th} harmonics for a 1KHz periodic wave. ii) Percent 2^{nd} order , 3^{rd} order and total harmonic distortion for a fundamental frequency with an amplitude of 8 V_{rms}, a 2^{nd} harmonic amplitude of 0.2Vrms and 3^{rd} harmonic amplitude of 0.1 V_{rms}	CO3	7 Marks

❁ ❁ ❁

CODE No.:16BT40406 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech II Semester (SVEC16) Supplementary Examinations December - 2022

PULSE AND DIGITAL CIRCUITS

[ELECTRONICS AND COMMUNICATION ENGINEERING]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

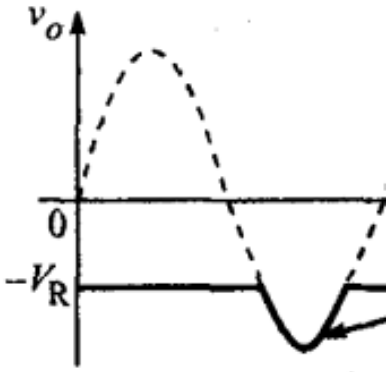
1.	a)	Prove that an RC circuit behaves as a good integrator if RC>>15T. Where T is the period of an input '$E_m \sin\omega t$'.	CO2	6 Marks
	b)	A symmetrical square wave peak-to-peak amplitude 10V and frequency 10KHz is applied to a High pass RC circuit. Sketch the input and output waveforms to scale and derive the necessary output voltage expressions.	CO4	8 Marks

(OR)

2.	a)	Explain application of attenuator as a CRO Probe.	CO1	7 Marks
	b)	Analyze the response of low pass RC circuit for a square input for different time constants.	CO2	7 Marks

UNIT-II

3.	a)	Explain in detail about practical clamping circuit with aid of neat sketches.	CO1	7 Marks
	b)	Design a series clipper circuit that produces a following waveform. Assuming that input applied voltage is 50V (P-P), V_R=-10V and assume Diode is Ideal.	CO3	7 Marks



(OR)

4.	a)	In a clamping circuit, for symmetrical square wave Asses the parameters of ratio of area in forward direction to area in reverse direction in terms of forward resistance $R_f$to reverse resistance R_r .	CO6	8 Marks
	b)	Explain the operation of a biased negative clamper with neat sketch.	CO1	6 Marks

UNIT-III

5.	a)	Explain the working of a fixed-bias binary with the help of neat circuit diagrams.	CO1	6 Marks
	b)	Design a collector coupled one-shot multivibrator using n-p-n silicon transistors, Neglect I_{CBO} and the junction voltages. Assume $h_{FE(min)}$ = 20, V_{BE} = -1V for the transistor in cut-off and $I_B = 1.5I_{B(min)}$ for the transistor in saturation. Vcc = 12V, I_C(sat) = 2mA, T = 2msec, and $R_1 = R_2$. Find R_C, R, V_{BB}, R_1 and C.	CO3	8 Marks

(OR)

6.	a)	Design a collector-coupled monostable multivibrator with a gate width of 5ms using n-p-n silicon transistors.	CO3	8 Marks
	b)	With the help of neat diagrams discuss the different methods of triggering a binary.	CO1	6 Marks

UNIT-IV

7.	a)	Explain the basic principles of Miller and bootstrap time - base generators.	CO1	7 Marks
	b)	Write important applications of time-base circuits. With reference to time base circuits define the following terms: i) Fly back time; ii) Transmission error.	CO2	7 Marks

(OR)

8.	a)	Design a transistor bootstrap ramp generator to provide an output amplitude of 12V over a time period of 2 ms. The input signal is negative going pulse with an amplitude of 5V, a pulse width of 2 ms and the time interval between pulses is 0.5 ms. The load resistance is 2 kΩ and the ramp is to be linear within 1%. The supply is 15V.Take $h_{FE(min)}$= 80. Assume the necessary data.	CO3	6 Marks
	b)	Apply an appropriate sweep circuit to obtain the gain value 1.	CO5	8 Marks

UNIT-V

9.	a)	Draw and explain the operation of 4 diode sampling gate.	CO1	7 Marks
	b)	Draw and explain the operation of TTL NAND gate circuit and explain the importance of Totempole output.	CO6	7 Marks

(OR)

10.	a)	Draw and explain the operation of Bidirectional sampling gate.	CO1	7 Marks
	b)	Draw and explain the operation of ECL NOR/OR circuit.	CO1	7 Marks

CODE No.: 16BT40502 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

DATABASE MANAGEMENT SYSTEMS

[Common to Computer Science and Engineering, Computer Science and Systems Engineering, Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Discuss the features of ER-models?	CO2	7 Marks
	b)	Define Data Abstraction and discuss levels of Abstraction.	CO1	7 Marks
		(OR)		
2	a)	What are the various types of attributes? Explain each with an example.	CO5	7 Marks
	b)	List the different types of database users? Write in detail about their roles.	CO1	7 Marks
		UNIT-II		
3	a)	Illustrate different set operations in relational algebra with examples.	CO5	7 Marks
	b)	Explain in detail how to query relational data.	CO5	7 Marks
		(OR)		
4	a)	Explain about any four relational algebra operations with examples.	CO5	7 Marks
	b)	Differentiate DRC and TRC.	CO2	7 Marks
		UNIT-III		
5	a)	Define trigger and explain its three parts? Differentiate row level and statement level triggers.	CO2	7 Marks
	b)	Discuss about Complex Integrity Constraints in SQL.	CO1	7 Marks
		(OR)		
6	a)	Discuss about Join dependencies and Fifth normal form.	CO1	7 Marks
	b)	What is the form of basic SQL query? Explain.	CO1	7 Marks
		UNIT-IV		
7	a)	Illustrate concurrent execution of transaction with examples?	CO5	7 Marks
	b)	Discuss Serializability in detail.	CO1	7 Marks
		(OR)		
8	a)	Explain the concept of shadow paging with a suitable example.	CO2	7 Marks
	b)	Describe the various transaction states in detail.	CO1	7 Marks
		UNIT-V		
9	a)	Explain in detail about ISAM?	CO1	7 Marks
	b)	Explain B+ trees? Discuss about the Dynamic Index Structure?	CO3	7 Marks
		(OR)		
10	a)	Describe the Intuitions for tree Indexes in detail.	CO1	7 Marks
	b)	Discuss in detail about RAID.	CO1	7 Marks

❀ ❀ ❀

CODE No.: 16BT41201 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations December-2022

DESIGN AND ANALYSIS OF ALGORITHMS

[Common to Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

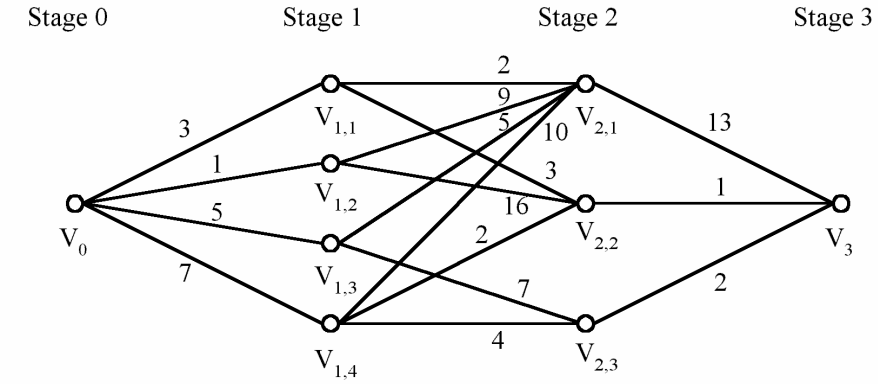
1	a)	Briefly describe the asymptotic notation of algorithms.	CO1	7 Marks
	b)	Design an algorithm for finding the number of binary digits for a positive decimal integer.	CO3	7 Marks
		(OR)		
2	a)	Consider two functions $f(n) = 3n^2+5$ and $g(n)=n^2$. Prove with graphical representation that asymptotic upper bound of f(n) is g(n).	CO2	7 Marks
	b)	Distinguish between Big Oh and Big Omega notation.	CO2	7 Marks

UNIT-II

3	a)	Explain weighted UNION rule with an example.	CO1	7 Marks
	b)	Outline an algorithm for weighted union rule and calculate its time complexity.	CO2	7 Marks
		(OR)		
4	a)	Explain BFS algorithm with an example.	CO1	7 Marks
	b)	Differentiate BFS and DFS.	CO2	7 Marks

UNIT-III

5	a)	Explain the control abstraction for Divide and conquer.	CO1	7 Marks
	b)	Explain binary search algorithm and find its time complexity.	CO4	7 Marks
		(OR)		
6	a)	Determine the shortest path from V0 to V3 of the following electrical network graph, using greedy method. Identify the optimal solution. Does greedy method gives an optimal solution?	CO1	10 Marks



	b)	Prove that the edge with the smallest weight will be part of every minimum spanning tree.	CO4	4 Marks

UNIT-IV

7	a)	State sum of subset problem. How to solve this problem using backtracking, explain it with suitable example?	CO1, CO4	7 Marks
	b)	Illustrate a recursive backtracking algorithm to solve sum of subset problem.	CO3	7 Marks
		(OR)		
8	a)	Draw the state space tree for m coloring when n=3 and m=3.	CO2	7 Marks
	b)	Solve the 8-queens problem using backtracking.	CO5	7 Marks

UNIT-V

9	a)	State 15-puzzle problem. Solve 15-puzzle problem using state space tree	CO1, CO4	9 Marks
	b)	Outline the control abstraction for LC search.	CO1	5 Marks
		(OR)		
10	a)	Explain about Nondeterministic and Deterministic algorithms.	CO1	7 Marks
	b)	Explain in detail about NP-hard and NP-Complete problems.	CO1	7 Marks

CODE No.: 16BT41202 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, December 2022

JAVA PROGRAMMING

[Common to Computer Science and Engineering; Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the steps involved in creating and executing a java program.	CO1	7 Marks
	b)	Design a program to implement Money class. This class should have fields for initializing a rupee and paisa value. The paisa value will be in the range from 0 – 99 with the paisa being the same sign as that of rupees. The class should have all reasonable constructors, addition and substraction methods, and a **main()** method that provides a thorough test of all the methods in the class.	CO6	7 Marks
		(OR)		
2	a)	Java compiled and interpreted. Justify.	CO4	5 Marks
	b)	Create a class Rectangle. The class has two attributes, length and width, each of which defaults to 0. It has methods that calculate the perimeter and area of the rectangle. It has set and get methods for both length and width. The set methods should verify that length and width are floating – point numbers larger than 0.0 and less than 20.0.	CO3	9 Marks

UNIT-II

3	a)	Explain final keyword with all its usages. Support explanation with a program.	CO1	7 Marks
	b)	Explain the various forms of implementing interfaces.	CO1	7 Marks
		(OR)		
4	a)	What are Nested Interfaces? Explain with a suitable example.	CO1	7 Marks
	b)	Create a class within the package "AmountInWords" to convert the amount into words. (Consider the amount to be nor more than 100000.)	CO3	7 Marks

UNIT-III

5	a)	Explain the steps in creating a thread using Runnable interface.	CO1	6 Marks
	b)	Design a java program that demonstrates how a high-priority thread using sleep makes way for the lower-priority threads to execute.	CO3	8 Marks
		(OR)		
6	a)	What is a try-with-resources block and how it is used?	CO1	4 Marks
	b)	Consider a Student examination database system that prints the marksheet of students. Input the following from the command line: i) Student's name ii) Marks in six subjects These marks should be between 0 to 100. If the marks are not in the specified range, raise a RangeException, else find the total marks and print the percentage of the student.	CO6	10 Marks

UNIT-IV

7	a)	Design a program that shows a screen sot with an applet running inside the applet viewer. The applet should display your name.	CO5	6 Marks
	b)	Explain the difference between with a suitable example: i) Vector and ArrayList. ii) Enumeration and Iterator.	CO1	8 Marks
		(OR)		

8	a)	Explain the use of overriding the following methods for an applet. init() start() stop() destroy() paint()	CO1	6 Marks
	b)	Create a collection class named Queue to implement the FIFO order of queues.	CO3	8 Marks

UNIT-V

9	a)	How is the concept of inner classes used for event handling?	CO2	7 Marks
	b)	What is the difference between doGet () and doPost () or GET and POST?	CO1	7 Marks

(OR)

10	a)	What do you mean by HTTP servlet request and response? What is the procedure for initializing a servlet?	CO1	7 Marks
	b)	What is the advantage of having anonymous classes while handling events in Java?	CO1	7 Marks

CODE No.:16BT41203 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

SOFTWARE ENGINEERING

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	How RAD Model solves inherent problems that result in software project? Explain with an application.	CO1	7 Marks
	b)	What is prototype? Explain the process of prototype development with diagram. Mention benefits of using prototype.	CO1	7 Marks
		(OR)		
2	a)	What is Agility in context of software engineering? Explain extreme programming (XP) with suitable diagram.	CO1	7 Marks
	b)	Explain briefly about Unified process model.	CO1	7 Marks

UNIT-II

3		Explain briefly requirements engineering process.	CO2	14 Marks
		(OR)		
4		Draw use case and dataflow diagrams for a restaurant system the activities of the restaurant system are listed below. Receive the customer food orders, produce the customer ordered foods, serve the customer with their ordered foods, collect payment from customers, store customer payment details, order raw materials for food products, pay for raw materials and pay for labor.	CO3	14 Marks

UNIT-III

5	a)	What are the design principles of a good software design? Explain them.	CO3	7 Marks
	b)	Explain with the help of suitable diagram architecture trade off analysis method.	CO4	7 Marks
		(OR)		
6	a)	Explain briefly software architecture style and architecture pattern.	CO3	7 Marks
	b)	Describe the golden rules for interface design?	CO3	7 Marks

UNIT-IV

7	a)	What is cyclomatic complexity? Explain with an example how to construct a flow graph for a program (Fibonacci series) and compute cyclomatic complexity.	CO5	7 Marks
	b)	What are the various testing strategies to software testing? Discuss them briefly?	CO5	7 Marks
		(OR)		
8	a)	What is black box testing? Is it necessary to perform this? Explain various test activities.	CO5	7 Marks
	b)	What is white box testing? Is it necessary to perform this? Explain various test activities.	CO5	7 Marks

UNIT-V

9	a)	Describe the Mc Call's quality factors and ISO 9126 quality factors.	CO6	7 Marks
	b)	Discuss Reactive and proactive risk strategies.	CO6	7 Marks
		(OR)		
10	a)	Explain RMMM& RMMM plan.	CO6	7 Marks
	b)	Discuss about SQA.	CO6	7 Marks

❀ ❀ ❀

CODE No.: 16BT41204 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-16) Supplementary Examinations, December - 2022

THEORY OF COMPUTATION

[Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Construct a DFA equivalent to the NFA. CO3 10 Marks
M=({p,q,r},{0,1},δ,p,{q,s}) Where δ is defined in the following table:

	0	1
p	{q,s}	{q}
q	{r}	{q,r}
r	{s}	{p}
s	-	{p}

b) Tabulate the differences between Moore and Mealy machines. CO2 4 Marks

(OR)

2 a) Convert the following ε-NFA to DFA CO5 10 Marks

states	ε	a	b	C
p	Φ	{p}	{q}	{r}
q	{p}	{q}	{r}	Φ
*r	{q}	{r}	Φ	{p}

b) List and explain briefly about the components of Finite automaton model. CO1 4 Marks

UNIT-II

3 a) Construct a NFA equivalent to the regular expression (10+11)*00. CO5 10 Marks

b) Prove that the language $L=\{a^m b^n | m=n\}$ is not regular. CO5 4 Marks

(OR)

4 a) List the applications of regular expressions and write the regular expression for following sets: CO3 7 Marks

i) The set of all strings over {0,1} having at most one pair of 0's or at most of one pair of 1's.

ii) The set of all strings over {a,b} in which there are at least two occurrences of b between any two occurrences of a.

b) State and explain pumping lemma for regular languages. List the applications of pumping lemma. CO1 7 Marks

UNIT-III

5 a) Obtain a CFG to generate the set of all strings over alphabet {a,b} with exactly twice as many a's as b's. CO3 7 Marks

b) Show that the grammar is ambiguous. CO1 7 Marks
S→aSbS|bSaS|Є

(OR)

6	a)	Remove useless symbols and use less productions from the given grammar S → aAa A → Sb|bcc|DaA C → abb|DD E → ac D → aDA	CO2, CO5	8 Marks
	b)	Explain pumping lemma for context free languages.	CO1	6 Marks
		UNIT-IV		
7	a)	Define pushdown automata and explain its model with a neat diagram.	CO3	6 Marks
	b)	Construct PDA generating all odd palindromes over string {a, b, c}.	CO3	8 Marks
		(OR)		
8	a)	Construct PDA for the following grammar S → aABB|aAA A → aBB|a B → A.	CO2, CO3	10 Marks
	b)	Write short notes on Deterministic Pushdown Automata.	CO1	4 Marks
		UNIT-V		
9		Define Turing machine and give an example. Also explain different types of TM's.	CO1	14 Marks
		(OR)		
10	a)	Differentiate multi tape and multi stack Turing machines.	CO2	7 Marks
	b)	Design a Turing machine that computes a function f(x, y) = x + y.	CO4	7 Marks

CODE No.: 19BT40103 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

HYDRAULIC ENGINEERING
[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What is the 'no slip condition' at the boundary? Explain boundary layer concept with a neat sketch.	6 Marks	L2	CO1	PO1 PO10
	b)	An aeroplane weighing 39.24 kN is flying in a horizontal direction at 360 km/h. The plane spans 15 m and has a wing surface area of 35 sq.m. If drag coefficient is 0.03 and density of air is 1.22 kg/m^3, determine coefficient of lift, power required to drive the plane and theoretical value of the boundary layer circulation.	6 Marks	L4	CO1	PO1 PO2 PO4 PO5
		(OR)				
2.	a)	Define momentum thickness and energy thickness and explain the characteristics of boundary layer with a neat sketch.	6 Marks	L2	CO1	PO1 PO10
	b)	Discuss different types of boundary layer thickness. The velocity distribution in the boundary layer is given by $u/U = y/\delta$, where u is the velocity at a distance y from the plate and $u = U$ at $y = \delta$, δ being boundary layer thickness. Find the displacement, momentum and energy thickness.	6 Marks	L4	CO1	PO1 PO2 PO4 PO10

UNIT-II

3.	a)	Classify the types of flow in channels and explain in detail.	6 Marks	L4	CO2	PO1 PO2 PO10
	b)	How the flows are classified under specific energy concept and find the discharge through a rectangular channel of width 2 m, having a bed slope of 4 in 8000? The depth of flow is 1.5 m. Use Chezy's formula, Take C = 76.	6 Marks	L6	CO2	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO10
		(OR)				
4.	a)	Determine the most economical section of rectangular channel carrying water at the rate of 0.6 cumecs. The bed slope of the channel is 1 in 2000. Assume Chezy's constant C=50.	6 Marks	L6	CO2	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO10
	b)	Find the rate of flow and conveyance for a rectangular channel 7.5 m wide for uniform flow at a depth of 2.25 m. The channel is having bed slope as 1 in 1000. Take Chezy's constant C = 55.	6 Marks	L6	CO2	PO1 PO2 PO3

		Also state whether the flow is tranquil or rapid.				PO4 PO5 PO6 PO7 PO10
		UNIT-III				
5.	a)	Derive an expression for force exerted by the jet on the stationary plate: i) When flat plate is held normal to the jet; ii) When flat plate is held inclined to the jet; iii) When plate is curved.	6 Marks	L4	CO3	PO1 PO2 PO4 PO10
	b)	A jet of water strikes with a velocity of 35 m/s a flat plate inclined at 30° with the axis of the jet. If the cross-sectional area of the jet is 25 cm^2, determine: i) The force exerted by the jet on the plate. ii) The components of the force in the direction normal to the jet. iii) The ratio in which the discharge gets divided after striking the plate.	6 Marks	L4	CO3	PO1 PO2 PO4 PO6 PO10
		(OR)				
6.	a)	Derive an expression for impact of jet on a fixed curved plate. A jet of water 5 cm in diameter and moving with a velocity of 15 m/s impinges on a series of vanes moving with a velocity of 5 m/s. Determine force on the plates, work done per second and efficiency of the jet.	6 Marks	L4	CO3	PO1 PO2 PO4 PO6 PO10
	b)	A jet of water, 60 mm in diameter, strikes a curved vane at its centre with a velocity of 18 m/s. The curved vane is moving with a velocity of 6 m/s in the direction of the jet. The jet is deflected through an angle of 165°. Assuming the plate to be smooth, find: i) Thrust on the plate in the direction of jet, ii) Power of the jet, and. iii) Efficiency of the jet.	6 Marks	L4	CO3	PO1 PO2 PO4 PO6 PO10
		UNIT-IV				
7.	a)	A Pelton wheel is to be designed for the following specifications: Power (brake or shaft) = 9560 kW Head =350 meters Speed = 750 r.p.m. Overall efficiency = 85% Jet diameter = not to exceed $1/6^{th}$ of the wheel diameter Determine the following: i) The wheel diameter, ii) Diameter of the jet, and iii) The number of jets required. Take C_v = 0·985, Speed ratio = 0.45.	6 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO10
	b)	i) Classify the turbines based on a) Action of water on turbine blades. b) Head on turbine. c) Direction of flow through turbine runner. d) Specific speed. e) Disposition of turbines shaft. ii) Distinguish between impulse turbine and reaction turbine	6 Marks	L4	CO4	PO1 PO2 PO10

(OR)

8.	a)	The water available for a Pelton wheel is 4 m^3/s and the total head from the reservoir to the nozzle is 250 m. The turbine has two runners with two jets per runner. All the four jets have the same diameters. The pipe is 3 km long. The efficiency of transmission through the pipeline and the nozzle is 91% and efficiency of each runner is 90%. The velocity co-efficient of each nozzle is 0·975 and co-efficient of friction '4f' for the pipe is 0·0045. Determine: i) The power developed by the turbine, ii) The diameter of the jet, and iii) The diameter of the pipeline.	6 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO10
	b)	A kaplan turbine is to be designed to develop 9100 kW. The net available head is 5.6 m. The speed ratio is 2.09 and the flow ratio is 0.68. The overall efficiency is 86% and the diameter of the boss is one-third the diameter of the runner. Examine i) Diameter of the runner ii) Speed iii) Specific speed of the turbine	6 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO10

UNIT-V

9.	a)	Mention the main parts of centrifugal pump. A centrifugal pump having outer diameter equal to two times the inner diameter and running at 1000 rpm works against a total head of 40 m. The velocity of flow through the impeller is constant and equal to 2.5 m/s. The vanes are set back at an angle of 40 degrees at outlet. If the outer diameter of the impeller is 500 mm and width at outlet is 50 mm. Calculate the following: i) Vane angle at inlet. ii) Work done by impeller on water per second. iii) Manometric efficiency.	6 Marks	L6	CO5	PO1 PO2 PO3 PO4 PO6 PO10
	b)	What do you mean by multistage pump and when two geometrically similar pumps are running at the same speed of 1000 rpm. One pump has an impeller diameter of 300 mm and lifts water at the rate of 0.02 cumec against a head of 15 m. Determine the head and impeller diameter of the other pump to deliver half the discharge.	6 Marks	L6	CO5	PO1 PO2 PO3 PO4 PO5 PO6 PO10

(OR)

10.	a)	The impeller of a centrifugal pump is 1.45 m diameter and discharges 2 cumec against a head of 6.5 m. The vane angle at the outlet is 145 degrees to the direction of motion. Speed of impeller is 200 rpm. The radial velocity of flow at outlet is 3.6 m/s. Find the manometric efficiency and minimum speed to start the pump. Assume suitable data required.	6 Marks	L4	CO5	PO1 PO2 PO4 PO6 PO10
	b)	Write the components of reciprocating pump with a neat sketch and explain concept of pumps in parallel and series.	6 Marks	L2	CO5	PO1 PO10

CODE No.: 19BT40105 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

STRUCTURAL ANALYSIS

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	A beam AB of length 'l' is supported at the ends carries a point load 'W' at a distance 'a' from the left end and 'b' from the right end. Determine the deflection under the load.	6 Marks	L4	CO1	PO1 PO2 PO10
	b)	A cantilever beam of span 4 m carries a point load 'w' at its free end. The moment of inertia of the section is 8500 cm^4. If the deflection at the free end is not to exceed 0.75 cm, what must be the value of W? Take E = 210 GN/m^2.	6 Marks	L4	CO1	PO1 PO2 PO4 PO10
		(OR)				
2.		A steel girder of uniform section, 14 m long is simply supported at its ends. It carries concentrated loads of 90 kN and 60 kN at two points 3 meters and 4.5 meters from the two ends respectively. Calculate: i) The deflection of the girder at the two points under the loads. ii) The maximum deflection.	12 Marks	L4	CO1	PO1 PO2 PO4 PO10

UNIT-II

3.	a)	Derive the expression for strain energy due to bending moment.	6 Marks	L4	CO1	PO1 PO2 PO10
	b)	Determine the deflection under 60 kN load in the beam shown in Fig.1.	6 Marks	L4	CO1	PO1 PO2 PO4 PO10

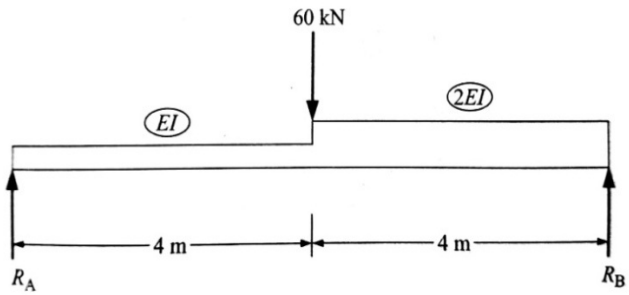


Fig.1

(OR)

4.		Analyze a fixed beam AB of span 'l' carrying a point load W at the mid-span. Draw the shear force and bending moment diagrams.	12 Marks	L4	CO2	PO1 PO2 PO10

UNIT-III

5.	A continuous beam of uniform cross – section is loaded as shown in the Fig.2. Find the following: i) Moments at the supports. ii) Reactions at the supports. iii) Points of contra flexure.	12 Marks	L4	CO3	PO1 PO2 PO4 PO10

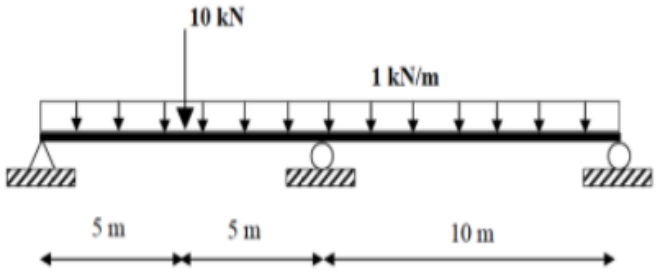


Fig.2

(OR)

6.	Analyze the two-span continuous beam shown in Fig.3 by slope deflection method and draw the bending moment and shear force diagrams. Assume EI is constant throughout.	12 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO10

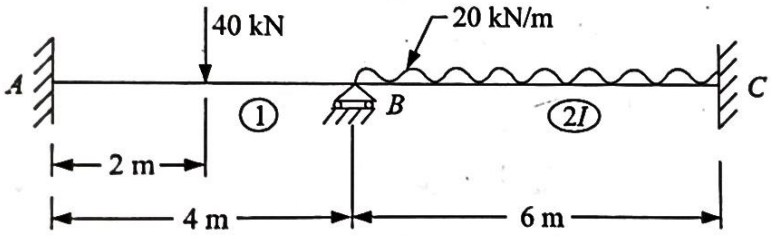


Fig.3

UNIT-IV

7.	Analyse the continuous beam shown in Fig.4 by moment distribution method and draw the bending moment and shear force diagram.	12 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO10

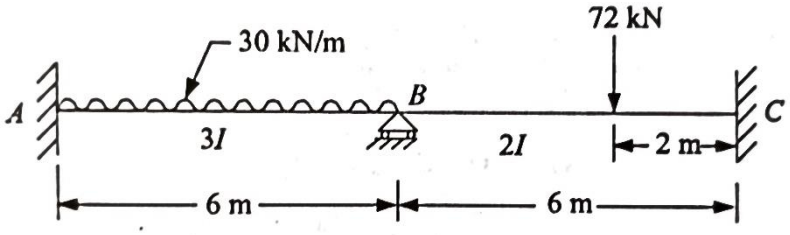


Fig.4

(OR)

8.	Analyze the continuous beam shown in Fig.5 by Kani's method.	12 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO10

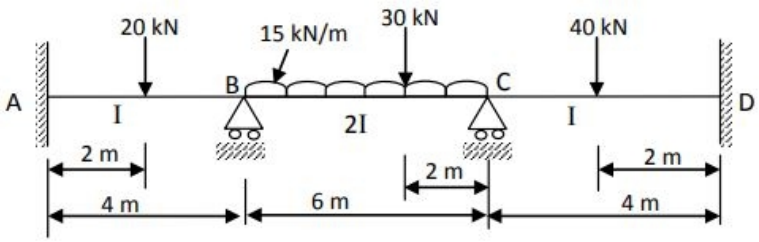


Fig.5

UNIT-V

9.	a)	A single point load of 80 kN crosses a girder of 12 m span. Using influence lines, find the maximum positive and negative shear forces at a point 4 m from the left end.	6 Marks	L4	CO4	PO1 PO2 PO4 PO10
	b)	A uniformly distributed load of 500 kN/m longer than the span, rolls over a beam of span 25 m. Using influence lines determine the maximum bending moment at a section 10 m from the left end.	6 Marks	L4	CO4	PO1 PO2 PO4 PO10
		(OR)				
10.		A T-section consists of a flange 150x10mm and a web of 140x10mm. The section modulus of the T-section is 54600mm^3 This section is used as a simply supported beam of 4m span and carries a UDL of 25kN/m on the whole span. Determine the shape factor of the beam and also calculate the collapse load for the beam. Assume yield stress as 250 Mpa.	12 Marks	L4	CO5	PO1 PO2 PO4 PO6 PO10

CODE No.: 19BT40201 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

DIGITAL ELECTRONICS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Explain the properties of EX-OR gate.	4 Marks	L1	CO1	PO1
	b)	Prove the following using Boolean algebra. i) y'z' + w'x'z' + w'xyz' + wyz' = z' ii) ABC + A'B'C + A'BC +ABC' + A'B'C' = A'B' + B(A + C).	8 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Simplify the Boolean function using K-map in SOP and POS forms F=∑m(0,1,2,4,7,8,12,14,15,16,17,18,20,24,28,30,31)	6 Marks	L2	CO1	PO5
	b)	Implement the following logical expression using AND-OR-INVERTER gates and also using only NOR gates for a digital data processing application. F= A + BC'(D' + BE').	6 Marks	L3	CO1	PO5

UNIT-II

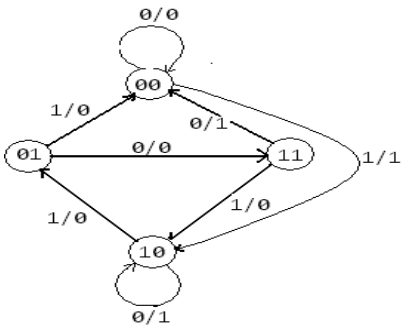
3.	a)	Illustrate three bit magnitude comparator with an example.	6 Marks	L2	CO2	PO2
	b)	Construct a 16×1 multiplexer with two 8×1 and one 2×1 multiplexers using block diagram representation.	6 Marks	L3	CO2	PO4
		(OR)				
4.	a)	Demonstrate a Half adder. Design a full adder circuit optimally using two half adder circuits.	6 Marks	L3	CO2	PO3
	b)	Implement the Boolean function F(A,B,C,D)=∑m(0,1,3,4,8,9,15) using 4:1 Mux.	6 Marks	L3	CO2	PO5

UNIT-III

5.	a)	Describe race-around problem in JK Flip-flop. Explain how it is eliminated in Master slave JK Flip –Flop.	6 Marks	L2	CO3	PO2
	b)	Design Mod-10 Counter using T Flip-Flops.	6 Marks	L3	CO3	PO3
		(OR)				
6.	a)	Illustrate and explain a 3-bit Johnson counter.	6 Marks	L2	CO3	PO1
	b)	Design a 3-bit synchronous UP/DOWN counter using D-flip-flops	6 Marks	L3	CO3	PO3

UNIT-IV

7.	a)	A sequential circuit has one input and one output. The state diagram is shown in below figure. Design the sequential circuit with (i)SR Flip-Flop (ii) D Flip-Flop	8 Marks	L2	CO4	PO5



b)	Realize a Logic function using F (A, B, C) = Σ_m (2,4,5,6) using Hazard Free logic gate network.	4 Marks	L2	CO4	PO5

(OR)

8.	Explain the procedure of state minimization for state table given below using the merger graph.	12 Marks	L2	CO4	PO5

Present state	Next state, Z			
	I_1	I_2	I_3	I_4
A	-	C,1	E,1	B,1
B	E,0	-	-	-
C	F,0	F,1	-	-
D	-	-	B,1	-
E	-	F,0	A,0	B,1
F	C,0	-	B,0	C,1

UNIT-V

9.	Tabulate the PLA programming table for the four Boolean functions listed below. Minimize the number of product terms. A(x, y, z) = Σ(1,2,4,6) B(x, y, z) = Σ(0,1,6,7) C(x, y, z) = Σ(2,6) D(x, y, z) = Σ(1,2,35,7)	12 Marks	L2	CO5	PO2

(OR)

10.	Show the step-by-step multiplication process using Booth algorithm for +15 and -13 which are binary. Assume 5-bit registers that hold signed numbers. The multiplicand is +15 and the multiplier is -13.	12 Marks	L3	CO5	PO2

CODE No.: 19BT40301 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December - 2022

DYNAMICS OF MACHINERY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		A dry single plate clutch is to be designed for an automotive vehicle whose engine is rated to give 100 kW at 2400 r.p.m. and maximum torque 500 N-m. The outer radius of friction plate is 25% more than the inner radius. The intensity of pressure between the plate is not to exceed 0.07 N/mm^2. The coefficient of friction may be assumed equal to 0.3. The helical springs required by this clutch to provide axial force necessary to engage the clutch are eight. If each spring has stiffness equal to 40 N /mm, determine the initial compression in the springs and dimensions of the friction plate.	12 Marks	L3	CO1	PO1 PO2 PO3
		(OR)				
2.	a)	List various types of brakes and what is the self locking of brake?	4 Marks	L1	CO1	PO1
	b)	Write a short note on absorption brake dynamometers with neat sketches.	8 Marks	L2	CO1	PO1 PO2

UNIT-II

3.		A ship propelled by a turbine rotor which has a mass of 5 tonnes and a speed of 2100 r.p.m. The rotor has a radius of gyration of 0.5 m and rotates in a clockwise direction when viewed from the stern. Find the gyroscopic effects in the following conditions: 1. The ship sails at a speed of 30 km/h and steers to the left in a curve having 60 m radius. 2. The ship pitches 6 degree above and 6 degree below the horizontal position. The bow is descending with its maximum velocity. The motion due to pitching is simple harmonic and the periodic time is 20 seconds. 3. The ship rolls and at a certain instant it has an angular velocity of 0.03 rad/s clockwise when viewed from stern. Determine also the maximum angular acceleration during pitching. Explain how the direction of motion due to gyroscopic effect is determined in each case.	12 Marks	L3	CO2	PO1 PO2 PO3 PO4
		(OR)				
4.		The turning moment curve for an engine is represented by the equation, T = (20 000 + 9500 sin 2θ – 5700 cos 2θ) N-m, where θ is the angle moved by the crank from inner dead centre. If the resisting torque is constant, find: 1. Power developed by the engine ; 2. Moment of inertia of flywheel in kg-m2 , if the total fluctuation of speed is not exceed 1% of mean speed which is 180 r.p.m; and 3. Angular acceleration of the flywheel when the crank has turned through 45° from inner dead centre.	12 Marks	L3	CO3	PO1 PO2 PO3

UNIT-III

5.		In a spring loaded governor of the Hartnell type, the mass of each ball is 1kg, length of vertical arm of the bell crank lever is 100 mm and that of the horizontal arm is 50 mm. The distance of fulcrum of each bell crank lever is 80 mm from the axis of rotation of the governor. The extreme radii of rotation of the balls are 75 mm and 112.5mm. The maximum equilibrium speed is 5 per cent greater than the minimum equilibrium speed which is 360 r.p.m. Find, neglecting obliquity of arms, initial compression of the spring and equilibrium speed corresponding to the radius of rotation of 100 mm.	12 Marks	L3	CO4	PO1 PO2 PO3 PO4

(OR)

6.		The upper arms of a Porter governor has lengths 350 mm and are pivoted on the axis of rotation. The lower arms has lengths 300 mm and are attached to the sleeve at a distance of 40 mm from the axis. Each ball has a mass of 4 kg and mass on the sleeve is 45 kg. Determine the equilibrium speed for a radius of rotation of 200 mm and find also the effort and power of the governor for 1 per cent speed change.	12 Marks	L2	CO4	PO1 PO2 PO3 PO4

UNIT-IV

7.	a)	Write the importance of balancing?	4 Marks	L1	CO5	PO1
	b)	A shaft carries four masses in parallel planes A, B, C and D in this order along its length. The masses at B and C are 18 kg and 12.5 kg respectively, and each has an eccentricity of 60 mm. The masses at A and D have an eccentricity of 80 mm. The angle between the masses at B and C is 100° and that between the masses at B and A is 190°, both being measured in the same direction. The axial distance between the planes A and B is 100 mm and that between B and C is 200 mm. If the shaft is in complete dynamic balance, Determine : i) The magnitude of the masses at A and D ; ii) the distance between planes A and D ; and iii) the angular position of the mass at D.	8 Marks	L3	CO5	PO1 PO2 PO3 PO6

(OR)

8.	a)	Explain the terms Variation of Tractive Force, Swaying Couple, Hammer Blow.	4 Marks	L2	CO5	PO1 PO2
	b)	The following data refer to two cylinder locomotive with cranks at 90°: Reciprocating mass per cylinder = 300 kg ; Crank radius = 0.3 m ; Driving wheel diameter = 1.8 m ; Distance between cylinder centre lines = 0.65 m ; Distance between the driving wheel central planes = 1.55 m. Determine : i) The fraction of the reciprocating masses to be balanced, if the hammer blow is not to exceed N at 96.5 km. p.h. ; ii) The variation in tractive effort; and iii) The maximum swaying couple.	8 Marks	L3	CO5	PO1 PO2 PO3

UNIT-V

9.	a)	What are the causes and effects of vibrations?	4 Marks	L2	CO6	PO1
	b)	Establish an expression for the natural frequency of free transverse vibrations for a simply supported beam carrying a number of point loads, by Dunkerley's method.	8 Marks	L2	CO6	PO1 PO2 PO3
		(OR)				
10.	a)	Explain about the Magnification Factor in forced vibration.	4 Marks	L2	CO6	PO1 PO2
	b)	With neat sketch explain the Free Torsional Vibrations of a Three Rotor System, and deduce the equation for Torsionally Equivalent Shaft.	8 Marks	L2	CO6	PO1 PO2

CODE No.: 19BT40302 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

ENGINEERING METROLOGY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Differentiate between line standards and end standards.	6 Marks	L 2	CO1	PO1 PO2
	b)	Distinguish between Hole basis system and Shaft basis system	6 Marks	L1	CO1	PO1 PO2
		(OR)				
2.		Compare and contrast between Interchangeability and Selective assembly with illustrative examples.	12 Marks	L 2	CO1	PO1 PO2
		UNIT-II				
3.		With the help of neat sketches, explain how a sine bar is used to determine the taper angle of an inclined surface? Name the various factors affecting the accuracy of the sine bar.	12 Marks	L 2	CO2	PO1 PO2
		(OR)				
4.	a)	Sketch and explain the working principle of sigma comparator.	6 Marks	L2	CO2	PO1
	b)	Write a short notes on angle gauges.	6 Marks	L2	CO2	PO1
		UNIT-III				
5.		The heights of peaks and valleys of 20 successive points on a surface are 80,60, 88, 66, 78, 62, 80, 62, 81, 63, 83, 62, 80, 60, 80, 60, 81, 59, 82, 62 microns respectively, measured over a length 20 mm, Determine CLA and RMS values of roughness surface.	12 Marks	L3	CO3	PO1 PO2 PO3
		(OR)				
6.		What is the principle of an Optical flat? Explain the procedure of performing flatness test using optical flat.	12 Marks	L2	CO3	PO2
		UNIT-IV				
7.		Explain the two wire method for finding effective diameter of screw threads and derive for best wire size.	12 Marks	L2	CO4	PO1
		(OR)				
8.		Sketch and explain the important parameters involved in gear measurement. Explain the working principle of any one gear measuring instrument.	12 Marks	L3	CO4	PO1 PO2
		UNIT-V				
9.		Define Strain Rosette .Sketch and explain the various types of strain gauges for different applications.	12 Marks	L1	CO5	PO1 PO2
		(OR)				
10.	a)	Explain working principle of Radiation Pyrometer.	6 Marks	L2	CO5	PO1
	b)	Explain with a neat sketch the working principle of dead weight pressure gauge.	6 Marks	L2	CO5	PO1

CODE No.: 19BT40303 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

FLUID MECHANICS AND HYDRAULIC MACHINERY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define viscosity and write down the units. And write down different types of fluids.	6 Marks	L1	CO1	PO1
	b)	A plate 0.025 mm distance from a fixed plate, moves at 60 cm/sec and requires a force of 2 N per unit area i.e., 2 N/m^2 to maintain this speed. Determine the fluid viscosity between the plates.	6 Marks	L2	CO1	PO1 PO2
		(OR)				
2.		At the right limb of a simple differential manometer containing the mercury is open to the atmosphere while the left limb is connected to a pipe in which a fluid of specific gravity 0.9 is flowing. The centre of the pipe is 12cm below the level of mercury in the right limb. Find the pressure of fluid in the pipe if the difference of mercury level in the two limbs is 20 cm.	12 Marks	L3	CO1	PO1 PO2

UNIT-II

3.		Define the equation of continuity. Obtain an expression for continuity equation for three dimensional flows in Cartesian coordinates.	12 Marks	L2	CO2	PO1
		(OR)				
4.		Derive an expression for the discharge through venturimeter.	12 Marks	L3	CO2	PO1

UNIT-III

5.		Define boundary layer and explain the fundamental causes of its existence.	12 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Outline the minor energy losses in pipes.	6 Marks	L1	CO3	PO1
	b)	The difference in water surface levels in two tanks, which are connected by three pipes in series of lengths 300 m, 170 m and 210 m and of diameters 300 mm, 200 mm and 400 mm respectively, is 12 m. determine the rate of flow of water if co-efficient of friction are 0.005, 0.0052 and 0.0048 respectively, considering: i) Minor losses also ii) Neglecting minor losses	6 Marks	L3	CO3	PO1 PO2 PO3

UNIT-IV

7.		Derive an expression for the force exerted by a jet of water on stationary flat vertical and inclined plates.	12 Marks	L3	CO4	PO1 PO2
		(OR)				

8.		Define the specific speed of a turbine? Derive an expression for the specific speed. What is the significance of the specific speed?	12 Marks	L3	CO4	PO1 PO2 PO3

UNIT-V

9.	a)	What do you mean by manometric efficiency, mechanical efficiency and overall efficiency of centrifugal pump?	6 Marks	L1	CO5	PO1
	b)	What is negative slip in a reciprocating pump? Explain with neat sketches the functions of air vessels in a reciprocating pump.	6 Marks	L2	CO5	PO1
		(OR)				
10.		A double acting reciprocating pump, running at 50 r.p.m. is discharging 900 litres of water per minute. The pump has stroke of 400 mm. The diameter of piston is 250 mm. The delivery and suction head are 25 m and 4 m respectively. Find the slip of the pump and power required to drive the pump.	12 Marks	L2	CO5	PO1 PO2 PO3

CODE No.: 19BT40304 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

METAL CUTTING AND MACHINE TOOLS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Discuss the principle and requirement of machining.	6 Marks	L2	CO1	PO1
	b)	Explain the geometry of twist drill and milling cutter.	6 Marks	L2	CO1	PO1 PO2
		(OR)				
2.		Analyze the nomenclature of ORS and NRS system with diagram.	12 Marks	L2	CO1	PO1 PO2
		UNIT-II				
3.	a)	Write short notes on shear strain and cutting forces with diagram.	6 Marks	L1	CO2	PO1 PO7
	b)	Define chips and recall the types of chips.	6 Marks	L1	CO2	PO1 PO7
		(OR)				
4.		Derive the expression for the various cutting forces using Merchant's circle diagram.	12 Marks	L3	CO2	PO1 PO2 PO3 PO7
		UNIT-III				
5.	a)	Differentiate work and tool holding devices in lathe.	6 Marks	L2	CO3	PO1 PO2 PO3
	b)	Write short notes on single-spindle and multi-spindle automatic lathes.	6 Marks	L1	CO3	PO1 PO2
		(OR)				
6.		Draw and explain the various operations performed on Lathe with neat diagrams.	12 Marks	L2	CO3	PO1 PO7
		UNIT-IV				
7.	a)	Compare slotting and drilling machines.	6 Marks	L2	CO4	PO1 PO7
	b)	List the specifications and types of drilling machine.	6 Marks	L1	CO4	PO1 PO7
		(OR)				
8.		What is boring? Explain the working principle of jig boring machine with neat diagram.	12 Marks	L2	CO4	PO1 PO2 PO7
		UNIT-V				
9.	a)	Write a brief note on grinding, lapping and honing in grinding machine.	6 Marks	L1	CO5	PO1 PO2 PO7
	b)	Discuss on working principle and operations in grinding machine with neat diagram.	6 Marks	L2	CO5	PO1
		(OR)				
10		Define milling and explain the methods of indexing used in	12 Marks	L2	CO6	PO1

. milling machine. PO7

CODE No.: 19BT40305 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

THERMAL ENGINEERING-I

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the time loss factor, heat loss factor and exhaust blow down losses.	6 Marks	L2	CO1	PO1
	b)	Explain the stages of combustion in SI engine with neat sketch.	6 Marks	L2	CO1	PO1 PO2
		(OR)				
2.	a)	Compare the relative advantages and disadvantages of four stroke and two stroke engines.	6 Marks	L2	CO1	PO1 PO2
	b)	List the important internal combustion engine parts and explain in detail.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	List out the Methods of obtaining Friction Power and explain any one of them in detail.	6 Marks	L2	CO1	PO1
	b)	In a laboratory experiment, the following observations were noted during the test of a four-stroke diesel engine. Area of the indicator diagram = 420mm Length of the indicator diagram = 62mm^2 Spring number = 1.1bar/min Diameter of the piston = 100mm Length of stroke = 150mm Engine speed = 450rpm Determine: i) Indicated mean effective pressure. ii) Indicated power.	6 Marks	L3	CO1	PO1 PO2 PO3
		(OR)				
4.	a)	The cubic capacity of 4 stroke over square SI Engine is 245cc. The over square ratio is 1.1. The clearance volume is 27.2cc. calculate the bore, stroke and compression ratio of the engine.	6 Marks	L3	CO1	PO1 PO2 PO3
	b)	Explain the significance of the following tests: i) Motoring test. ii) Morse test. iii) Retardation test.	6 Marks	L2	CO1	PO1
		UNIT-III				
5.		In a constant pressure open cycle gas turbine air enters at 1 bar and 20^{0}C and leaves the compressor at 5 bar. Using the following data: temperature of the gases entering the turbine = 680^{0}C, pressure loss in the combustion chamber = 0.1 bar, $\eta_{compressor}$ = 85%, $\eta_{turbine}$ = 80%, $\eta_{combustion}$ = 85%, γ =1.4, C_p=1.024kJ/kg K for air and gas. Find: i) the quality of air circulation if the plant develops 1065kW ii) Heat supplied per kg of circulation iii) Thermal efficiency of the cycle. Mass of fuel may be neglected.	12 Marks	L3	CO2	PO1 PO2 PO3
		(OR)				

6.	a)	Distinguish between rocket propulsion Engine and turbojet Engines.	6 Marks	L4	CO2	PO1
	b)	Explain the working of turbo jet engine with a neat sketch.	6 Marks	L2	CO2	PO1
		UNIT-IV				
7.	a)	Derive an expression for the work done by single stage single acting reciprocating air compressor.	6 Marks	L3	CO3	PO1 PO2
	b)	A three stage single acting reciprocating air compressor delivers 2.5 m^3 of free air per minute from 1 bar to 72 bar. Calculate the power required to operate compressor if n = 1.3. The mean piston speed is 140 m/min. Find the piston area, neglecting the clearance volume.	6 Marks	L3	CO3	PO1 PO2 PO3
		(OR)				
8.	a)	Explain the working principle of roots blower with a neat sketch.	6 Marks	L3	CO3	PO1
	b)	Classify air compressors and explain two stage reciprocating air compressor.	6 Marks	L2	CO3	PO1
		UNIT-V				
9.	a)	In a Rankine cycle the steam at inlet to the turbine is saturated at a pressure of 20 bar and exhaust pressure is 0.04 bar. Determine: i) Pump work. ii) Turbine Power. iii) Rankine efficiency. Assume the flow rate of steam as 10 kg/sec.	6 Marks	L3	CO4	PO1 PO2 PO3
	b)	Explain the working of binary vapor power cycle with suitable diagram.	6 Marks	L2	CO4	PO1
		(OR)				
10.	a)	Compare the efficiency of the Modified Rankine cycle with respect to Rankine cycle. Also obtain the expression for efficiency of Modified Rankine cycle.	6 Marks	L4	CO4	PO1 PO2
	b)	A basic steam power plant works on ideal Rankine cycle between 30 bar and 0.04 bar. The initial condition of steam being 0.8 dry and flow rate 10 kg/s determine: i) Work required for pumping ii) work done by the turbine iii) cycle efficiency.	6 Marks	L3	CO4	PO1 PO2 PO3

❀ ❀ ❀

CODE No.: 19BT40401 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

ANALOG COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	With a neat block diagram, explain the working of FDM technique.	6 Marks	L2	CO1	PO2
	b)	Discuss the appropriate amplitude modulation technique which requires modulated band width equal to the twice of message signal band width and more power consumption.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Draw the circuit of a balanced modulator. Give the mathematical analysis to explain how and why only the carrier is suppressed in a balanced modulator.	6 Marks	L2	CO1	PO2
	b)	With neat block diagram, explain the generation of SSB wave by phase discrimination method.	6 Marks	L3	CO1	PO2
		UNIT-II				
3.	a)	Derive the expression for NBFM if message is m(t) and carrier is $A_c Cos\omega_c t$. Draw the corresponding phasor diagram of NBFM and compare it with AM wave.	6 Marks	L1	CO1	PO2
	b)	An FM wave is defined by s(t)=10 cos(2+sin (6Πt). Find the instantaneous frequency of s(t).	6 Marks	L2	CO1	PO4
		(OR)				
4.	a)	Explain FM generation using direct method.	6 Marks	L4	CO1	PO1
	b)	An FM wave is defined by s(t)=10 cos (2 +sin (6πt)). Find the instantaneous frequency S(t).	6 Marks	L2	CO1	PO2
		UNIT-III				
5.	a)	Prove that narrow band FM offers no improvement in SNR over AM.	6 Marks	L4	CO2	PO2
	b)	An AM receiver operates with a tone modulation, and the modulation index ma=0.6. The message signal is 60 Sin (5000Πt). Calculate the output SNR relative to the baseband performance.	6 Marks	L4	CO2	PO2
		(OR)				
6.	a)	Discuss the role of pre-emphasis and de-emphasis in the improvement of noise immunity in FM.	6 Marks	L4	CO2	PO2
	b)	Prove that the figure of merit of AM system for single stone modulation with 100% modulation is 1/3.	6 Marks	L1	CO2	PO1
		UNIT-IV				
7.	a)	In a superhetrodyne receiver with no RF section, the 'Q' of the antenna coupling circuit is found to be 110. Calculate the image frequency and its rejection ratio at 1100 kHz.	6 Marks	L1	CO3	PO3
	b)	An FM radio link has a frequency deviation of 25 kHz. The	6 Marks	L1	CO3	PO4

		modulating frequency is 5 kHz. Calculate the bandwidth needed for the link. What will be the bandwidth if the deviation is reduced to 10 kHz?				
		(OR)				
8.	a)	Compare low level modulation and high level modulation of radio transmitters.	6 Marks	L4	CO3	PO2
	b)	For an FM modulator with a modulating signal m(t)= Vm sin300wt, the carrier Signal Vc(t)=8 sin(6.5×106)t and the modulator index β = 2. Find out the significant side frequencies and their amplitudes.	6 Marks	L1	CO3	PO3
		UNIT-V				
9.	a)	Discuss the performance analysis of pulse modulation schemes.	6 Marks	L1	CO4	PO1
	b)	Draw the wave forms of pulse modulations and explain briefly.	6 Marks	L3	CO4	PO2
		(OR)				
10.	a)	Explain how a PPM signal can be generated from a PWM signal?	6 Marks	L1	CO4	PO1
	b)	Define and distinguish between PTM and PAM schemes. Sketch and explain their waveform for a single tone sinusoidal input signal.	6 Marks	L2	CO4	PO1

CODE No.: 19BT40402 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

ELECTRONIC CIRCUIT ANALYSIS AND DESIGN

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Design Two stage RC coupled amplifier to meet the following specifications Av = 400, S=3, Vcc=12V, Ic=1mA, f_L =50Hz and Rs =500Ω. Assume data wherever necessary.	12 Marks	L6	CO1	PO3
		(OR)				
2.	a)	Recall the circuit diagram of a two-stage RC coupled amplifier and draw its frequency response.	6 Marks	L1	CO1	PO6
	b)	Explain the following terms with respect to the frequency response of an amplifier: i) Mid frequency region ii) Cutoff frequency iii) Band width	6 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Explain briefly about the small signal equivalent circuit of an emitter follower at high frequency.	6 Marks	L2	CO2	PO1
	b)	Define f_β and f_T. Develop the relation between f_β and f_T.	6 Marks	L1	CO2	PO1
		(OR)				
4.	a)	Construct an expressions for hybrid-π resistances r_{ce} and $r_{bb'}$ of a transistor.	6 Marks	L3	CO2	PO2
	b)	A transistor amplifier in CE configuration is operated at High frequency with the following specifications fT= 6 M Hz; gm = 0.04; hfe = 50; rbb'= 100 ohm ; Rs= 500 ohm; Cb'c = 120pf; RL = 100ohm. Estimate the Voltage gain, upper 3dB frequency and gain bandwidth product.	6 Marks	L5	CO2	PO2

UNIT-III

5.	a)	State the necessity of feedback in amplifiers and explain the effect of feedback on: i) Distortion ii) Noise iii) Bandwidth iv) Gain	8 Marks	L2	CO3	PO1
	b)	The gain (A_f) of an amplifier with feedback is to be nominally 20, and a variation of 5% is permissible. If the magnitude of the return ratio (Aβ) must be at least 1000(so that Aβ >>1), then determine the minimum valve of the open loop gain (A) and the maximum permissible variation in it.	4 Marks	L4	CO3	PO2
		(OR)				

6.	a)	Formulate current series feedback amplifier input and output resistance with and without feedback.	6 Marks	L2	CO3	PO2
	b)	An amplifier has voltage gain of 10,000 with ground plate supply of 150V and voltage gain of 8000 at reduced rate supply of 130V. On application of negative feedback the voltage gain at normal plate supply is reduced by a factor of 80. Calculate the i) Voltage gain of the amplifier with feedback for two valves of plate supply voltage. ii) Percentage reduction in voltage gain with reduction in plate supply voltage for both conditions, with and without feedback.	6 Marks	L3	CO3	PO2

UNIT-IV

7.	a)	Explain principle and operation of the Wien Bridge Oscillator and derive expression for frequency of oscillation.	8 Marks	L2	CO3	PO1
	b)	Compare RC and LC oscillators.	4 Marks	L5	CO3	PO2
		(OR)				
8.	a)	State the Barkhausen's criterion for oscillations.	5 Marks	L1	CO3	PO1
	b)	A Hartley oscillator is designed with L1= 20 μH; L2= 2 mH. Determine range of capacitances if frequency is varied between 950 KHz and 2050 kHz.	7 Marks	L3	CO3	PO2

UNIT-V

9.	a)	Explain in detail about the operation of class S power amplifier.	6 Marks	L3	CO5	PO1
	b)	Write the advantages and disadvantages of Transformer coupled Class-A amplifier.	6 Marks	L2	CO5	PO2
		(OR)				
10.	a)	Derive the equation for 3-dB bandwidth of Single tuned amplifier.	6 Marks	L3	CO5	PO2
	b)	A tuned circuit has resonance frequency of 800 KHz and a band width of 10 KHz. What is the value of its Q-factor?	6 Marks	L1	CO5	PO4

CODE No.: 19BT40403 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

LINEAR AND DIGITAL IC APPLICATIONS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Design a square waveform generator of frequency 100Hz and duty cycle of 70% using a 555 timer.	6 Marks	L3	CO1	PO3
	b)	Design a 555 timer based square wave generator to produce a symmetrical square wave of 2 kHz, if V_{cc}=12V, draw the voltage across timing capacitor and output.	6 Marks	L3	CO1	PO6
		(OR)				
2.	a)	Prove that an Op amp can be used to find the log of a given analog signal.	6 Marks	L2	CO1	PO2
	b)	Draw the block diagram of IC566 VCO and explain its operation.	6 Marks	L1	CO1	PO1

UNIT-II

3.	a)	Explain in brief the principle of operation of Flash type ADC.	6 Marks	L1	CO3	PO1
	b)	Explain the operation of a Dual-slope ADC and analyze it with flash type ADC.	6 Marks	L1	CO3	PO2
		(OR)				
4.	a)	Explain in brief the principle of operation of successive Approximation ADC.	6 Marks	L1	CO3	PO1
	b)	Design a second order Butterworth high pass filter with cut off frequency of 3 KHz.	6 Marks	L3	CO2	PO8

UNIT-III

5.	a)	What are the basic components of a module? Which components are mandatory in Verilog HDL?	6 Marks	L3	CO4	PO1
	b)	Write 4-to-1 multiplexer using case statement in dataflow modeling.	6 Marks	L3	CO5	PO1
		(OR)				
6.	a)	Illustrate the salient features of data flow design elements.	6 Marks	L1	CO4	PO2
	b)	Explain the sequential and parallel blocks in Verilog HDL with an example.	6 Marks	L1	CO4	PO1

UNIT-IV

7.	a)	Illustrate a 4 to 16 decoder using two 74*138 decoders and write the Verilog HDL code for it.	6 Marks	L3	CO5	PO2
	b)	Explain the importance of IC 74X181 in recent developments of processors.	6 Marks	L1	CO5	PO1
		(OR)				
8.	a)	Sketch the diagram and functional table of a 4-bit comparator and briefly explain about it. Write a Verilog HDL code for it in any modeling.	6 Marks	L2	CO5	PO2
	b)	Write a Verilog code for full adder using two half adders and an OR Gate.	6 Marks	L2	CO5	PO1

UNIT-V

9.	a)	Draw the logic diagram of 74×163 binary counter and explain its operation.	6 Marks	L1	CO5	PO1
	b)	Implement a modulo-11 counter using 74×163 binary counters.	6Marks	L3	CO5	PO4
		(OR)				
10.	a)	Sketch the symbol, functional table & write Verilog HDL source code of 74X194 IC.	6 Marks	L2	CO5	PO6
	b)	Design a 3-bit LFSR counter using 74x194.List out the sequence assuming that the initial state 111.	6 Marks	L3	CO5	PO3

CODE No.: 19BT40404 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

PROBABILITY AND STOCHASTIC PROCESSES

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	State and Prove Bayes theorem.	6 Marks	L2	CO1	PO1
	b)	In the experiment of throwing two fair dice, let ***A*** be the event that the first die is odd, B be the Event that the second die is odd, and C be the event that the sum is odd. Show that events ***A,*** B, and C are pair wise independent, but ***A, B,*** and C are not independent.	6 Marks	L2	CO1	PO4
		(OR)				
2.	a)	Given that P(A), P(B) = 0.8 and P(A ∩ B) = 0.75 Find: $i)\ P(A \cup B)$ $ii)\ P(A \cap B^c)$ $iii)\ P(A^c \cap B^c)$.	6 Marks	L2	CO1	PO4
	b)	Define Joint Probability and Conditional Probability	6 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Let X be a Random Variable with P.D.F a given by $f_x(x) = \begin{cases} 2x & 0 < x < 1 \\ 0 & otherwise \end{cases}$ Find the P.D.F of a random variable Y, if Y=2X+1.	6 Marks	L2	CO2	PO4
	b)	State and prove chebchev's inequality.	6 Marks	L3	CO2	PO2
		(OR)				
4.	a)	Define the following: i) Expected value of a function of a random variable. ii) Moments about the origin. iii) Central moments.	6 Marks	L3	CO2	PO1
	b)	State and prove properties of characteristic function of a random variable X.	6 Marks	L3	CO2	PO2

UNIT-III

5.	a)	The joint cdf of a bivariate random variable. (X, Y) is given by $F(x,y)$ $= \begin{cases} \left(1 - e^{-ax}\right)\left(1 - e^{-by}\right) & X \geq 0, Y \geq 0,\ a > 0, b > 0 \\ 0 & otherwise \end{cases}$ i) Find the marginal CDF's of X and Y. ii) Show that X and Y are independent.	6 Marks	L2	CO2	PO4
	b)	The random variable X and Y have the joint characteristic function. $\phi(w_1, w_2) = \exp(-2W_1^2 - 9W_2^2$. Show that X and Y are both are zero means and that they are uncorrelated.	6Marks	L2	CO2	PO4
		(OR)				
6.	a)	Discuss the Properties of Gaussian Random Variable.	6 Marks	L3	CO2	PO1
	b)	Explain the Linear Transformation of Gaussian Random Variables.	6 Marks	L3	CO2	PO1

UNIT-IV

7.	a)	Given a random process by X(t) = AC0S (πt), where A is Gaussian random variable with zero mean and variance $\sigma \frac{2}{x}$. i) Find the density function of X (0). ii) Is X(t) stationary in any sense.	6 Marks	L3	CO3	PO4
	b)	Distinguish between. i) Deterministic and non-deterministic process. ii) Stationary and non-stationary random process.	6 Marks	L2	CO3	PO2
		(OR)				
8.	a)	Derive the autocorrelation output of LTI system.	6 Marks	L2	CO3	PO2
	b)	Derive the relationship between cross correlation function and cross power spectrum.	6 Marks	L2	CO3	PO2

UNIT-V

9.	a)	Mention the differences between correlated and uncorrelated noise.	6 Marks	L3	CO4	PO1
	b)	Define thermal noise and explain its relationship to the bandwidth and temperature.	6 Marks	L3	CO4	PO1
		(OR)				
10.	a)	Explain the importance of Friss's Formula with the help of example.	6 Marks	L3	CO4	PO1
	b)	Discuss the following terms: i) Noise factor. ii) Noise Figure equivalent noise temperature.	6 Marks	L3	CO4	PO2

CODE No.: 19BT40441 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

ANALOG ELECTRONICS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Apply Bootstrapping Method for a Darlington amplifier to increase input impedance.	6 Marks	L2	CO1	PO6
	b)	Analyze a single stage common emitter amplifier with its equivalent circuit using approximation model.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Analyze the CE short circuit current gain as function of frequency also plots its frequency response.	6 Marks	L1	CO1	PO1
	b)	With the Help of Circuit diagram and its ac equivalent Circuit develop expression for the overall input impedance of the Darlington amplifier.	6 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	Use a Trans-resistance amplifier and prove its input and output impedances are very low compared to CE amplifier.	6 Marks	L2	CO2	PO5
	b)	Explain the method of analysis of feedback amplifier.	6 Marks	L1	CO2	PO1
		(OR)				
4.	a)	Calculate the gain, input impedance and output impedance of voltage series feedback amplifier having gain A = -300, Rin = 1.5 k-ohms and Rout = 50 k-ohms, β= 0.05.	6 Marks	L3	CO2	PO4
	b)	List the general characteristics of negative feedback amplifiers and explain.	6 Marks	L2	CO2	PO2
		UNIT-III				
5.	a)	Explain principle and operation of the RC phaseshift Oscillator using FET and derive expression for frequency of oscillation.	8 Marks	L1	CO2	PO1
	b)	State and explain the Barkhausen's criterion for Oscillations.	4 Marks	L1	CO2	PO1
		(OR)				
6.	a)	For the following parameters calculate the series resonant frequency and Q - factor of the crystal. L = 0.5H, C1 = 0.06pF, Ch = 2.0pF and R = 5KΩ.	6 Marks	L3	CO2	PO4
	b)	Draw the circuit diagram of Hartley oscillator with BJT, explain its operation and derive an expression for frequency of oscillations.	6 Marks	L2	CO2	PO2
		UNIT-IV				
7.	a)	Explain second harmonic distortion in power amplifiers.	6 Marks	L1	CO3	PO1
	b)	Compare push-pull and complementary class B power amplifier.	6 Marks	L3	CO3	PO2
		(OR)				
8.	a)	Design a class B power amplifier to obtain the maximum conversion efficiency is 78.5%.	6 Marks	L4	CO3	PO3
	b)	Select a power amplifier to get power efficiency 50% and explain briefly.	6 Marks	L1	CO3	PO5

UNIT-V

9.	a)	Analyze the first order low pass filter and derive an equation for its gain and also draw its frequency response curve.	6 Marks	L1	CO4	PO2
	b)	Design a high pass filter with a cut-off frequency of 10KHz with a pass band gain of 1.5.	6 Marks	L4	CO4	PO3
		(OR)				
10.	a)	Design monostable multivibrator circuit using 555 timer and describe in detail about its operation.	6 Marks	L4	CO4	PO3
	b)	Explain the applications of astable multivibrator using 555 timer.	6 Marks	L3	CO4	PO1

CODE No.: 19BT40502 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

DATABASE MANAGEMENT SYSTEMS

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Define Data Abstraction and discuss levels of Abstraction.	6 Marks	L1	CO1	PO1
	b)	Discuss about the Concept Design with the ER Model.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Explain different types of database users and write the functions of DBA.	6 Marks	L2	CO1	PO1
	b)	Explain basic notations of ER diagram.	6 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Analyze and find whether View exists if the table is dropped from the database.	6 Marks	L4	CO2	PO3
	b)	Illustrate different set operations in Relational algebra with an example.	6 Marks	L3	CO2	PO3
		(OR)				
4.	a)	Discuss about Complex integrity constraints in SQL.	6 Marks	L2	CO2	PO2
	b)	Explain Relational algebra. i) Write a relational expression to find the names of sailors who have reserved boat 103. ii) Write a relational expression to find the names of sailors who have not reserved a red boat.	6 Marks	L2	CO2	PO2
		UNIT-III				
5.		Define trigger and explain its three parts. Differentiate row level and statement level triggers.	12 Marks	L2	CO3	PO2
		(OR)				
6.	a)	Define a nested query. i) Write a nested query to find the names of sailors who have reserved both a red and green boat. ii) Write a nested query to find the names of sailors who have reserved all boats.	6 Marks	L2	CO3	PO2
	b)	Illustrate PL/SQL control structure with examples.	6 Marks	L2	CO3	PO2
		UNIT-IV				
7.		Compare and contrast BCNF with 3NF.	12 Marks	L4	CO4	PO3
		(OR)				
8.	a)	Illustrate multi-valued dependencies and Fourth normal form with example.	6 Marks	L3	CO4	PO3
	b)	Discuss serializability in detail.	6 Marks	L2	CO4	PO2
		UNIT-V				
9.	a)	Discuss in detail Multiple Granularity.	6 Marks	L2	CO5	PO2
	b)	Demonstrate searching a given element in B+ trees. Explain with example.	6 Marks	L2	CO5	PO2
		(OR)				
10.	a)	Describe Validation-based locking protocols.	6 Marks	L2	CO5	PO2
	b)	Illustrate insertion of an element in B+ trees with example.	6 Marks	L3	CO5	PO3

❀ ❀ ❀

CODE No.: 19BT41001 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

INDUSTRIAL INSTRUMENTATION

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What is the need for viscosity measurement in industries? List some applications, safety issues that may arise due to improper selection of sensor in an industrial environment. Suggest one method of viscosity measurement and explain it.	6 Marks	L3	CO1	PO4
	b)	Describe the construction and working principle Searle's rotating cylinder.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	List the types of humidity. Explain the construction and working principle of Psychrometer with a neat sketch.	6 Marks	L2	CO1	PO1
	b)	Define specific viscosity. Explain the construction and working principle of friction tube viscometer.	6 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Identify an appropriate sensing mechanism for measurement low pressure. Justify your sensor selection and explain how this works with a neat sketch.	6 Marks	L3	CO1	PO4
	b)	What is Absolute pressure? With a neat sketch explain Thermal conductivity Gage.	6 Marks	L1	CO1	PO1
		(OR)				
4.	a)	Differentiate the working principle of McLeod Gage and Ionization gage.	6 Marks	L3	CO1	PO2
	b)	Analyze different types of pressure and give 3 different units of the quantity they measure.	6 Marks	L2	CO2	PO2

UNIT-III

5.	a)	Select a suitable level measurement device for to measure the level of high conductive liquid with suitable explanation.	6 Marks	L1	CO2	PO4
	b)	Measurement of Level could be done based on differential pressure. Explain the construction, working principle of level measurement based on differential pressure.	6 Marks	L1	CO2	PO1
		(OR)				
6.	a)	Design a level sensing mechanism to measure level of a tank with the following requirements using resistive technique. Resolution of 1 cm. Range of 10 cm. Diameter of the tank is 10 cm with clean liquid. Draw a suitable diagram to represent the design and signal conditioning circuit for given specifications.	6 Marks	L3	CO2	PO4
	b)	Compare and differentiate the operation of various electric types of level measurement techniques.	6 Marks	L3	CO2	PO2

UNIT-IV

7.	a)	Select a suitable flow measuring device which is vertically installed and explain its working principle of hot wire anemometer with suitable diagram.	6 Marks	L2	CO2	PO4
	b)	Give the types of Flow. Sketch the construction and elaborate the working principle of Liquid bridge mass flow meter.	6 Marks	L1	CO2	PO1
		(OR)				
8.	a)	List different Flow sensing mechanisms. Present an analysis of different mechanisms, their merits and demerits.	6 Marks	L2	CO2	PO4
	b)	Show how a Hotwire anemometer and EM flow meter could be used for measurement of flow rate using a neat sketch and appropriate representation.	6 Marks	L2	CO2	PO4

UNIT-V

9.	a)	List different proximity sensor types and compare their merits and demerits.	6 Marks	L3	CO4	PO3
	b)	Design a voltage to current converter to convert 0-5 V to 4 to 20mA.	6 Marks	L3	CO3	PO3
		(OR)				
10.	a)	How is a charge amplifier different from electrometer amplifier? Explain the working of charge amplifier with a neat sketch.	6 Marks	L1	CO3	PO1
	b)	Elaborate the safety measure to avoid hazardous conditions in industries.	6 Marks	L3	CO4	PO6

CODE No.: 19BT50201 SVEC-19

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

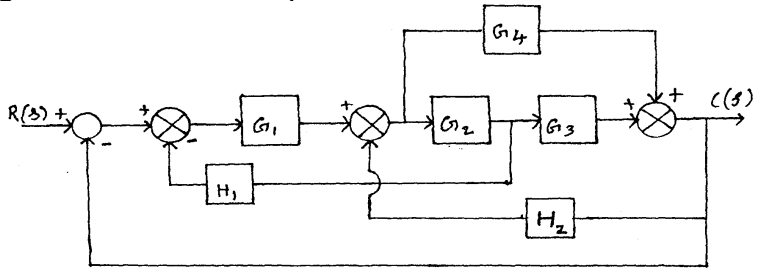
CONTROL SYSTEMS
[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

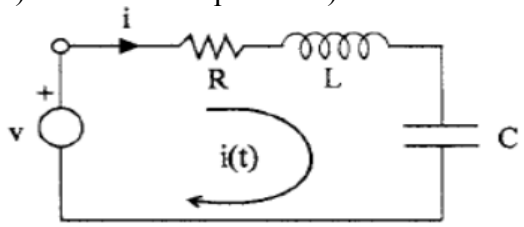
UNIT-I

1.	a)	Derive an expression for the transfer function of an Armature controlled DC motor.	6 Marks	L3	CO1	PO1
	b)	Obtain transfer function for the given system using block diagram reduction techniques.	6 Marks	L3	CO1	PO5



(OR)

2.	a)	Define transfer function and enumerate its advantages and disadvantages.	4 Marks	L2	CO1	PO1
	b)	Obtain the relation between the applied voltage and the current in the form of i) Differential equation ii) Transfer function.	8 Marks	L3	CO1	PO2



UNIT-II

3.	a)	Derive the expression for steady state error and obtain its static error constants k_p, k_v and k_a.	6 Marks	L2	CO2	PO1
	b)	For a system whose transfer function is $G(S)=\frac{1}{S(S+1)}$, the input to the system is described by $r(t)=4+6t+2t^2$. Find the generalized error coefficients and steady state error.	6 Marks	L4	CO2	PO2

(OR)

4.	a)	What is an integral controller and justify how does it improves the dynamics of a control system?	4 Marks	L2	CO2	PO7
	b)	Determine the nature of the closed-loop system for a unit-step input from open loop transfer function of unity feedback system given by $G(S)=\frac{8}{S(S+1)}$. Also determine rise time, peak time and peak overshoot.	8 Marks	L2	CO2	PO2

UNIT-III

5.	a)	Draw the Nyquist plot for the system whose open loop transfer function is $G(S)H(S) = \frac{K}{S(S+2)(S+10)}$. Determine the range of 'K' for which closed loop system is stable.	6 Marks	L2	CO3	PO2
	b)	Determine the range of K for which the system represented by the characteristic equation $S^2 + KS + 2K - 1 = 0$ Sis stable.	6 Marks	L2	CO3	PO4

(OR)

6.		Sketch the Bode plots showing the magnitude in dB and phase angle in degrees as a function of log frequency for the transfer function $G(S)H(S) = \frac{KS^2}{(1+0.2S)(1+0.02S)}$. Determine the system gain *K* for the gain cross over frequency to be 5 rad/sec.	12 Marks	L2	CO3	PO4

UNIT-IV

7.		A Unity feedback system has an open loop transfer function $G(S) = \frac{K}{S(1+2S)}$. Design a lag compensator so that the phase margin is 40° and the steady state error for ramp input is less than or equal to 0.2.	12 Marks	L4	CO4	PO3

(OR)

8.		Consider the unity feedback system whose open loop transfer function is $G(s)H(s) = \frac{K}{S(S+3)(S+6)}$. Design a suitable compensator to meet the following specifications i) Velocity error constant, $K_v = 80$ and ii) Phase margin=35^0.	12 Marks	L4	CO4	PO3

UNIT-V

9.		Test the controllability and observability of a system described by $\begin{bmatrix} \dot{X}_1 \\ \dot{X}_2 \\ \dot{X}_3 \end{bmatrix} = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -160 & -56 & -14 \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \\ X_3 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \\ -14 \end{bmatrix} u, \quad y = \begin{bmatrix} 1 & 0 & 0 \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \\ X_3 \end{bmatrix}$	12 Marks	L4	CO5	PO4

(OR)

10.	a)	State the properties of state transition matrix and its significance.	6 Marks	L2	CO5	PO1
	b)	Find the state transitions matrix of the following system $\dot{X} = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -2 & -5 & -4 \end{bmatrix} X.$	6 Marks	L3	CO5	PO2

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations December - 2022

PRINCIPLES OF COMMUNICATION

[ELECTRONICS AND INSTRUMENTATION ENGINEERING]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Find the Fourier transform of unit impulse, unit step and ramp signals. Draw the corresponding Fourier spectrum.	7 Marks
	b)	A signal $m(t)$ is multiplied with $\cos w_0 t$. Determine the Fourier Transform of the resulting signal.	7 Marks
		(OR)	
2	a)	Define the Cross Correlation function. Explain about its properties.	7 Marks
	b)	Explain the necessity of communication. Explain about convolution of signals.	7 Marks

UNIT-II

3	a)	Explain the principle of V.S.B Transmission. What are its advantages over S.S.B?	7 Marks
	b)	The antenna current of an AM transmitter is 9A when only carrier is transmitted but it increases to 10.6A when the carrier is modulated by a single sine wave. Find the percentage of modulation. Determine the antenna current when the percentage of modulation changes to 0.8.	7 Marks
		(OR)	
4	a)	With necessary equations. Explain the generation of N.B.F.M using narrow band P.M generator.	7 Marks
	b)	Explain the comparisons between FM and AM techniques.	7 Marks

UNIT-III

5	a)	The spectral range of a function extends from 10.0 MHz. Find the minimum sampling rate, the maximum sampling time.	9 Marks
	b)	Discuss about the generation of PPM.	5 Marks
		(OR)	
6	a)	Distinguish FDM & TDM. What do you mean by asynchronous multiplexing?	5 Marks
	b)	What is PWM? What other names does it have? With the help of a circuit diagram explain PWM demodulation and explain its operation.	9 Marks

UNIT-IV

7	a)	Draw the block diagram of PCM generator and explain each block.	8 Marks
	b)	Explain the operation of FSK modulator.	6 Marks
		(OR)	
8	a)	Discuss the effect of noise in Delta modulation	8 Marks
	b)	Distinguish among PSK, DPSK and QPSK.	6 Marks

UNIT-V

9	a)	Define mutual information. State and prove the properties of it..	7 Marks
	b)	Explain the concept of Huffman coding technique by taking an example.	7 Marks
		(OR)	
10	a)	Explain the concept of error detection and correction using hamming codes.	7 Marks
	b)	Explain about code tree, trellis and state diagrams for a convolutional encoder.	7 Marks

❀ ❀ ❀

CODE No.: 16BT40502 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

DATA BASE MANAGEMENT SYSTEMS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discriminate relationships and relationship sets.	CO2	7 Marks
	b)	Describe in detail about the Database Architecture.	CO1	7 Marks
		(OR)		
2.	a)	Define Database? Write the applications of Database Systems in detail.	CO1	7 Marks
	b)	Illustrate in detail how to translate an ER diagram into a collection of tables with associated constraints.	CO4	7 Marks

UNIT-II

3.	a)	Discuss about relational algebra with suitable example.	CO1	7 Marks
	b)	Describe about the logical database design.	CO1	7 Marks
		(OR)		
4.	a)	Consider the following database. Employee (employee-name, street, city) Works (employee-name, company-name, salary) Company (company-name, city) Manager (employee-name, manager-name) Give an expression in the relational algebra, the tuple relational calculus, and the domain relational calculus, for the following query. Find the names of all employees who work for estate bank	CO4	7 Marks
	b)	Illustrate different set operations in relational algebra with examples.	CO1	7 Marks

UNIT-III

5.	a)	Demonstrate logical connectives of SQL with example.	CO1	7 Marks
	b)	Compare and contrast BCNF with 3NF.	CO2	7 Marks
		(OR)		
6.	a)	Enumerate Multi valued dependencies and Fourth normal form with examples.	CO1	7 Marks
	b)	Explain about the following classes with an example. i) Group by; ii) Order by.	CO5	7 Marks

UNIT-IV

7.	a)	Differentiate two phase locking protocol and strict two phase locking protocol.	CO2	7 Marks
	b)	Describe Timestamp based locking protocol.	CO1	7 Marks
		(OR)		
8.	a)	Write short notes about the following: i) serializable schedule ii) recoverable schedule iii) strict schedule	CO1	7 Marks
	b)	Identify the use of log in transaction roll back and crash recovery.	CO2	7 Marks

UNIT-V

9.	a)	Demonstrate searching a given element in B+ trees? Explain with an example?	CO3	7 Marks
	b)	Write the differences between Primary versus secondary indexes.	CO2	7 Marks
		(OR)		
10.	a)	Apply the concept of B+ tree for implementation of an indexed sequential file.	CO4	7 Marks
	b)	Show the method to reduce access time with primary index by considering example.	CO3	7 Marks

CODE No.: 16BT60101 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

FOUNDATION ENGINEERING
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Briefly explain with neat sketch Standard Penetration Test and the corrections to be applied to find 'N' value.	CO1	4 Marks
	b)	Compute the area ratio of a thin walled tube samples having an external diameter of 60 cm and wall thickness of 2.25 mm. Do you recommend the sampler for obtaining un-disturbed soil samples?	CO2	10 Marks
		(OR)		
2.	a)	Discuss various types of soil samplers for obtaining undisturbed samples.	CO1	6 Marks
	b)	What are the methods of soil exploration? Describe briefly Geo-Physical methods of sub-surface exploration.	CO1	8 Marks

UNIT-II

3.		A gravity retaining wall retains 9 m of a backfill, unit weight of soil=19kN/m^3, angle of shearing resistance = 30º with a horizontal surface. Assume the wall interface to be vertical, determine ; (i) the magnitude and point of application of the total active pressure ii) if the water table is at a height of 4 m, and how far do the magnitude and the point of application of active pressure changed. Take submerged unit weight = 10 kN/m^3.	CO2	14 Marks
		(OR)		
4.		Explain in detail the main design considerations for retaining walls and check for stability.	CO1	14 Marks

UNIT-III

5.	a)	Explain the Bishop's method of analysis for stability of slopes.	CO2	6 Marks
	b)	A cutting 8 m deep is to be made in a saturated clay soil with γ = 20 kN/m3, Cu = 20 kN/m2 and φ = 0º. A hard stratum exists at a depth of 12 m below the ground level. Determine the angle of the slope at which failure would occur.	CO2	8 Marks
		(OR)		
6.	a)	Write short notes on: i) Taylor's stability number; ii) Types of slope failure.	CO2	6 Marks
	b)	The average height of a 2.0m wide earth slice is 20m. The properties of soil are: c′=23 kPa, φ'= 30°, γ= 17 kN/m^3. The water table is located at a depth of 4.0m below the surface along the centre line of slice. The bottom of the slice is inclined at 30° to horizontal. Calculate the safety factor against sliding using effective stress analysis.	CO2	8 Marks

UNIT-IV

7.	a)	Derive Terzaghi's bearing capacity equation.	CO2	7 Marks
	b)	A square footing is resting on stiff saturated clay with unconfined compression strength of 200 kN/m². The depth of foundation is 2 m. Determine the size of the footing if the column load is 700 kN. Assume a factor of safety as 2.5. The bulk unit weight of soil is 20kN/m^3. What will be the change in ultimate, net ultimate and safe bearing capacity if the water table is at ground level?	CO2	7 Marks

(OR)

8.	a)	Explain various types of shear failures in soil with neat sketch.	CO1	6 Marks
	b)	A footing 6 m x 4 m in plan, transmits a pressure of 150 kN/m^2 on a cohesive soil having E = 6 x 104 kN/m² andμ = 0.50. Determine the immediate settlement at the centre, assuming it to be (a) flexible footing and (b) a rigid footing.	CO2	8 Marks

UNIT-V

9.	a)	Briefly explain dynamic formulae of load carrying capacity of piles.	CO1	5 Marks
	b)	Determine the group capacity of 15 piles arranged in 3 rows of diameter 300 mm. If the piles are driven 8 m in to clay with cohesion 25 kN/m^2. Take spacing of piles as 0.8 m. (ii) Discuss the method of obtaining ultimate load and also allowable load on a single pile from pile load test.	CO3	9 Marks

(OR)

10.	a)	What are the different shapes of foundation wells and what are their comparative merits and demerits.	CO1	6 Marks
	b)	What are the various components of well foundation and discuss them in detail.	CO1	8 Marks

CODE No.: 16BT60102 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

HIGHWAY AND TRAFFIC ENGINEERING
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Write some brief notes on: i) Central Road Fund ii) Indian Roads Congress iii) Motor vehicle act.	CO1	7 Marks
	b)	Illustrate with neat sketch about the obligatory points controlling highway alignment.	CO8	7 Marks
		(OR)		
2.	a)	A National Highway passing through rolling terrain of heavy rainfall area, R=500m. Assume suitable data and design the length of Transition curve.	CO3	7 Marks
	b)	The speed of overtaking and over taken vehicles are 80 and 50 Kmph respectively on a two way traffic road. If the acceleration of overtaking vehicle is 1.2 m/s^2 calculate SSD, OSD.	CO2	7 Marks

UNIT-II

3.		Explain any four laboratory tests on aggregates and write its inferences.	CO5	14 Marks
		(OR)		
4.	a)	Examine the design consideration for spacing of expansion and contraction joints.	CO1	7 Marks
	b)	Describe in detail about the IRC method of flexible pavement design. Discuss the limitation of this method.	CO6	7 Marks

UNIT-III

5.	a)	Classify the various methods used to measure the skid resistance? Explain it briefly.	CO1	7 Marks
	b)	List out the various road user characteristics with Indian Road Congress (IRC).	CO7	7 Marks
		(OR)		
6.	a)	What are the different types of resistance that is offered by the vehicle when it is in motion? Explain.	CO1	7 Marks
	b)	What are the various vehicle characteristics which affect the road design and traffic performance?	CO2	7 Marks

UNIT-IV

7.	a)	What are the various traffic studies in traffic engineering? Draw its flow chart.	CO8	7 Marks
	b)	Discuss the factors on which PCU values depend?	CO1	7 Marks
		(OR)		
8.	a)	What is the significance of road user characteristics in traffic engineering? Discuss briefly the various factors which affect the road user characteristics and their effects in traffic performance.	CO2	7 Marks
	b)	Discuss the various traffic studies and their importance.	CO1	7 Marks

UNIT-V

9.	a)	What is an intersection? Explain in detail, the two broad classifications of intersections.	CO1	7 Marks
	b)	What are the various aspects investigated during parking studies. what are the uses of these studies	CO4	7 Marks

(OR)

10.		What are the various types of traffic islands used? Explain the uses of each with neat sketches show few typical patterns of channelized intersections. What are the advantages and limitations of channelized intersections.	CO2	14 Marks

CODE No.: 16BT60103 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

STEEL STRUCTURES
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Design a single bolted double cover butt joint to connect boiler plates of thickness 12 mm for maximum efficiency. Use M16 bolts of grade 4.6. Boiler plates are of Fe410 grade. Find the efficiency of the joint.	CO3	14 Marks

(OR)

2.	a)	List some common defects associated with welds.	CO1	3 Marks
	b)	Under what circumstances are slot and Plug welds used	CO1	4 Marks
	c)	Calculate the design strength of welded joint. If the size of weld is 6 mm and its length is 240 mm, the ultimate shear stress in the weld is 410 Mpa. Assume the conditions are made in workshop.	CO3	7 Marks

UNIT-II

3.		A simply supported beam ISMB 400 @ 616 N/m is subjected to a bending moment of 100 kN-m and shear force 80 kN. Check the safety of the beam in shear and deflection.	CO6	14 Marks

(OR)

4.		An ISMB 500 @ 869 N/m carries a UDL over an effective span of 6.5m, if the beam is restrained laterally. What UDL the beam can carry. Fy is 250 Mpa.	CO3	14 Marks

UNIT-III

5.		Determine the design compressive strength of single ISLB 450 @ 653 N/m when it is used as column of effective length 4 m. The yield stress of steel is 300 N/mm^2.	CO2	14 Marks

(OR)

6.		Design a single angle tension member to carry a tensile force of 225 kN. The angle is to be connected to a gusset plate by one of its leg by fillet welds. fy is 250 N/mm^2, fu is 410 N/mm^2.	CO3	14 Marks

UNIT-IV

7.		With the help of IS code, design a battened column with two channels back to back length 10 m to carry an axial factored load of 1400 kN. The column may be assumed to have restrained in position but not in direction at both ends.	CO7	14 Marks

(OR)

8.		Design a laced column with two channels back to back length 12 m to carry an axial factored load of 1600 kN. The column may be assumed to have restrained in position but not in direction at both ends.	CO3	14 Marks

UNIT-V

9.		Determine the design loads on the purlins of an industrial building near Visakhapatnam, given Class of building: General with life 50 years, Terrain: Category 2, Maximum dimension: 40 m Width of building: 15 m Height at eve level : 8 m Topography : θ less than 3 deg.	CO2	14 Marks

(OR)

10.	a)	State the different truss configurations that are often used in practice.	CO1	5 Marks
	b)	List the various steps involved in the design of truss members.	CO6	9 Marks

CODE No.: 16BT60110 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

SOLID WASTE MANAGEMENT
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Describe the methods of sampling and characterization of solid waste.	CO2	7 Marks
	b)	Explain the functional elements of solid waste management with neat sketch.	CO1	7 Marks
		(OR)		
2.	a)	Investigate the various approaches to be followed for effective solid waste management.	CO4	7 Marks
	b)	Write a detailed note on solid waste sources in urban Centers.	CO1	7 Marks

UNIT-II

3.		Explain on-site processing techniques of solid waste in commercial and industrial facilities.	CO5	14 Marks
		(OR)		
4.		Discuss various acts, rules and legislations related to solid waste management in India.	CO8	14 Marks

UNIT-III

5.		Describe in detail the methods of collection system with flow diagram and types of vehicles used in collection system.	CO4	14 Marks
		(OR)		
6.		Discuss the types of transfer stations and the benefits of transfer stations that affect community in terms of economics, time savings and environmental quality.	CO7	14 Marks

UNIT-IV

7.	a)	Explain briefly about various magnetic separators with neat sketches.	CO9	7 Marks
	b)	Write short notes on pyrolysis of solid waste.	CO1	7 Marks
		(OR)		
8.	a)	Discuss the factors to be considered for the design of aerobic composting.	CO3	7 Marks
	b)	Write short notes on Shredding and pulverizing.	CO1	7 Marks

UNIT-V

9.	a)	Explain the adverse effects of a landfill leachate and appropriate control measures.	CO6	7 Marks
	b)	Enumerate step by step procedure involved in site selection for sanitary landfills.	CO1	7 Marks
		(OR)		
10.		Enumerate briefly about Bio-medical waste management.	CO1	14 Marks

CODE No.: 16BT60118 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

RURAL TECHNOLOGY

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	A small voluntary association of poor people gathered and formed a group called self-help group. State the nature and various features of self-help group.	CO1	7 Marks
	b)	Kuntala is a village which is under developed without using any government schemes. Apply some of the schemes to develop the village under rural development.	CO2	7 Marks
		(OR)		
2.	a)	Srinivas was elected as panchayat president of Itepalli. He called all the villagers and explained about the roles and responsibilities of Panchayat raj institutions. What he explained to villagers.	CO1	7 Marks
	b)	Murthy is a young post graduate in Rural Management studied from Delhi University. Later he got appointment in NABARD. One day he visited a small village in Chittoor District. He observed that the village was not developed and he wants to implement the schemes proposed by NABARD and how he can educate the rural people about NABARD.	CO1	7 Marks

UNIT-II

3.	a)	Analyze the process of composting and Vermi-composting.	CO2	7 Marks
	b)	Arjun from a poor village background went to town to study in electrical engineering in a university where he got a free seat. After completing graduation, he wants to develop his village regarding power through non-conventional energy resources. What are the different types of energies he can use? Explain any two in detail.	CO1	7 Marks
		(OR)		
4.		Differentiate between renewable and non-renewable energy resources. Write the working procedure about trough system and power towers in concentrated solar power and photovoltaics to generate electricity.	CO1	14 Marks

UNIT-III

5.	a)	Rayalaseema region is a drought prone area with many dry lands. Due this condition, the rare species will become extinct in future and need to improve the situation. In this regard government decided to setup industry to implement tissue culture in the area. Explain the techniques involved in doing the process.	CO4	7 Marks
	b)	Which crops are called Economic plants? What are the advantages of cultivating of economic plants?	CO1	7 Marks
		(OR)		
6.		What is meant by cottage industry? How employment generation is	CO4	14 Marks

possible with the cottage industry.

UNIT-IV

7.	a)	Educate the rural people about the manufacturing process of bio fertilizers.	CO6	7 Marks
	b)	Nandipalli village people are suffering with quality less water problem. Explain basic water purification methods suitable in rural areas.	CO5	7 Marks
		(OR)		
8.	a)	Raju is living in the coastal area and wish to carryout fish farming both in salt and fresh water. Suggest the existing practices for the fish farming.	CO2	7 Marks
	b)	Chinnakunta village is facing water scarcity problems. How the problem can be solved through different rain water harvesting techniques.	CO1	7 Marks

UNIT-V

9.		List ICT applications in rural areas and explain in detail.	CO2	14 Marks
		(OR)		
10.	a)	Explain the need and necessity of technology in rural development. How it can be achieved with private partnership under SAGY.	CO3	7 Marks
	b)	How do you understand the impact of environmental parameters and pollution on human health?	CO6	7 Marks

CODE No.: 16BT60302 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

HEAT TRANSFER
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Derive the general heat conduction equation in spherical coordinates.	CO2	14 Marks

(OR)

2.	a)	Define Critical thickness of insulation. Obtain an expression for critical radius of insulation for a cylindrical shell.	CO1	7 Marks
	b)	The door of a cold storage plant is made from two 6mm thick glass sheets separated by a uniform air gap of 2mm. The temperature of the air inside the roo m is -20^{0}C and the ambient air temperature is 30^{0}C. Assuming the heat transfer coefficient between glass and air to be 23.26 W/m^2 K, determine the rate of heat leaking into the room per unit area of the door. Neglect convection effects in the air gap. K_{glass} = 0.75 W/m K; K_{air} = 0.02 W/m K.	CO5	7 Marks

UNIT-II

3.	a)	Define Efficiency and Effectiveness of Fin.	CO2	2 Marks
	b)	A steel rod (K= 32 W/m^{0}C), 12mm in diameter and 60mm long, with an insulated end, is to be used as a spine. It is exposed to surroundings with a temperature of 60^{0}C and a heat transfer coefficient of 55 W/m^2 ^{0}C. The temperature at the base of fin is 95^{0}C. Determine: i) The heat dissipation ii) The temperature at the edge of the fin iii) The fin efficiency.	CO5	12 Marks

(OR)

4.	a)	What is Lumped Heat analysis? Derive an expression for its temperature distribution.	CO2	7 Marks
	b)	On a hot summer's day a concrete highway may reach a temperature of 55^{0}C. Suppose that a stream of water is directed on the highway so that the surface temperature is suddenly lowered at 35^{0}C. How long it will take to cool the concrete to 45^{0}C at a depth of 5cm from the surface? For concrete, K= 1.279 W/m K, œ=1.77 X 10^{-3}m^2/hr.	CO5	7 Marks

UNIT-III

5.	a)	What is the boundary layer thickness? What do you mean by laminar and turbulent boundary layers? What is laminar sublayer?	CO1	7 Marks
	b)	A horizontal fluorescent tube which is 3.8 cm in diameter and 120 cm long stands in still air at 1 atm. and 20^{o}C. If the surface temperature of the tube is 40^{o}C and radiation is neglected, what percentage of power is being dissipated by convection? Take properties of air as v = 16.19 X 10^{-6} m^2/sec., K air = 0.02652 W/m K, Pr = 0.706, p = 1.02 kg/m^3, Cp = 1.004 kJ/kg K .	CO2	7 Marks

(OR)

6.		A rectangular plate is 120 cm long in the direction of flow and 200 cm wide. The plate is maintained at 80^0C when placed in nitrogen that has a velocity of 2.5 m/s and a temperature of 0^0C. Determine: i) the average friction coefficient, ii) the viscous drag exerted on the plate, iii) the average heat transfer coefficient and iv) the total heat transfer rate from the plate.	CO2	14 Marks

UNIT-IV

7.		Hot gases enter a finned tube heat exchanger at 300 and leave at 100. It is used to heat water at a flow rate of 1 kg/s from 35 to 125^0C. The specific heat of exhaust hot gas is 1000 J/kgK and the overall heat transfer coefficient based on the gas side is U_h = 100 W/m^{2}K. Determine the required gas surface area using the NTU method.	CO5	14 Marks

(OR)

8.		A 4cm outer diameter, 1 m long tube is to be used to condense steam at atmospheric pressure. The water flows inside the tube maintaining the wall surface at 60^0C. Estimate the mass of condensate for the tube in horizontal position.	CO2	14 Marks

UNIT-V

9.	a)	Derive an expression for radiation heat exchange between two large parallel planes.	CO2	7 Marks
	b)	Emissivities of two large parallel plates maintained at 850^0C and 350^0C are 0.35 and 0.55 respectively. Find the percentage reduction in heat transfer when a polished aluminum radiation shield of emissivity 0.05 is placed between them. Also find the temperature of the shield.	CO3	7 Marks

(OR)

10.	a)	What is radiation shape factor and Plank's distribution law.	CO1	6 Marks
	b)	Two parallel plates 0.5 by 1.0 m are spaced 0.5 m apart. One plate is maintained at 1000 ^{0}C and the other at 500 ^{0}C. The emissivities of the plates are 0.2 and 0.5, respectively. The plates are located in a very large room, the walls of which are maintained at 30^0C. The plates exchange heat with each other and with the room, but only the plate surfaces facing each other are to be considered in the analysis. Find the net heat transfer to each plate and to the room.	CO2	8 Marks

CODE No.: 16BT60304 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

GAS TURBINES AND JET PROPULSION
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Point out the applications of Gas turbine power plants.	CO1	4 Marks
	b)	The Pressure ratio of an Open cycle gas turbine power plant is 5.6.Air is taken at 30^0C and 1 bar. The compression is carried out in two stages with perfect intercooling in between. The maximum temperature of the cycle is limited to 700^0C.Assuming the isentropic efficiency of each stage compressor is 85% and Turbine is 95%.Estimate the power developed and efficiency of the power plant, if the air flow is 1.2 kg/sec. Mass of the fuel may be neglected, and may be assumed that Cp=1.02 kJ/kg K and gamma=1.41 & Illustrate its TS Chart and process.	CO2	10 Marks

(OR)

2.	a)	Point out the effect of pressure ratio on the performance of gas turbine?	CO1	4 Marks
	b)	Ina gas turbine plant working on Brayton cycle, the air at inlet is 27°c, 0.1 MPa. The pressure ratio is 6.25 and the maximum temperature is 800°C.The turbine and compressor efficiencies are each 80%. Examine the compressor work, turbine work, heat supplied, cycle efficiency and turbine exhaust temperature. Mass of air may be considered as 1Kg. Draw T-S diagram.	CO2	10 Marks

UNIT-II

3.		Following particulars related to centrifugal compressor Is Inlet diameter of impeller is 61.4 cm and outlet diameter of impeller is 123 cm, Speed is 5000rpm n=1.6, FAD = 1000 m^3/min pressure ratio is 1.33. Assuming that pressure rise takes place in the impeller .Find the angle at which air from impeller enter the casing, breadth of the impeller blade inlet and outlet.	CO2	14 Marks

(OR)

4.		A centrifugal compressor running at 7000 rpm delivers 500 m^3/min of free air. The air is compressed from 1 bar and 20 degrees centigrade. To a pressure ratio of 4 with an isentropic efficiency of 0.85. Blades are radial at outlet of impeller and the flow velocity of 60m/s may be assumed constant. The outer radius of the impeller is twice the inner and slip factor may be assumed as 0.9. Calculate the i) Final temperature of air ii) The theoretical power iii) Inner diameter at inlet and outlet iv) Breadth of the impeller at inlet v) Impeller blade angle at inlet vi) Diffuser blade angle at outlet.	CO2	14 Marks

UNIT-III

5.	a)	What are the reasons for uneven temperature distributions in gas turbines? What harm can it cause?	CO3	7 Marks
	b)	What is blowout in gas turbines? When it does it occur?	CO3	7 Marks

(OR)

6.		How stabilization of flame is obtained in a typical gas turbine combustion chamber? Show by a sketch the flow pattern in a typical combustion chamber.	CO3	14 Marks

UNIT-IV

7.	a)	Draw the thermodynamic cycle of the ramjet engine and derive the equation for thrust.	CO4	7 Marks
	b)	What are the advantages and disadvantages of a ramjet engine and what are its applications.	CO4	7 Marks

(OR)

8.		Explain the working principle of pulse jet engine with the help of schematic diagram. Mention it advantages and disadvantages.	CO4	14 Marks

UNIT-V

9.	a)	Compare the various rocket propulsion devices.	CO1	7 Marks
	b)	Explain the concept of ion propulsion.	CO5	7 Marks

(OR)

10.	a)	Explain the concept plasma propulsion.	CO5	7 Marks
	b)	Draw a schematic diagram of a liquid propellant rocket and explain its working. What are the applications of this type of rocket?	CO5	7 Marks

CODE No.: 16BT60402 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

DIGITAL SIGNAL PROCESSING
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Using the properties of DTFT, find the frequency domain representation of following signals. i) $\left(\frac{1}{3}\right)^{\lvert n-3\rvert} u(n-3)$; ii) $n3^{-n}u(-n)$	CO5	7 Marks
	b)	Determine the z-transform the signal $x(n) = (-1)^n \cos\left(\frac{n\pi}{3}\right)u(n)$.	CO2	7 Marks

(OR)

2.	a)	Check whether following system is linear, causal and time invariant. $y(n) = x(n)x(n-2)$.	CO2	7 Marks
	b)	Derive the relation between the input and output of LTI system.	CO3	7 Marks

UNIT-II

3.	a)	Develop the DIT FFT algorithm with neat sketch for N = 8.	CO3	8 Marks
	b)	Synthesize the time domain sequence using IDFT of the sequence $x(k)=\{1, 1-2j, -1, 1+2j\}$.	CO5	6 Marks

(OR)

4.	a)	Find the 8-Point DFT of the sequence $x(n)=\{1, -1, -1, -1, 1, 1, 1, -1\}$ using DIT FFT algorithm.	CO5	7 Marks
	b)	Derive the relation between DFT and Z-transform.	CO3	7 Marks

UNIT-III

5.	a)	Apply the bilinear transformation to $H_a(s) = \frac{4}{(s+3)(s+4)}$ with $T = 0.5$s and find $H(z)$.	CO4	7 Marks
	b)	Derive the frequency mapping expression for bilinear transformation.	CO2	7 Marks

(OR)

6.	a)	Synthesize the characteristics of Butterworth prototype filter and give its pole zero locations in Z plane.	CO4	7 Marks
	b)	Obtain the Direct form I and Direct form II realizations of the difference equation $y(n)=b0x(n) + b1x(n-1) + b2x(n-2) - a1y(n-1) - a2y(n-2)$.	CO2	7 Marks

UNIT-IV

7.	a)	Synthesize the Direct form realizations of linear phase FIR filter when N is even and odd.	CO4	7 Marks
	b)	Design Low pass FIR filter for the desired frequency response $H_d(w) = \begin{cases} e^{-j2w} & -\frac{\pi}{4} \le \omega \le \frac{\pi}{4} \\ 0 & \frac{\pi}{4} \le \omega \le \pi \end{cases}$ using Rectangular window when N = 5.	CO3	7 Marks

(OR)

8.	a)	Design a linear phase FIR Lowpass filter using rectangular window with cut off frequency Wc=0.2π rad/sample and N=7.	CO3	7 Marks
	b)	Distinguish advantages and disadvantages of FIR and IIR filters.	CO2	7 Marks

UNIT-V

9.	a)	Write a short note on i) pipelining; ii) Onchip peripherals.	CO1	7 Marks
	b)	Distinguish synchronous and asynchronous mode of operation of serial ports.	CO1	7 Marks

(OR)

10.	a)	Explain Von Neumann and Harvard architecture with a neat sketch	CO1	7 Marks
	b)	Explain the internal architecture of TMS320C6X DSP processor.	CO1	7 Marks

CODE No.: 16BT60406 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

TELECOMMUNICATION SWITCHING SYSTEMS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Memorize the Evolution of telecommunications.	CO1	7 Marks
	b)	Assess the advantages and disadvantages of space division and time division switching systems.	CO2	7 Marks

(OR)

2.	a)	Identify the importance of Cross bar switching and its switch configurations.	CO1	7 Marks
	b)	Distinguish Centralized SPC and distributed SPC and Explain.	CO2	7 Marks

UNIT-II

3.	a)	Categorize the Subscriber loop systems and Interpret in detail. Also identify the importance of transmission plan.	CO1	7 Marks
	b)	Estimate the need of Switching hierarchy and routing and also discuss the environmental issues pertaining to routing.	CO5	7 Marks

(OR)

4.	a)	Explain i) Transmission plan, ii) Numbering plan.	CO1	7 Marks
	b)	Assess the charging plan for telecommunication services.	CO5	7 Marks

UNIT-III

5.	a)	The traffic statistics of a company using a PABX indicates that 180 out-going calls are initiated every hour during working hours. Equal number of calls comes in. Each call lasts for 200 seconds on the average. If the GOS required is 0.05, determine the number of lines required between the PABX and the main exchange.	CO3	7 Marks
	b)	Compare the following Signalling techniques. i) In channel and common channel signalling. ii) In band and out band signalling. iii) Channel associated and channel non associated signalling.	CO4	7 Marks

(OR)

6.	a)	A group of 20 servers carry a traffic control of 10 erlangs. If the average duration of a call is three minutes, calculate the number of calls put through by a single server and the group as a whole in a one hour period.	CO3	7 Marks
	b)	Describe various categories of signalling techniques for a tele-communication system.	CO4	7 Marks

UNIT-IV

7.	a)	List out the various features of ISDN B and D channels.	CO1	6 Marks
	b)	Explain signalling mechanism used in IDSN.	CO5	8 Marks
		(OR)		
8.	a)	List out the features of ATM networks. Explain the principle of operation of ATM switch.	CO1	7 Marks
	b)	Formulate the design goals and basic principles of frame relay.	CO6	7 Marks

UNIT-V

9.	a)	Assess the relationship between STS levels and OC levels.	CO6	7 Marks
	b)	What is the relation between STS and STM and explain.	CO2	7 Marks
		(OR)		
10.	a)	How is STS-I frame organized?	CO6	7 Marks
	b)	How is an STS Multiplexer is different from an add / drop multiplier since both can add signals together?	CO3	7 Marks

CODE No.: 16BT60407 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

DIGITAL CMOS IC DESIGN
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Summarize the charge re-distribution in a clocked gate.	CO1	10 Marks
	b)	Why reverse body biasing important to extend the battery life in the present day context.	CO6	4 Marks
		(OR)		
2.	a)	Explain the clock skew problem in dynamic circuits.	CO1	6 Marks
	b)	Why low power become an important issue in the present day VLSI circuit realization.	CO6	8 Marks

UNIT-II

3.	a)	Identify and design different contact cuts used in NMOS circuits.	CO3	7 Marks
	b)	Evaluate the functionality of Event driven simulator in view of an XOR gate verification.	CO4	7 Marks
		(OR)		
4.	a)	Build the layout of two input NAND gate.	CO3	7 Marks
	b)	Recommend the CMOS design rule for wire and Transistor.	CO4	7 Marks

UNIT-III

5.	a)	Explain Leakage current in DRAM with suitable diagram.	CO1	7 Marks
	b)	Construct NOR Flash memory structure.	CO3	7 Marks
		(OR)		
6.	a)	Explain basic memory architecture with neat sketch.	CO1	7 Marks
	b)	Design 1 bit basic RAM binary cell and explain its read and write operation.	CO3	7 Marks

UNIT-IV

7.	a)	Suggest methods to overcome RC delay.	CO5	6 Marks
	b)	Outline the design techniques to address L(di/dt) Problem.	CO6	8 Marks
		(OR)		
8.	a)	Suggest a design technique for circuit fabrics with predictable wire delay.	CO5	7 Marks
	b)	Assess the challenges for designing reliable output and input pads.	CO6	7 Marks

UNIT-V

9.	a)	Write short notes on Documentation of design process.	CO1	6 Marks
	b)	List the domains in IC development and classify the levels of abstraction.	CO2	8 Marks
		(OR)		
10.	a)	Outline gate array design with neat sketches.	CO1	7 Marks
	b)	Categorize design methods and describe in detail about them.	CO2	7 Marks

CODE No.: 16BT60408 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

INFORMATION THEORY AND CODING
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Write a short note on: i) Kraft's inequality ii) Markov sources and iii) Optimal codes.	CO1	14 Marks
		(OR)		
2.	a)	Explain and derive the expression for differential and conditional differential entropy.	CO2	7 Marks
	b)	Prove that: i) $H(x, y) = H(x) + H(Y)$ ii) $I(x, y) = H(x) + H(y) - H(x, y)$	CO2	7 Marks

UNIT-II

3.		Derive Shannon's second theorem.	CO2	14 Marks
		(OR)		
4.	a)	Evaluate the relation between mutual information and joint entropy.	CO2	7 Marks
	b)	Derive the channel capacity of parallel Gaussian channel.	CO2	7 Marks

UNIT-III

5.	a)	Discuss the generator matrix for linear block codes.	CO5	7 Marks
	b)	Generator matrix of a (7,4) block code is $G = \begin{bmatrix} 1 & 0 & 0 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 0 & 1 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & 1 \end{bmatrix}$ i) Determine the Parity - Check matrix. ii) Determine the maximum weight of the code.	CO4	7 Marks
		(OR)		
6.		The parity check bits of a (8, 4) block code are generated by $c5 = d1+d2+d4$, $c6 = d1+d2+d3$, $c7 = d1+d3+d4$, $c8 = d2+d3+d4$, where $d1$, $d2$, $d3$, $d4$ are message bits. Develop the generator matrix and parity check matrix for this code; i) Identify the minimum weight of this code ii) Compute the error detecting capabilities of this code.	CO4	14 Marks

UNIT-IV

7.	a)	Explain the Viterbi algorithm with an example.	CO6	8 Marks
	b)	Describe clearly the characteristics of BCH code.	CO1	6 Marks

(OR)

8.	a)	Discuss some of Practical applications of Convolution codes.	CO6	6 Marks
	b)	Derive an encoder and decoder for the (15, 11) cyclic Hamming code generated by $g(x) = 1 + x + x4$. Also explain the properties of syndrome polynomial.	CO2	8 Marks

UNIT-V

9.		Design a (7, 3) RS decoder for a receiving vector is R=10000110111110101101111.	CO3	14 Marks

(OR)

10.		With an example discuss about feedback decoder.	CO1	14 Marks

CODE No.: 16BT60409 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

LIGHT WAVE COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks

UNIT-I

1.	a)	Appraise the requirements to be satisfied while selecting the Fiber Materials. Also suggest the materials.	CO6	7 Marks
	b)	Identify and illustrate the appropriate optical fibers for long and short distance communication.	CO5	7 Marks
		(OR)		
2.	a)	Justify how the Optical Fiber Communications are advantageous over conventional communication.	CO6	7 Marks
	b)	Assess the different modes in cylindrical fibers.	CO5	7 Marks

UNIT-II

3.	a)	List and Explain various mechanisms that cause absorption losses in optical fibers.	CO1	8 Marks
	b)	Distinguish between macro bending and micro bending losses in optical fibers.	CO2	6 Marks
		(OR)		
4.	a)	Discuss in detail about the Waveguide and Material Dispersions.	CO1	7 Marks
	b)	Assess the Core & Cladding losses of Optical Fibers.	CO2	7 Marks

UNIT-III

5.	a)	Develop an expression for the density of photons resulting from stimulated and spontaneous emissions in Laser diode.	CO3	7 Marks
	b)	The Radiative and Nonradiative recombination lifetimes of the minority carriers in the active region of a double hetero junction LED are 60ns and 100ns respectively. Determine the total carrier recombination life time and the power internally generated within the device when the peak emission wavelength is 0.87 μm at a drive current of 4mA.	CO4	7 Marks
		(OR)		
6.	a)	Develop the diagram and explain the operation of an edge-emitting double-hetero-junction LED.	CO3	7 Marks
	b)	Derive the expressions for internal quantum efficiency and optical power generated internally in LED.	CO2	7 Marks

UNIT-IV

7.	a)	List and describe different types of mechanical misalignment between two joined fibers.	CO1	7 Marks
	b)	Distinguish Splices and Connectors.	CO2	7 Marks
		(OR)		
8.	a)	Discuss about Lensing Schemes for Coupling Improvement.	CO1	6 Marks
	b)	Consider an LED having a circular emitting area of radius 35μm and a lambertian emission pattern with 150W/(cm^2.sr) axial radiance at a given drive current. Compare the optical powers coupled into two step index fibers, one of which has a core radius of 25μm with NA = 0.20 and the other which has a core radius of 50μm with numerical aperture = 0.2.	CO6	8 Marks

UNIT-V

9.	a)	A 1550nm single mode digital fiber optic link needs to operate at 565 Mb/s over 50km without repeaters. A single mode InGaAsP laser launches an average optical power of -13dBm into the fiber. The fiber has a loss of 0.35dB/km, and there is a splice with a loss of 0.1dB every kilometer. The coupling loss at the receiver is o.5dB, and the receiver uses an InGaAs APD with a sensitivity of -30dbm. Excess noise penalties are predicted to be 1.5dB. Set up an optical power budget for this link and find the system margin.	CO6	7 Marks
	b)	For a multimode fiber link the following parameters are recorded i) LED with drive circuit has rise time of 15ns ii) LED Spectral width =40nm iii) Material Dispersion related rise time degradation =21ns over 6km link. iv) Receiver Bandwidth = 25MHz. v) Modal Dispersion Rise Time = 3.9nSec. Calculate the system Rise Time.	CO4	7 Marks

(OR)

10.	a)	Model Ethernet in Optical Networks.	CO5	7 Marks
	b)	Sketch the optical power loss model for a point-to-point link and mention the various losses that occur at connectors and splices.	CO4	7 Marks

CODE No.: 16BT60501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

SOFTWARE TESTING
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss software testing Myths and Facts.	CO1	7 Marks
	b)	Define psychology for software Testing and Explain?	CO1	7 Marks
		(OR)		
2.	a)	Draw the life cycle of Bugs.	CO2	8 Marks
	b)	Explain bug classification based on SDLC?	CO1	6 Marks

UNIT-II

3.	a)	Explain basic path testing.	CO1	7 Marks
	b)	How do you calculate the number of decision nodes foe switch-case?	CO1	7 Marks
		(OR)		
4.	a)	Explain different data-flow anomalies.	CO1	6 Marks
	b)	Explain Dynamic data flow testing.	CO1	8 Marks

UNIT-III

5.	a)	What is boundary value analysis? Discuss the need for boundary value analysis.	CO1	7 Marks
	b)	Design test cases using Boundary value analysis for the given problem. "A program reads an integer number within the range [1,100] and determines whether it is prime or not"	CO3	7 Marks
		(OR)		
6.	a)	Discuss the steps involved in equivalence class partitioning.	CO1	7 Marks
	b)	Apply equivalence class testing technique and design suitable test cases for the following requirement. "A program reads three numbers A, B and C, with a range [1, 50] and prints the largest number."	CO4	7 Marks

UNIT-IV

7.	a)	Discuss the role of software measurement	CO1	7 Marks
	b)	List and explain the types of software metrics.	CO1	7 Marks
		(OR)		
8.		What type of test planning will you plan for real time critical software? Design a test plan using test plan components.	CO6	14 Marks

UNIT-V

9.		Explain the following regression test selection techniques: i) Minimization ii) Dataflow iii) Safe iv) Ad hoc.	CO1	14 Marks
		(OR)		
10.		Demonstrate data driven testing on Bus Ticket Reservation application using regression testing tool.	CO5	14 Marks

CODE No.: 16BT60503 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

WIRELESS NETWORKS

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Differentiate between connectionless and connection oriented packet data network protocols.	CO2	6 Marks
	b)	Write short notes on portability, nomadicity, mobility and coverage.	CO1	8 Marks
		(OR)		
2.		We provide a wireless public phone with six lines to a ferry crossing between Helsinki and Stockholm carrying 100 passengers where, on the average, each passenger makes a 3-min telephone call every 2 hours. Find the following, i) What is the probability of a passenger approaching the telephone and more of the four lines are available? ii) What would be the average delay if the ferry had 200 passengers?	CO5	14 Marks

UNIT-II

3.	a)	Compare Public-key and secret key algorithms.	CO2	10 Marks
	b)	List the issues in Mobile IP.	CO1	4 Marks
		(OR)		
4.	a)	Write short notes on privacy and authentication requirements of wireless networks.	CO1	10 Marks
	b)	Brief about Challenge response scheme.	CO1	4 Marks

UNIT-III

5.	a)	How to handle MAC Management sub layer?	CO2	10 Marks
	b)	Differentiate between Probe and beacon.	CO2	4 Marks
		(OR)		
6.	a)	How do HPNA, DSL, and POTS share the telephone wirings?	CO2	8 Marks
	b)	Create a Home Access Networks using IEEE 802.11.	CO6	6 Marks

UNIT-IV

7.	a)	Explain the Overview of SMS operation.	CO1	10 Marks
	b)	Discuss about Service description option in SMS.	CO4	4 Marks
		(OR)		
8.	a)	Build the WAP programming architecture and Protocol layers.	CO6	10 Marks
	b)	Write the uses of i-Mode service in WAP.	CO1	4 Marks

UNIT-V

9.	a)	Create File Transfer Application using Bluetooth.	CO6	7 Marks
	b)	Build the Functional overview of the Bluetooth specification.	CO6	7 Marks
		(OR)		
10.		Considering that the encoded voice in Bluetooth is at 64Kbps in each direction. Find the following, i) Use packet format for the HV1 channels to show that these packets are sent every six slots. ii) Use packet format for the HV2 channel to find how often these packets are sent.	CO5	14 Marks

CODE No.: 16BT61205 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

CYBER SECURITY AND LAWS

[Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	In classifications of cyber crimes explain about cyber crime against property, organization, society and crimes emanating from **usenet** newsgroup.	CO3	10 Marks
	b)	Define the terms Techno-crime, Techno-vandalism	CO2	4 Marks
		(OR)		
2.		Outline the Indian Perspective on Cyber Crime and Indian ITA 2000.	CO6	14 Marks

UNIT-II

3.	a)	Illustrate the categories of Password cracking attacks? Interpret in what way this is different from the password cracking and password recovery?	CO3	7 Marks
	b)	Categorize DDoS attacks.	CO2	7 Marks
		(OR)		
4.		Define Spyware and keyloggers. Specify how Spyware and keyloggers are related. List and describe different types of keyloggers.	CO1	14 Marks

UNIT-III

5.		Analyze the consequences of not addressing the weakness in Information Technology Act. Illustrate it's Impact on State Government Powers & Information Technology Organizations.	CO6	14 Marks
		(OR)		
6.		Illustrate about the Digital Signatures in the ITA 2000.Impact of Oversights in ITA 2000 Regarding Digital Signatures. Current Scenario regarding Digital Signatures under the Indian IT Act.	CO2	14 Marks

UNIT-IV

7.		Discuss the Organizational Guidelines for Internet Usage and how Privacy is protected in an Organization. Discuss about Safe Computing and Usage Policy.	CO5	14 Marks
		(OR)		
8.		Summarize about Media and Asset Protection in case of Incident Handling and what kind of best practices can be followed.	CO5	14 Marks

UNIT-V

9.		Discuss about the Ethical Dimension of Cyber Crimes.	CO4	14 Marks
		(OR)		
10.		Illustrate the following i) Intellectual Property ii) Copyright iii) Patent iv) Trademarks v) Trade Secret vi) Trade Name vii) Domain Name.	CO1, CO5, CO6	14 Marks

CODE No.: 16BT71205 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-16) Supplementary Examinations, December – 2022

CRYPTOGRAPHY AND NETWORK SECURITY

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Write a short note on security attacks.	CO1	7 Marks
	b)	Differentiate Poly and Mono Alphabetic cipher techniques with example.	CO2	7 Marks
		(OR)		
2.	a)	Explain about various security services.	CO1	7 Marks
	b)	Explain the model for Internet security.	CO1	7 Marks

UNIT-II

3.	a)	With the help of a neat sketch, Analyze a single round of DES algorithm.	CO2	7 Marks
	b)	Identify the security issues of DES algorithm.	CO4	7 Marks
		(OR)		
4.	a)	Explain different cipher block modes of operation.	CO1	7 Marks
	b)	What is the important Feistel cipher in Cryptography?	CO1	7 Marks

UNIT-III

5.	a)	Identify the digital evidences and its respective admissibility in courts in cyber crimes.	CO6	7 Marks
	b)	List the public key cryptosystems requirements that must be fulfill to design a secure algorithm.	CO2	7 Marks
		(OR)		
6.	a)	Discuss the role of a compression function in a hash function.	CO1	7 Marks
	b)	Compare and contrast the principal differences between version 4 and version 5 of Kerberos.	CO2	7 Marks

UNIT-IV

7.	a)	Define web security threats. Identify the consequences and counter measures of such security threats?	CO3	7 Marks
	b)	With a neat diagram explain the steps performed by sending PGP entity to transmit a message that is both signed and encrypted.	CO5	7 Marks
		(OR)		
8.	a)	State the roles of different participants in SET system?	CO1	7 Marks
	b)	Explain how the E-mail authentication and confidentiality is achieved using PGP.	CO5	7 Marks

UNIT-V

9.	a)	Explain about Statistical Anomaly Detection.	CO1	7 Marks
	b)	Identify the preventive measures for DoS / DDoS attacks.	CO2	7 Marks
		(OR)		
10.	a)	Discuss the main actions of a packet filter.	CO1	7 Marks
	b)	Explain different types of malwares.	CO1	7 Marks

CODE No.: 19BT6HS01 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

PRINCIPLES OF BUSINESS ECONOMICS AND ACCOUNTANCY

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

	UNIT-I				
1.	Examine utility and significance of Business Economics.	12 Marks	L2	CO1	PO1
	(OR)				
2.	What is demand forecasting? Demand forecasting is a key for success of an enterprise. Explain	12 Marks	L2	CO1	PO1
	UNIT-II				
3.	Interpret the concepts of Isoquants and Isocosts.	12 Marks	L3	CO2	PO2
	(OR)				
4.	Solve the following from the given data – i) BEP ii) Margin of Safety for 30,000 units of sales iii) Sales required to earn a profit of Rs.15,000/- Selling Price /unit – Rs.20.00/- Variable Cost/unit – Rs.8.00/- Fixed Cost – Rs.24, 000/-	12 Marks	L3	CO2	PO2
	UNIT-III				
5.	Describe with a neat graph, price and output determination under monopolistic competition.	12 Marks	L2	CO3	PO2
	(OR)				
6.	Sketch the characterization of Perfect Competition.	12 Marks	L3	CO3	PO2
	UNIT-IV				
7.	Define "Trial Balance". Explain its' significance, objectives and limitations.	12 Marks	L2	CO4	PO2
	(OR)				
8.	Pass the necessary journal entries for the following transactions in the books of Raghava: 2019 Jan. 1 Raghava commenced a business with Rs.15,00,000/- Jan. 6 Bought goods from Harika for cash Rs. 1,04,500/- Jan. 17 Bought goods by Suri Rs. 1,48,000/- Jan. 21 Commission paid Rs. 3,600/- Jan 28 Cash deposited in Bank Rs.10,000/- Jan. 31 Salaries paid through cheque Rs.20,000/-	12 Marks	L4	CO4	PO12
	UNIT-V				
9.	Discuss relative merits and demerits of computerized accounting.	12 Marks	L2	CO5	PO2

(OR)

10. From the following trail balance as on September 30, 2018 prepare trading, profit and loss account for the year ended December 31, 2018 and a balance sheet as on that date: 12 Marks L3 CO5 PO12

Particulars	Amount	Particulars	Amount
Sundry debtors	64,000	Sales	2,65,000
Opening Stock	44,000	Sundry Creditors	25,300
Cash in hand	70	Bills payable	15,000
Cash at bank	3,090	Capital	1,59,000
Plant and Machinery	35,000		
Trade Expenses	2,150		
Salaries	4,450		
Carriage outwards	800		
Rent	1,800		
Purchases	2,37,740		
Discounts	2,200		
Land and Building	69,000		
	464,300		**464,300**

Also adjust the following:

i) Stock as on December 31, 2018 amounted to Rs.24,900/-
ii) Rent outstanding Rs.170/-
iii) Trade expenses yet to be paid Rs.300/-
iv) Write off bad debts Rs 800/-
v) Depreciate Plant and Machinery @ 10% p.a.

CODE No.: 19BT6HS02 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

ORGANIZATIONAL BEHAVIOUR

[Civil Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

	UNIT-I				
1.	Explain the Organizational Behavior Levels?	12 Marks	L2	CO1	PO1
	(OR)				
2.	Describe the various subjects contributing to the discipline of OB?	12 Marks	L2	CO1	PO1
	UNIT-II				
3.	Discuss the role of brain and mind in individual behavior.	12 Marks	L2	CO2	PO1
	(OR)				
4.	Briefly explain the different natures of Personality.	12 Marks	L2	CO1	PO1
	UNIT-III				
5.	Illustrate the stages in group formation and group development.	12 Marks	L3	CO3	PO9
	(OR)				
6.	Examine the various factors that influence perception.	12 Marks	L4	CO3	PO3
	UNIT-IV				
7.	Sketch the leadership with your own examples.	12 Marks	L3	CO4	PO2
	(OR)				
8.	Interpret various leadership styles and explain the Charismatic leadership.	12 Marks	L3	CO4	PO12
	UNIT-V				
9.	Interpret the organizational change.	12 Marks	L3	CO5	PO2
	(OR)				
10.	Demonstrate the benefits of Organizational Development.	12 Marks	L3	CO5	PO1

CODE No.: 19BT51505 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

SOFTWARE TESTING

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Differentiate error, bug, defect, fault, failure, test ware and incident giving examples of each.	6 Marks	L4	CO1	PO2
	b)	With a neat diagram explain Software Testing model.	6 Marks	L4	CO1	PO1
		(OR)				
2.	a)	Compare and contrast Positive testing and Negative testing.	6 Marks	L4	CO1	PO2
	b)	Explain the model for software testing.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Discuss about Boundary value Analysis technique in software testing.	6 Marks	L2	CO2	PO1
	b)	Illustrate with an example how decision table is used to generate the test cases.	6 Marks	L4	CO2	PO3
		(OR)				
4.	a)	Discuss the role of primary mutants and secondary mutants in the mutation testing with an example.	6 Marks	L2	CO2	PO2
	b)	Explain the guidelines for developing the test plan.	6 Marks	L2	CO3	PO1
		UNIT-III				
5.	a)	Define test script and explain the steps in developing test script.	6 Marks	L2	CO3	PO1
	b)	Illustrate how test script is developed and implemented for testing software.	6 Marks	L4	CO4	PO2
		(OR)				
6.	a)	Discuss the characteristics of good test scenario.	6 Marks	L4	CO3	PO2
	b)	List the advantages and disadvantages of Equivalence Partitioning technique.	6 Marks	L4	CO3	PO2
		UNIT-IV				
7.	a)	Justify the role of classifying software metrics on monitoring the progress of the software project.	6 Marks	L2	CO5	PO2
	b)	With a neat diagram, explain the selective retest technique functionalities for producing quality software.	6 Marks	L2	CO5	PO2
		(OR)				
8.	a)	What are the types of regression testing and write the steps involved in defining regression testing problem.	6 Marks	L2	CO5	PO2
	b)	Design test cases by using regression testing to produce quality software.	6 Marks	L2	CO6	PO1
		UNIT-V				
9.	a)	Summarize the key elements involved in Selection of Testing Tools**.**	6 Marks	L2	CO6	PO1
	b)	What type of test planning will you plan for real time critical software? Design a test plan using test plan components.	6 Marks	L3	CO6	PO3
		(OR)				
10	a)	With a neat diagram explain Test Organization**.**	6 Marks	L2	CO6	PO2

. b) Explain the need for automated testing tools. 6 Marks L2 CO6 PO1

CODE No.: 19BT60101 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

STEEL STRUCTURES

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	Design a bracket connection to transfer an end reaction of 225 kN as shown in fig.1. The end-reaction from the girder acts at an eccentricity of 300 mm from the face of the column flange. Design bolted joint connecting the tee-flange with the column flange. Steel is of grade E250 and bolts of grade 4.6.	12 Marks	L6	CO1	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10

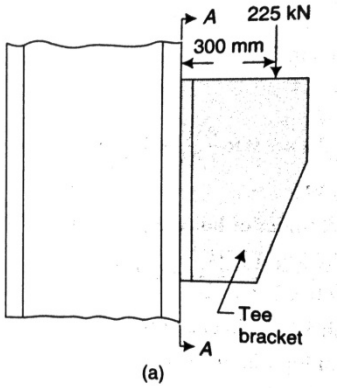


Fig.1

(OR)

2.	Determine the design strength of the welded joints, if two plates of 16 mm and 14 mm thickness are to be joined in the workshop by. i) a single V-groove weld ii) a double V-groove weld The effective length of the weld is 175 mm.	12 Marks	L4	CO1	PO1 PO2 PO5 PO6 PO8

UNIT-II

3.	Design a simply supported beam of span 4m to carry a factored udl of 30 kN/m.	12 Marks	L6	CO2	PO1 PO2 PO3 PO4 PO5 PO6 PO8

(OR)

4.	A beam is simply supported over a span of 6m. It supports one iron beam at mid span exerting 90 kN. Design the beam with ISWB section with flange plates. Assume the beam is not supported laterally.	12 Marks	L6	CO2	PO1 PO2 PO3 PO4 PO5 PO6 PO8

UNIT-III

5.		A diagonal member of a roof truss carries a maximum pull of 300 kN. Design the section and its connection with a 16 mm thick gusset plate. The length of the connection is limited to 340 mm. Design the lug angles also if required. The steel of grade E 250 and bolts of grade 4.6 are to be used.	12 Marks	L6	CO3	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10
		(OR)				
6.		Calculate the design compressive load for a stanchion 350 @ 710.2 N/m, 3.5 m high. The column is restrained in direction and position at both the ends. It is to be used as an uncased column in a single-storey building. Use steel of grade E 250.	12 Marks	L4	CO3	PO1 PO2 PO6 PO8

UNIT-IV

7.		Design a laced column 8 m long with two channels placed toe-to-toe to carry factored axial load of 1300 kN. The column may be assumed to have restrained in position but not in direction at both ends. Assume steel of grade E 250 and bolts of grade 4.6.	12 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10
		(OR)				
8.		A column ISHB 350 @ 661.2 N/m carries an axial compressive factored load of 1700 kN. Design a suitable gusset base. The base rests on M20 grade concrete pedestal.	12 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO10

UNIT-V

9.		Determine the basic wind pressure to be considered for a shed in the outskirts of Bangalore. Given Structure : General purpose with probable life of 50 years Terrain category: 1, Building class B. Eye board height : 11 m, Topography : Plain area	12 Marks	L4	CO5	PO1 PO2 PO4 PO6 PO8
		(OR)				
10.	a)	Distinguish between determinate and indeterminate trusses.	4 Marks	L4	CO5	PO1 PO2
	b)	What are the functions of an eave strut?	4 Marks	L2	CO5	PO1
	c)	Why it is necessary to design truss member for both compression and tension forces?	4 Marks	L2	CO5	PO1

CODE No.: 19BT60104 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

AIR AND NOISE POLLUTION AND CONTROL

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Distinguish between primary and secondary air pollutants with examples.	6 Marks	L2	CO1	PO1 PO2 PO6 PO7 PO10
	b)	Enumerate briefly about various meteorological factors that influence the air pollution.	6 Marks	L4	CO1	PO1 PO2 PO4 PO5
		(OR)				
2.	a)	Differentiate between the various types of plume behavior with a neat sketch: i) Looping plume and Coning plume ii) Neutral plume and Fanning Plume	6 Marks	L4	CO1	PO1 PO2 PO4 PO6 PO7 PO10
	b)	Define wet and dry adiabatic lapse rate. Write the importance of stack height in relation with air pollution.	6 Marks	L4	CO1	PO1 PO6 PO7 PO10

UNIT-II

3.		Explain in brief about the effects of art treasures in India and other countries.	12 Marks	L4	CO2	PO1 PO2 PO6 PO7
		(OR)				
4.		Compare the effects of air and noise pollution on human health.	12 Marks	L4	CO2	PO1 PO2 PO10

UNIT-III

5.		Classify the sampling methods and explain in detail about them.	12 Marks	L4	CO3	PO1 PO2 PO5 PO6 PO7 PO8 PO10

(OR)

6.	a)	List the various stack sampling techniques. Explain briefly with a neat sketch.	6 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO6 PO10
	b)	Discuss in brief about the recent trends in sampling of stack emissions.	6 Marks	L4	CO3	PO1 PO2 PO7
		UNIT-IV				
7.		Discuss about the design and operation of wet scrubbers and electrostatic precipitators to remove particulate matter present in air with a neat sketch.	12 Marks	L4	CO4	PO1 PO2 PO4 PO5 PO7 PO10
		(OR)				
8.	a)	Explain the methods available to control of gaseous pollutants.	6 Marks	L4	CO4	PO1 PO2 PO4 PO5 PO7
	b)	Explain the working principle of bio filters to control air pollution with neat sketch.	6 Marks	L4	CO4	PO1 PO2 PO4 PO5 PO7
		UNIT-V				
9.		Compare the air pollutants that are emitted from petroleum refineries and cement industry.	12 Marks	L4	CO5	PO1 PO2 PO4 PO6 PO7
		(OR)				
10.	a)	Explain the emission standards of air pollution in industrial areas.	6 Marks	L2	CO5	PO1 PO2 PO6 PO7 PO8
	b)	Mention the noise standards in industrial areas and how to control the noise from industrial operations.	6 Marks	L4	CO5	PO1 PO4 PO6 PO7 PO8

CODE No.: 19BT60114 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

SOLID AND HAZARDOUS WASTE MANAGEMENT
[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Examine the functional elements of an effective solid waste management system.	6 Marks	L4	C01	PO1 PO2 PO6 PO7
	b)	Describe the effects of improper disposal of solid waste on human health and environment.	6 Marks	L2	CO1	PO1 PO6 PO7
		(OR)				
2.	a)	Compare and contrast the characteristics of solid wastes in Indian cities and that of developed countries.	6 Marks	L4	CO1	PO1 PO2 PO6 PO7
	b)	Discuss the role of NGO's in municipal solid waste management.	6 Marks	L2	CO1	PO1 PO6 PO7

UNIT-II

3.		Assume you were the engineer responsible for handling the solid waste generated in the Tirupati city. Discuss how your team of experts quantify the waste generated in the city. What are the onsite processing techniques that you would adopt for managing the waste generation?	12 Marks	L4	CO2	PO1 PO2 PO4 PO5 PO6 PO7 PO11 PO12
		(OR)				
4.	a)	Compare the long term and short term planning methods for quantification of wastes generated in your city.	6 Marks	L4	CO2	PO1 PO6 PO7
	b)	Explain the necessity of onsite segregation of solid waste.	6 Marks	L2	CO2	PO1 PO6 PO7

UNIT-III

5.	a)	Discuss the operation and maintenance of transfer stations under Indian conditions.	6 Marks	L4	CO3	PO1 PO2 PO6 PO7
	b)	"Does transfer stations play vital role in the process of municipal solid waste management" justify.	6 Marks	L4	CO3	PO1 PO2 PO6 PO7

(OR)

6.	a)	Analyze the most economical method of collection of municipal solid waste in your city.	6 Marks	L4	C03	PO1 PO2 PO4 PO6 PO7 PO11
	b)	Discuss briefly about layout of collection routes.	6 Marks	L2	CO3	PO1 PO6 PO7

UNIT-IV

7.	a)	Differentiate between composting and pyrolysis processing techniques of municipal solid waste.	6 Marks	L4	C04	PO1 PO2 PO5 PO6 PO7
	b)	Contrast the various adverse effects of a landfill leach ate caused due to improper dumping of municipal solid waste.	6 Marks	L4	C04	PO1 PO2 PO6 PO7

(OR)

8.		Assume you were engineer responsible for disposal of municipal solid waste generated in your city, which generates 120tons of solid waste every day. How your team of experts will develop a solution considering environmental safety and sustainability. Also Draw a neat sketch of a sanitary landfill and mention its components.	12 Marks	L6	C04	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO10

UNIT-V

9.	a)	Contrast the various adverse effects of improper handling of hazardous waste on human health and environment.	6 Marks	L4	C05	PO1 PO2 PO6 PO7
	b)	Summarize in detail the sources and generation of Bio-medical waste.	6 Marks	L4	C05	PO1 PO2 PO6 PO7

(OR)

10.	a)	Assume you were engineer responsible for resource recovery from solid waste generated in your city. Analyze most economical method of resource recovery from waste considering environmental sustainability.	6 Marks	L4	C05	PO1 PO2 PO5 PO6 PO7
	b)	Discuss methods adopted for Bio-medical waste treatment and explain any one method of treatment.	6 Marks	L2	C05	PO1 PO5 PO6 PO7

CODE No.: 19BT60117 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

HIGHWAY CONSTRUCTION AND MAINTENANCE

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss about WBM road construction as per IRC.	6 Marks	L2	CO1	PO1 PO5 PO8
	b)	List and discuss different methods of bituminous pavement construction.	6 Marks	L4	CO1	PO1 PO2 PO5
		(OR)				
2.	a)	Classify the different types of joints in cc pavements? Discuss briefly.	6 Marks	L4	CO1	PO1 PO2 PO10
	b)	Write in detail about Interlocking concrete paver block with neat sketch.	6 Marks	L2	CO1	PO1 PO10

UNIT-II

3.		Compare and contrast different types of soil stabilization techniques suitable for road construction.	12 Marks	L4	CO2	PO1 PO2 PO5 PO8
		(OR)				
4.	a)	Write a short note on latest developments in stabilization methods.	6 Marks	L2	CO2	PO1 PO12
	b)	Classify the different methods of mix design in Mechanical Stabilization. Explain any one.	6 Marks	L4	CO2	PO1 PO2 PO5

UNIT-III

5.	a)	Which type of road construction method is suitable for water logged areas? Explain why.	6 Marks	L2	CO3	PO1 PO5
	b)	The maximum quantity of water to be discharged by the two side drains on a highway section is 1.8 m^3/sec. Design the side drains for the following conditions: Silty loam soil with maximum permissible velocity of flow = 0.77 m/sec. Roughness coefficient = 0.028.	6 Marks	L6	CO3	PO1 PO2 PO3 PO4 PO10
		(OR)				
6.		The maximum quantity of water expected in one of the open longitudinal drains on clayey soil is 1.3 m^3/sec. Design the cross section and longitudinal slope of trapezoidal drain assuming the bottom width of the trapezoidal section to be 0.75 m and cross slope to be 1.0 vertical to 1.5 horizontal. The allowable velocity of flow in the drain is 0.88 m/sec and Manning's roughness coefficient is 0.02.	12 Marks	L6	CO4	PO1 PO2 PO3 PO4

UNIT-IV

7.	a)	Write in detail about compacting equipment for bituminous mixes.	6 Marks	L2	CO4	PO1 PO5
	b)	Distinguish between scrapers and dozers in highway construction.	6 Marks	L4	CO4	PO1 PO2
		(OR)				
8.	a)	Briefly discuss piles and pile driving equipments in detail.	6 Marks	L2	CO4	PO1 PO5
	b)	Categorize the highway construction equipment based on the suitability for different types of soil.	6 Marks	L4	CO4	PO1 PO2 PO5

UNIT-V

9.	a)	Enlist the various flexible pavement failures.	6 Marks	L2	CO5	PO1 PO6
	b)	Discuss why road side development is important in highway construction.	6 Marks	L4	CO5	PO1 PO2 PO6 PO7
		(OR)				
10.	a)	What is pavement evaluation? Contrast the importance of pavement evaluation.	6 Marks	L2	CO5	PO1 PO6
	b)	Suggest any few maintenance and improvement techniqes for the rectification of transeverse cracks in pavements.	6 Marks	L4	CO5	PO1 PO2 PO5

CODE No.: 19BT60118 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

INDUSTRIAL WASTEWATER TREATMENT

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define the term characteristics of wastewater and explain the importance of determination of characteristics of wastewater for the purpose of design of treatment plant.	6 Marks	L4	CO1	PO1 PO2
	b)	Discuss self-purification of a stream and evaluate its usefulness for aquatic ecosystem and in turn to the society.	6 Marks	L5	CO1	PO1 PO2 PO6 PO7
		(OR)				
2.	a)	List out any six the physical and chemical characteristics of treated effluent for disposal into surface water bodies and public sewers as per the IS tolerance limits for disposal of industrial effluents.	6 Marks	L2	CO1	PO1 PO2 PO6 PO7 PO8
	b)	A city discharges 20000 m^3/day of sewage into a river whose rate of flow is 0.7 m^3/sec. Determine D.O. deficit values at 10 km interval, and draw a profile for 100 km and analyse the D.O. variation from the following data: River water: BOD = 10 mg/L, Temperature = 23°C, DO = 8.2 mg/L. Sewage: BOD = 150 mg/L, Temperature = 25°C, DO = 2.0 mg/L. Velocity of mix = 0.25 m/sec, R'= 0.4, K' = 0.23.	6 Marks	L4	CO1	PO1 PO2 PO5

UNIT-II

3.	a)	State the function and describe the working principle of the following treatment units with neat sketch. i) Screen chamber ii) Grit chamber	6 Marks	L3	CO2	PO1 PO2 PO10
	b)	Design a circular primary sedimentation tank for a wastewater quantity 2000 m^3/d with suspended solids concentration 1000 mg/L. Assume the surface overflow rate as 20 m^3/m^2/d, and liquid depth in the tank is 3 m, Free Board as 0.5 m and bottom floor slope as 1:10.	6 Marks	L6	CO2	PO1 PO2 PO3 PO8
		(OR)				
4.		Design an activated sludge completely mixed reactor for an industrial effluent flow of 1000 m^3/day having 5 day BOD @20°C = 500 mg/L. Assume necessary parameters and constants as: Y = 0.5 kg/kg, k_d = 0.04 d^{-1}, MLSS = 3000 mg/l, the underflow concentration = 12000 mg/l and the mean cell residence time = 10 days. Determine i) the volume of the reactor, ii) the mass and the volume of solids that must be wasted each day, and iii) the recycle ratio.	12 Marks	L6	CO2	PO1 PO2 PO3 PO5 PO6 PO8

UNIT-III

5.	a)	Analyze any two different techniques that can be used for removal of color and odor from wastewater with neat sketches.	6 Marks	L4	CO3	PO1 PO2 PO5 PO6 PO12
	b)	Draw the lime treatment process flow diagram for phosphorus removal and explain the treatment process.	6 Marks	L2	CO3	PO1 PO2 PO5
		(OR)				
6.	a)	Explain the Reverse-osmosis process for the removal of colloidal and dissolved solids in wastewater treatment with neat sketch.	6 Marks	L2	CO3	PO1 PO2 PO10
	b)	Analyze the chemical and biological nitrification - denitrification treatment processes for the removal of nitrogen in the wastewater treatment.	6 Marks	L4	CO3	PO1 PO2 PO5
		UNIT-IV				
7.	a)	Write the sources and characteristics of waste water from a typical brewery industry. Suggest and draw a suitable typical treatment flow sheet diagram for treating of brewery wastewater.	6 Marks	L3	CO4	PO1 PO2 PO5 PO10
	b)	Write the sources and characteristics of waste water from a typical dairy industry. Suggest and analyze a suitable treatment and draw a flow sheet diagram for treating the dairy wastewater.	6 Marks	L4	CO4	PO1 PO2 PO5 PO10
		(OR)				
8.	a)	Explain the treatment used in recovery of chemicals from black liquor of pulp and paper mill industry with neat sketch of treatment flow diagram.	6 Marks	L2	CO4	PO1 PO2 PO5 PO10
	b)	Analyze a typical treatment of wastewater from sugar mill with neat flow diagram. Mention at each stage of treatment, the amount of contaminants that are expected to be removed in percentage satisfying the IS tolerance limits for disposal of treated effluents.	6 Marks	L4	CO4	PO1 PO2 PO5 PO6 PO7 PO8 PO10
		UNIT-V				
9.		Analyze the significance of the following in the present context for the clean environment and sustainable development. i) Factors encouraging the waste minimization, and ii) Remediation of aquatic life in a polluted stream.	12 Marks	L4	CO5	PO1 PO2 PO6 PO7 PO8 PO12
		(OR)				
10.	a)	Enlist the characteristics of wastewater generated from the tannery industries and compare with the IS tolerance limits for those contaminants for disposal into inland surface water bodies and public sewers.	6 Marks	L4	CO5	PO1 PO2 PO6 PO7 PO8
	b)	Write short note on treatment of wastewater by i) Volume reduction, and ii) Strength reduction.	6 Marks	L2	CO5	PO1 PO2 PO5

CODE No.: 19BT60123 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

FIRE ENGINEERING

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain about the fire triangle.	6 Marks	L2	CO1	PO1 PO7
	b)	Compare the fire properties of solid, liquid and gases.	6 Marks	L4	CO1	PO1 PO2 PO7
		(OR)				
2.		Discuss any case study related to Boiling liquid expanding vapour explosion (BLEVE) in detail.	12 Marks	L4	CO2	PO1 PO2 PO4 PO6 PO7
		UNIT-II				
3.		List the types of fire extinguishers in the fire preventing system. Suggest suitable one for prevention of class A fire with justification.	12 Marks	L4	CO2	PO1 PO2 PO6
		(OR)				
4.		Compare the following types of fire. i) Class C and Class D ii) Class B and Class A	12 Marks	L4	CO2	PO1 PO2
		UNIT-III				
5.		Differentiate active and passive fire protection systems	12 Marks	L4	CO3	PO1 PO2 PO7
		(OR)				
6.		Why hydraulics test is necessary for fire extinguisher? Discuss in detail.	12 Marks	L4	CO3	PO1 PO2 PO5 PO8
		UNIT-IV				
7.		How do you calculate the fire load in building? List few fire resistant materials for a residential building	12 Marks	L4	CO4	PO1 PO2 PO7
		(OR)				
8.		As an engineer how would you describe fire safety as an essential parameter in designing residential building?	12 Marks	L4	CO4	PO1 PO2
		UNIT-V				
9.	a)	Compare the detonation and blast waves with suitable examples.	6 Marks	L4	CO5	PO1 PO2
	b)	Elaborate the details of Explosion relief of large enclosure.	6 Marks	L2	CO5	PO1 PO7 PO8
		(OR)				

10.	As an engineer how would you describe explosion protection systems in industry and residential building?	12 Marks	L4	CO5	PO1 PO2 PO7

CODE No.: 19BT60201 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

POWER ELECTRONICS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Sketch and explain switching characteristics of SCR.	6 Marks	L2	CO1	PO1
	b)	Identify and enlist the features of a fully controlled power switch suitable for medium voltage and high frequency industrial applications.	6 Marks	L2	CO1	PO6
		(OR)				
2.	a)	Explain the necessity of parallel combination of SCRs in a string and suggest appropriate methods to improve the string efficiency of parallel connected SCRs.	6 Marks	L2	CO1	PO7
	b)	A thyristor string consists of five thyristors in series. The string voltage is 5kV. Maximum permissible blocking voltage of each thyristor is 1200V and maximum blocking current is 15mA. Calculate the value of equalizing resistance to be connected in parallel with each thyristor so as to improve the string efficiency.	6 Marks	L3	CO1	PO7

UNIT-II

3.	a)	Classify and draw the circuit schemes of the converters based on number of output pulses produced and compare their performances.	6 Marks	L2	CO3	PO1
	b)	Three phase fully controlled rectifier is connected to three phase AC supply of 230 V, 50 Hz. load current is continuous and has a negligible ripple. If the average load current Idc is 150 A and the commutating inductance Lc is 0.1 mH. Determine the overlap angle when $\alpha = 10°$.	6 Marks	L3	CO3	PO2
		(OR)				
4.	a)	Identify the gating sequence of a three phase six pulse rectifier with R-load for $\alpha = 75^{O}$ and derive an expression for average output voltage.	8 Marks	L2	CO3	PO1
	b)	Find the magnitude of per phase input supply voltage, if the resistive load of 10 Ohms is connected to a three-phase full converter and the connected load takes 5 kW for a firing angle delay of 70^{O}.	4 Marks	L3	CO3	PO2

UNIT-III

5.		With the help of a neat circuit diagram, relevant waveforms, and expressions, discuss the operation of complementary commutation technique.	12 Marks	L1	CO2	PO5
		(OR)				
6.	a)	Explain the working of step-down chopper with RL-load and derive an expression for average value of output voltage.	6 Marks	L2	CO2	PO1
	b)	A Circuit employing class-B commutation has C=20 μF and L=5 μH. Initial voltage across capacitor is 230 V. For a constant load current of 250 A, calculate the voltage across main thyristor.	6 Marks	L3	CO2	PO4

UNIT-IV

7.	Discuss the operation of a single phase AC voltage controller with RL-load for firing angle α greater than load phase angle, ϕ. Also show that for α less than ϕ, the output voltage of AC voltage controller cannot be regulated.	12 Marks	L3	CO3	PO1

(OR)

8.	Develop a single phase bridge type cycloconverter to produce an output frequency 1/6 times that of source frequency. With the help of a neat circuit diagram and relevant waveforms explain its operation.	12 Marks	L4	CO3	PO3

UNIT-V

9.	Explain the operation of 1-phase full bridge voltage source inverter with R-load. Sketch relevant waveforms and derive the expression for instantaneous output voltage.	12 Marks	L2	CO4	PO1

(OR)

10.	With the help of neat circuit diagram and relevant waveforms, analyze 120^{o} mode of operation of a three phase full bridge inverter with resistive load.	12 Marks	L4	CO4	PO2

CODE No.: 19BT60202 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

POWER SYSTEM ANALYSIS

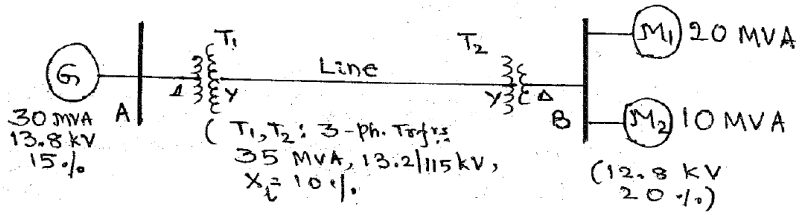
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Draw the per unit reactance diagram for the system shown in figure. Choose a base of 30 MVA, 13.8 kV in the generator circuit. Assume the reactance of the line to be 80 Ohms. — 6 Marks — L3 — CO1 — PO2



b) The parameters of a 4 – bus system are as follows. — 6 Marks — L4 — CO1 — PO5

Bus code	Line impedance (pu)	Half Line Charging admittance (pu)
1- 2	0.2 + j 0.8	j 0.02
2- 3	0.3 + j 0.9	j 0.03
2- 4	0.25 + j 1.0	j 0.04
3- 4	0.2 + j 0.8	j 0.02
1- 3	0.1 + j 0.4	j 0.01

Draw the network and find bus admittance matrix using direct inspection method.

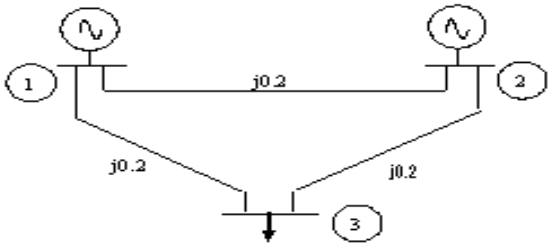
(OR)

2. Develop step-by-step algorithm for Zbus building considering all possible modifications for a network containing no mutual and no phase shifting transformers. — 12 Marks — L3 — CO1 — PO5

UNIT-II

3. Carry out for one iteration of load flow solution for the system shown in Figure by G-S method. Take Q limits of generator 2 as $0 \le Q \le 5$ p.u. — 12 Marks — L4 — CO2 — PO4

Bus 1 slack bus $V_{specified} = 1.05\angle 0°$
Bus 2 PV bus $|V|_{specified} = 1.00$ p.u., $P_G = 3$ p.u.
Bus 3 PQ bus $P_D = 4$ p.u., $Q_D = 2$ p.u.



(OR)

4.	a)	Derive the necessary expressions of Jacobian matrix elements for fast decoupled load flow method.	6 Marks	L3	CO2	PO1
	b)	With flow chart, explain the computational procedure for load flow solution using fast decoupled method and also derive the necessary equations.	6 Marks	L3	CO2	PO2

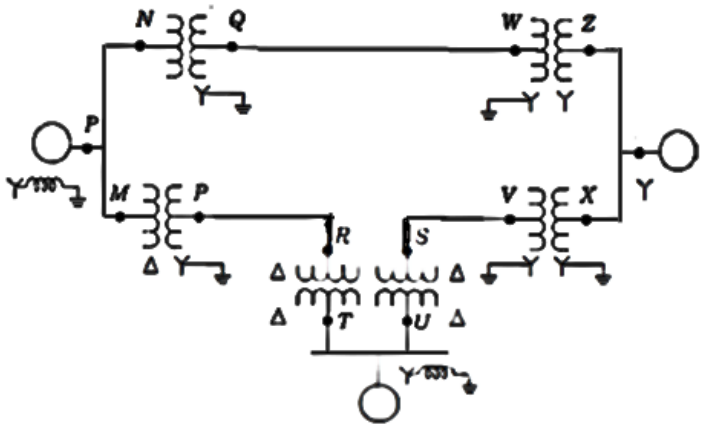
UNIT-III

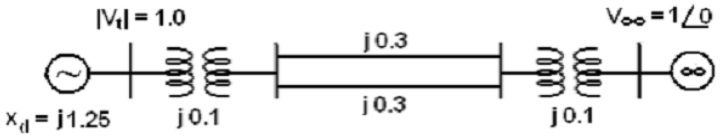
5.	a)	Derive the expression for fault current when three phase balanced fault occurs in power system.	6 Marks	L2	CO3	PO2
	b)	The bus impedance matrix of four bus system with values in p.u. is given by, $$Zbus = j\begin{bmatrix} 0.15 & 0.08 & 0.04 & 0.07 \\ 0.08 & 0.15 & 0.06 & 0.09 \\ 0.04 & 0.06 & 0.13 & 0.05 \\ 0.07 & 0.09 & 0.05 & 0.12 \end{bmatrix}$$ In this system generators are connected to buses 1 and 2 and their sub transient reactances were included when finding Z_{bus}. If pre-fault current is neglected, find sub-transient current in p.u. for a 3 phase fault on a bus 4. Assume pre-fault voltage is 1 p.u.	6 Marks	L3	CO3	PO2

(OR)

6.		A synchronous generator and a synchronous motor each rated 20MVA, 12.66KV having 15% reactance are connected through transformers and a line as shown in fig. the transformers are rated 20MVA,12.66/66KV and 66/12.66KV with leakage reactance of 10% each. The line has a reactance of 8% on base of 20MVA, 66 KV. The motor is drawing 10MW at 0.8 leading power factors and a terminal voltage 11KV when symmetrical three phase fault occurs at the motors terminals. Determine the generator and motor currents. Also determine the fault current.	12 Marks	L4	CO3	PO4

UNIT-IV

7.	a)	Draw the positive, negative and *zero sequence* networks for the network shown in the figure: 	6 Marks	L3	CO3	PO4

	b)	In a three phase four wire system, the sequence component of currents and voltages are as follows: $I_{\infty} = (0.1 + 0.2j)\ pu;$ $V_{\infty} = (0.1 + 0.2j)\ pu$ $I_{a1} = (0.8 + 0.2j)\ pu;$ $V_{a1} = (1 + 0j)\ pu$ $I_{a2} = (0.2 + 0.2j)\ pu;$ $V_{a2} = (0.2 + 0.2j)\ pu$ Determine the total three phase complex power in MVA if the base is 100 MVA and show that the symmetrical component transformation is power invariant.	6 Marks	L3	CO3	PO2
		(OR)				
8.	a)	Derive the necessary equation to determine the fault current for a single line to ground fault in an un-loaded alternator and draw the sequence network diagram.	6 Marks	L3	CO3	PO1
	b)	A 3-phase, 11 kV, 25 MVA generator with X_0 = 0·05 p.u., X_1 = 0·2 p.u. and X_2= 0·2 p.u. is grounded through a reactance of 0·3 Ohms. Calculate the fault current for a single line to ground fault.	6 Marks	L3	CO3	PO4
		UNIT-V				
9.	a)	Derive an expression for the maximum power transfer between two nodes. Show that this power is maximum when $X = \sqrt{3R}$, where X is the reactance and R the resistance of the system.	6 Marks	L3	CO4	PO2
	b)	Define the power system stability and enumerate the varoius methods of improving the powr system stability in the event of distrubances.	6 Marks	L1	CO4	PO7
		(OR)				
10.	a)	Explain in detail, the equal area criterion. How can the equal area criterion be applied to find the maximum additional load that can be suddenly added?	6 Marks	L2	CO4	PO1
	b)	A generator supplies 1.0 p.u. power to an infinite bus as shown in Figure. The terminal voltage and infinite bus voltage are 1.0 p.u.. All the reactance are on a common base. Determine steady state stability limit: i) When both lines are in. ii) When one line is switched off. 	6 Marks	L4	CO4	PO4

❀ ❀ ❀

CODE No.: 19BT60204 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

HIGH VOLTAGE ENGINEERING

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Enumerate the different types of electric field and justify the factors that influence the field strength between the electrodes.	6 Marks	L1	CO1	PO1
	b)	What are the various reasons for over voltages and enumerate the adverse effects of over voltages in power system?	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Define the term degree of uniformity of electric fields and explain its significance in determining the nature of field.	6 Marks	L2	CO1	PO1
	b)	What is a surge absorber? Write a short note on functionality of a surge absorber.	6 Marks	L2	CO1	PO1

UNIT-II

3.	a)	State and explain Paschen's law. How do you account for the minimum voltage for breakdown under a given pdcondition?	6 Marks	L2	CO1	PO1
	b)	What will the breakdown strength of air be for small gaps (1 mm) and large gaps (20 cm) under uniform field conditions and standard atmospheric conditions?	6 Marks	L3	CO1	PO2
		(OR)				
4.	a)	Justify, how the breakdown in non-uniform fields is different from the breakdown in uniform fields?	6 Marks	L2	CO1	PO1
	b)	In an experiment for determining the breakdown strength of transformer oil, the following observations are made. Determine the power law dependence between the gap spacing and the applied voltage of the oil.	6 Marks	L3	CO1	PO2

Gap Spacing(mm)	4	6	10	12
Voltage at Breakdown(kV)	90	140	210	255

UNIT-III

5.	a)	Explain the different schemes for cascade connection of transformers for producing very high AC. voltages.	6 Marks	L3	CO2	PO5
	b)	Determine the ripple voltage and regulation of a 10 stage Cockcroft-Walton type DC voltage multiplier circuit having a stage capacitance = 0.01 μF, supply voltage =100 kV at a frequency of 400 Hz and a load current = 10 mA.	6 Marks	L3	CO2	PO2
		(OR)				
6.	a)	Describe the construction, principle of operation and application of a multistage Marx's Surge Generator.	6 Marks	L2	CO2	PO1
	b)	An impulse generator has eight stages with each condenser rated for 0.12 μ F and 125 kV. The load capacitor available is 1000 pf. Find the series resistance and the damping resistance needed to produce 1.2/50 μ s impulse wave. What is the maximum output voltage of the generator, if the charging voltage is 120 kV?	6 Marks	L3	CO2	PO4

UNIT-IV

7.	a)	Compare the relative advantages and disadvantages of using a series resistance microammeter and a potential divider with an electrostatic voltmeter for measuring high DCvoltages?	6 Marks	L2	CO3	PO1
	b)	A generating voltmeter is required to measure voltage between 15 kV to 250 kV. If the indicating meter reads a minimum current of 2 μA and maximum of 35 μA, determine the capacitance of the generating voltmeter. Assume that the speed of driving synchronous motor is 1500 rpm.	6 Marks	L3	CO3	PO2
		(OR)				
8.	a)	Explain how a sphere gap can be used to measure the peak value of voltages. What are the parameters and factors that influence such voltage measurement?	6 Marks	L2	CO3	PO5
	b)	A peak reading voltmeter is required to measure voltage upto 150 kV. The peak voltmeter uses an RC circuit, a microammeter and a capacitance potential divider. The potential divider has a ratio of 1200 : 1 and the micrometercan read upto 10 μA. Determine the value of R and C if the time constant of RC circuit is 8 secs.	6 Marks	L3	CO3	PO2

UNIT-V

9.	a)	What is meant by non-destructive testing? Explain the construction and working of a transformer ratio arms bridge for the measurement of loss factor and capacitance.	6 Marks	L2	CO4	PO5
	b)	The capacitance and loss angle of the above specimen were measured using the same electrode set-up. The capacitance and tanδ with the specimen are 147 *p*F and 0.0012 respectively. The air capacitance of the electrode system was 35 *p*F. What is the dielectric constant and complex permittivity of bakelite?	6 Marks	L3	CO4	PO2
		(OR)				
10.		Describe the different electrical tests done on isolators and circuit breakers.	12 Marks	L1	CO4	PO5

CODE No.: 19BT60301 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

INDUSTRIAL ENGINEERING AND MANAGEMENT

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	Explain system approach to management.	12 Marks	L2	CO1	PO1
	(OR)				
2.	Describe in detail corporate governance.	12 Marks	L2	CO1	PO1 PO6

UNIT-II

3.	Discuss in detail Herzberg's Two-Factor motivation theory.	12 Marks	L2	CO2	PO1 PO2
	(OR)				
4.	Briefly explain the planning and implementing changes.	12 Marks	L2	CO2	PO1 PO2

UNIT-III

5.	List out the types of allowances and explain them.	12 Marks	L2	CO3	PO1 PO2 PO3
	(OR)				
6.	Find standard time for operations performed by drill man, if the work sampling shows that he was idle for 15% of the total working time of 8 hours, and for the remainder of the duty he worked at 110% performance index. He drilled 200 items of acceptable quality during his total duty. Assume that 10% of the total time is taken as fatigue and other personal allowances.	12 Marks	L3	CO3	PO1 PO2 PO3

UNIT-IV

7.	What are the types of maintenance and explain.	12 Marks	L2	CO4	PO1 PO2
	(OR)				
8.	A system has three units connected in series with MTBF values of 100, 300 and 400 hours respectively. Determine the following: i) The unit reliability of each component. ii) System reliability. iii) System MTBF for an operating period of 10 hours.	12 Marks	L3	CO4	PO1 PO2 PO3

UNIT-V

9.	Briefly explain industry safety rules and Indian factories act.	12 Marks	L2	CO5	PO1 PO2 PO3
	(OR)				
10.	The daily production in a machine shop is 1000 items. These items are inspected by 'GO' and 'NO GO gauge'. A sample of 100 is inspected daily for 10 days. The samples are taken at random. Compute the control limits for the 'p' chart and hence draw the 'p' chart.	12 Marks	L4	CO5	PO1 PO2 PO3

Day	1	2	3	4	5	6	7	8	9	10
Rejection	2	10	6	20	18	14	15	12	8	6

CODE No.: 19BT60302 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

DESIGN OF MACHINE ELEMENTS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

	UNIT-I				
1.	State and explain the applications of different theories of failure.	12 Marks	L2	CO1	PO1 PO2
	(OR)				
2.	A circular bar of 500mm length is supported freely at its two ends. It is acted upon by a central concentrated cyclic load having a minimum value of 20kN and a maximum value of 50kN. Determine the diameter of bar by taking a factor of safety of 1.5, size effect of 0.85, surface finish factor of 0.9. The material properties of bar is given by: ultimate strength of 650MPa, yield strength of 500MPa and endurance strength of 350MPa.	12 Marks	L3	CO1	PO1 PO2 PO3
	UNIT-II				
3.	Design a muff coupling to connect two steel shafts transmitting 25KW of power at 360RPM. The shaft and key are of same material with a yield tensile stress of 400MPa. The muff is made of cast iron with an ultimate tensile stress of 200 MPa. Factor of safety can be taken as 4.0 for all the stresses.	12 Marks	L3	CO2	PO1 PO2 PO3
	(OR)				
4.	Draw a knuckle joint and explain its design procedure.	12 Marks	L2	CO2	PO1 PO2
	UNIT-III				
5.	Design and draw a cast iron flange coupling for a mild steel shaft transmitting 90 kW at 250 r.p.m. The allowable shear stress in the shaft is 40 MPa and the angle of twist is not to exceed 1° in a length of 20 diameters. The allowable shear stress in the coupling bolts is 30 MPa.	12 Marks	L3	CO3	PO1 PO2 PO3
	(OR)				
6.	Design a knuckle joint for a tie rod of a circular section to sustain a maximum pull of 70 kN. The ultimate strength of the material of the rod against tearing is 420 MPa. The ultimate tensile and shearing strength of the pin material are 510 MPa and 396 MPa respectively. Determine the tie rod section and pin section. Take factor of safety = 6.	12 Marks	L3	CO3	PO1 PO2 PO3
	UNIT-IV				
7.	The ball bearings are to be selected for an application in which the radial load is 2000N during 90% of the time and 8000N during the remaining 10%. The shaft is to rotate at 150 r.p.m. Determine the minimum value of the basic dynamic load rating for 5000 hours of operation with not more than 10% failures.	12 Marks	L3	CO4	PO1 PO2 PO3

(OR)

8.	A 70mm long journal bearing supports a load of 2700N on a 40mm diameter shaft. The bearing has a radial clearance of 0.05mm and the viscosity of the oil is 0.021 kg/m-s at the operating temperature. If the bearing is capable of dissipating 80J/s, determine the maximum safe speed.	12 Marks	L3	CO4	PO1 PO2 PO3

UNIT-V

9.	Design a helical spring to support a tensile load of 6 kN and to have a stiffness of 100N/mm. the spring index is 6. The spring is made of steel having allowable stress of 300MPa. Take G=80GPa.	12 Marks	L3	CO5	PO1 PO2 PO3

(OR)

10.	Design a pair of spur gears to transmit 25kW at 1200 r.p.m to a parallel shaft to be rotated at 600 r.p.m. The center distance between shafts is 175mm.	12 Marks	L3	CO5	PO1 PO2 PO3

CODE No.: 19BT60303 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

HEAT TRANSFER

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.		A 0.8 m high and 1.5 m wide double pane window, consisting of two 4 mm thick layers of glass (k= 0.78 W/m.K), is separated by a 10 mm wide stagnant air space (k= 0.026 W/m.K). Determine the steady rate of heat transfer through this window; and the temperature of its inner surface for a day during which the room is maintained at 20 C, while the temperature of the outdoors is -10 C. Take the values of surface heat transfer coefficients for inner and outer surfaces of the window to be 10 W/m2. K and 40 W/m2. K, respectively.	12 Marks	L3	CO1	PO1 PO2 PO3
		(OR)				
2.		Define Critical thickness of insulation. Obtain an expression for critical radius of insulation for a spherical shell.	12 Marks	L3	CO1	PO1 PO2
		UNIT-II				
3.		Derive the expression Temperature distribution through an infinitely long rectangular fin by stating its assumptions.	12 Marks	L3	CO2	PO1 PO2
		(OR)				
4.		Fins, 12 in number, having K=75 W/m K and 0.75 mm thickness protrude 25mm from a cylindrical surface of 50mm diameter and 1m length placed in an atmosphere of 40^0C. If the cylindrical surface is maintained at 150^0C and the heat transfer coefficient is 23 W/m^2K Calculate: i) The rate of heat transfer ii) The percentage increase in heat transfer due to fins iii) The temperature at the centre of fins and iv) The fin efficiency and effectiveness.	12 Marks	L2	CO2	PO1
		UNIT-III				
5.	a)	Briefly explain the concept of heat transfer by free convection	6 Marks	L2	CO3	PO1
	b)	A horizontal plate 1 m X 0.8 m is kept in a water tank with the top surface at 60°C providing heat to warm stagnant water at 20°C. Determine the value of convection coefficient.	6 Marks	L3	CO3	PO1 PO2
		(OR)				
6.	a)	Water at 60^0C enters a tube of 2.54 cm diameter at a mean velocity of 2 cm/s. Calculate the exit water temperature if the tube is 3.0 m long and wall temperature is constant at 80^0C.	6 Marks	L3	CO3	PO1
	b)	Air at 20°C at atmospheric pressure flows over a flat plate at a velocity of 3m/s. if the plate is 1 m wide and 80°C, calculate the following at x = 300 mm. i) Hydrodynamic boundary layer thickness, ii) Thermal boundary layer thickness, iii) Local friction coefficient.	6 Marks	L3	CO3	PO1 PO2

UNIT-IV

7.	a)	A 4cm outer diameter, 1 m long tube is to be used to condense steam at atmospheric pressure. The water flows inside the tube maintaining the wall surface at 60^0C. Estimate the mass of condensate for the tube in horizontal position.	6 Marks	L3	CO4	PO1
	b)	In a counter flow double pipe heat exchanger with Water (Cp=4186) enters at 15°C, flowing at the rate of 1300kg/h. It is heated by oil (Cp=2000J/ kg K) flowing at the rate of 550kg/h from the inlet temperature of 94 °C. For an area of $1m^2$ and an overall heat transfer co-efficient of 1075 w/m^2K, determine the total heat transfer and the out let temperatures of water and oil	6 Marks	L3	CO4	PO1
		(OR)				
8.	a)	Water at atmospheric pressure is to be boiled in polished copper pan. The diameter of the pan is 350 mm and is kept at 115^0C. Calculate: i) power of the burner, ii) rate of evaporation in kg/h and iii) critical heat flux	6 Marks	L3	CO4	PO1
	b)	Oil with a specific heat of 2 KJ/ kg K is cooled from 110^0C to 70^0C by a flow of water flow in a counter flow heat exchanger. Water flows at the rate of 2 kg/sec and is heated from 35^0C to 65^0C. The overall heat transfer coefficient is estimated to be 0.37 KW/ m^2K. Determine the exit temperatures of oil and water, if the water flow rate drops to 1.5 kg / sec at the same oil flow rate.	6 Marks	L3	CO4	PO1 PO2

UNIT-V

9.	a)	A dead black cylinder of emissivity 0.95 is kept at 95°C in a large enclosure at 10°C. Find the radiation heat loss per square meter of its surface. What would be the radiation loss if the cylinder were surrounded by concentric cylinder with its inner surface having a brightly polished metal of emissivity 70.1?	6 Marks	L3	CO5	PO1
	b)	What is the shape factor with respect to itself if the surface is concave, convex or flat?	6 Marks	L3	CO5	PO1 PO2
		(OR)				
10.	a)	Discuss on shape factor algebra with simple sketches.	6 Marks	L3	CO5	PO1
	b)	The net radiation from the surfaces of two parallel plates maintained at temperatures, T1 and T2 is to be reduced by 79 times. Calculate the number screens to be placed between the two surfaces to achieve this reduction in heat exchange, assuming the emissivity of the screens as 0.05 and that of the surfaces as 0.8.	6 Marks	L3	CO5	PO1 PO2

CODE No.: 19BT60313 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

NON TRADITIONAL MACHINING PROCESSES

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	How the modern machining process classified based on source of energy, and shapes to be machined?	6 Marks	L2	CO1	PO1 PO2
	b)	Give specific applications for employing Chemical Machining process.	6 Marks	L2	CO1	PO1 PO2
		(OR)				
2.	a)	What are the various factors to be considered in the selection of Maskants for a particular application?	6 Marks	L2	CO1	PO1 PO2
	b)	Explain various process characteristics of chemical machining process.	6 Marks	L2	CO1	PO1 PO2
		UNIT-II				
3.	a)	What are the operations performed in ECM?	6 Marks	L2	CO2	PO1 PO2
	b)	Give some of the practical applications of chemical machining process.	6 Marks	L2	CO2	PO1 PO2
		(OR)				
4.	a)	What are the reactions possible in cathode (tool) and anode (work piece) in ECM process? (Assume electrolyte is NaCl)?	6 Marks	L2	CO2	PO1 PO2
	b)	List out the applications of electrochemical deburring process.	6 Marks	L2	CO2	PO1 PO2
		UNIT-III				
5.		With the aid of simple sketch, explain the working principle of WJM process. List the practical applications.	12 Marks	L2	CO3	PO1 PO2
		(OR)				
6.	a)	How is metal removed in abrasive jet machining process? Explain the mechanism with neat diagram.	6 Marks	L2	CO3	PO1 PO2
	b)	Explain the process elements of abrasive flow finishing process.	6 Marks	L2	CO3	PO1 PO2
		UNIT-IV				
7.		Name some of the dielectric fluids commonly used in EDM. Name some of the tool material used in EDM.	12 Marks	L2	CO4	PO1 PO2
		(OR)				
8.		Discuss the advantages of EDM as compared to other non traditional methods with regard to i) Metal removed rate ii) Accuracy and Surface finish.	12 Marks	L2	CO4	PO1 PO2
		UNIT-V				
9.		Distinguish between transferred and Non-transferred Arc type in PAM process based on principle, construction and working. List the advantages, limitations and practical application.	12 Marks	L2	CO5	PO1 PO2
		(OR)				
10.	a)	With the help of neat sketch explain the EBM process.	6 Marks	L2	CO5	PO1 PO2
	b)	Discuss the thermal features of LBM.	6 Marks	L2	CO5	PO1

CODE No.: 19BT60315 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

REFRIGERATION AND AIR CONDITIONING

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	A simple air cooled system is used for an aeroplane to take a load of 10 tons. Atmospheric temperature and pressure is 25°C and 0.9 atm respectively. Due to ramming the pressure of air is increased from 0.9 atm, to 1 atm. The pressure of air leaving the main compressor is 3.5 atm and its 50% heat is removed in the air-cooled heat exchanger and then it is passed through a evaporator for future cooling. The temperature of air is reduced by 10°C in the evaporator. Lastly the air is passed through cooling turbine and is supplied to the cooling cabin where the pressure is 1.03 atm. Assuming isentropic efficiency of the compressor and turbine are 75% and 70%, find : i) Power required to take the load in the cooling cabin. ii) COP of the system. The temperature of air leaving the cabin should not exceed 25°C.	6 Marks	L3	CO1	PO1 PO2 PO3
	b)	Define energy efficiency ratio of refrigeration system. How it is applicable for the refrigeration systems.	6 Marks	L2	CO1	PO1 PO2
		(OR)				
2.	a)	An air refrigerator working on the principle of Bell-Coleman cycle. The air into the compressor is at 1 atm at -10ºC. It is compressed to 10 atm and cooled to 40ºC at the same pressure. It is then expanded to 1 atm and discharged to take cooling load. The air circulation is 1 kg/s. The isentropic efficiency of the compressor = 80% The isentropic efficiency of the expander = 90% Find the following: i) Refrigeration capacity of the system ii) C.O.P of the system Take $\gamma = 1.4$, $C_p = 1.00$ kJ/kg ºC	6 Marks	L3	CO1	PO1 PO2 PO3
	b)	Illustrate the effect of liquid super heating on performance of the Vapor compression Refrigeration system.	6 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Discuss the working principle of tube in tube evaporator with a brief sketch.	6 Marks	L2	CO2	PO1
	b)	Explain construction and working of water cooled condenser with neat sketch.	6 Marks	L2	CO2	PO1

(OR)

4.	a)	Discuss the impact of refrigerants on environmental aspects.	6 Marks	L2	CO2	PO1 PO2 PO3 PO6 PO7
	b)	Illustrate the hydrocarbon refrigerants with some examples.	6 Marks	L2	CO2	PO1

UNIT-III

5.	a)	Illustrate the working principle of ammonia, water, and hydrogen refrigeration system with a neat sketch.	6 Marks	L2	CO3	PO1
	b)	Explain the principle of operation of four shell Li-Br vapor absorption refrigeration systems with a neat sketch.	6 Marks	L2	CO3	PO1

(OR)

6.	a)	Discuss the applications of steam jet refrigeration system.	6 Marks	L2	CO3	PO1
	b)	Illustrate the merits and demerits of thermoacoustic Refrigeration system.	6 Marks	L2	CO3	PO1

UNIT-IV

7.		An auditorium of 100 seating capacity of conditioned for the given specifications: Outdoor conditions – 35 ^{o} C and 65% RH Required air inlet conditions – 15 ^{o} C and 40 RH. The required condition is achieved first by cooling and dehumidifying and then by heating. Find the following: i) The capacity of the cooling coil in tons of refrigeration. ii) Capacity of the heating coil in kW. iii) By-pass factor of the heating coil if the surface temp of the coil is 22 ^{o} C.	12 Marks	L4	CO4	PO1 PO2 PO3

(OR)

8.	a)	Explain the procedure to draw a grand sensible heat factor line on a psychrometric chart. What do you understand by effective room sensible heat factor?	6 Marks	L2	CO4	PO1
	b)	Give the important characteristic features of adiabatic cooling and humidification process.	6 Marks	L2	CO4	PO1

UNIT-V

9.	a)	Discuss importance of comfort chart to design air conditioning system.	6 Marks	L2	CO5	PO1
	b)	What are the functions of a fan in an air conditioning system?	6 Marks	L2	CO5	PO1

(OR)

10.	a)	Describe the different methods of air conditioning duct design.	6 Marks	L2	CO5	PO1
	b)	Discuss the applications air – water heat pump circuits.	6 Marks	L2	CO5	PO1

❀ ❀ ❀

CODE No.: 19BT60317 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

HYDRAULICS AND PNEUMATICS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

	UNIT-I				
1.	Explain the working principle of following pumps with neat sketch. i) Lobe pump ii) External gear pump	12 Marks	L2	CO1	PO1
	(OR)				
2.	Explain the working principle following types of cylinders Single acting cylinder, double acting cylinder and double rod cylinder with applications.	12 Marks	L2	CO1	PO1
	UNIT-II				
3.	What are the methods of actuating direction control valve, explain the working of poppet valve with neat sketch.	12 Marks	L2	CO2	PO1
	(OR)				
4.	List and explain the components used in the hydraulic system, mention any six.	12 Marks	L2	CO2	PO1
	UNIT-III				
5.	Draw the ANSI symbols of any three types of flow lines and reservoirs used in hydraulic system.	12 Marks	L3	CO3	PO1
	(OR)				
6.	Explain and Design the hydraulic circuit for double acting cylinder with neat sketch.	12 Marks	L3	CO3	PO1
	UNIT-IV				
7.	Explain the following: i) 4/3- Direction Control Valve (7) ii) 3/2-DirectionControlValve iii) 4/2-DirectionControlValve iv) 2/2-DirectionControlValve	12 Marks	L2	CO3	PO1
	(OR)				
8.	Explain the following: i) Pneumatic circuit control single acting cylinder. ii) Air pilot control of double acting actuator.	12 Marks	L2	CO3	PO1
	UNIT-V				
9.	Explain about any three different position sensors with neat sketch.	12 Marks	L2	CO4	PO1
	(OR)				
10.	Design a pneumatic cylinder sequencing circuit using logics.	12 Marks	L3	CO4	PO1 PO2 PO3

CODE No.: 19BT60320 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

MECHATRONICS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

	UNIT-I				
1.	Taking an example explain sequential controller.	12 Marks	L2	CO1	PO1 PO2 PO3
	(OR)				
2.	With a block diagram explain the automatic camera operation.	12 Marks	L3	CO1	PO1 PO2 PO3
	UNIT-II				
3.	Explain: i) Poppet valve ii) Check valve	12 Marks	L2	CO2	PO1 PO2
	(OR)				
4.	Explain the types of cylinders used in linear actuators.	12 Marks	L3	CO2	PO1 PO2
	UNIT-III				
5.	Write note on belt drives.	12 Marks	L3	CO3	PO1 PO2 PO3
	(OR)				
6.	Write note on single phase and three phase induction motor.	12 Marks	L3	CO3	PO1 PO2 PO3
	UNIT-IV				
7.	Write note on Optical encoders.	12 Marks	L3	CO4	PO1 PO2 PO3
	(OR)				
8.	Explain any two types of pressure sensors.	12 Marks	L3	CO4	PO1 PO2 PO3
	UNIT-V				
9.	Explain DAC and ADC Systems.	12 Marks	L1	CO5	PO1 PO2
	(OR)				
10.	Explain PID controllers.	12 Marks	L2	CO5	PO1 PO2

CODE No.: 19BT60402 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

MICROCONTROLLERS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Contrast Microprocessors to microcontrollers.	6 Marks	L1	CO1	PO2
	b)	Illustrate 8051 Timer/counter control logic.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Bring out how addressing modes gives flexibility to program an 8051 microcontroller.	6 Marks	L2	CO1	PO2
	b)	Develop an ALP for 8051to move block of 'n' bytes from one Internal memory location to another internal memory location.	6 Marks	L4	CO1	PO2
		UNIT-II				
3.	a)	Present PIC18F452 Memory organization in detail.	6 Marks	L1	CO2	PO1
	b)	Analyze PIC18F452 Instruction set classes with relevant examples.	6 Marks	L2	CO2	PO2
		(OR)				
4.	a)	Compose an ALP to convert packed BCD bytes to ASCII for PIC18F452.	6 Marks	L4	CO2	PO2
	b)	Reproduce and paraphrase PIC18F internal hardware structure.	6 Marks	L1	CO2	PO1
		UNIT-III				
5.	a)	Present PIC18F452 pin details.	6 Marks	L1	CO3	PO1
	b)	Evaluate PIC18F452 I/O PORT programming concepts.	6 Marks	L3	CO3	PO2
		(OR)				
6.	a)	Illustrate PIC18F452 Timer0 Structure.	6 Marks	L3	CO3	PO2
	b)	Characterize how Timer in PIC18F can be deployed for counting applications with suitable support.	6 Marks	L3	CO3	PO2
		UNIT-IV				
7.	a)	Specify how Serial Port in PIC18F452 can be programmed for transmitting a byte.	6 Marks	L2	CO4	PO3
	b)	Detail out support for RS232 connections for PIC18F452.	6 Marks	L1	CO4	PO6
		(OR)				
8.	a)	Program how Serial interrupt can be enabled and used in PIC18F452.	6 Marks	L3	CO4	PO6
	b)	Discuss various sources of interrupts for PIC18F.	6 Marks	L1	CO4	PO2
		UNIT-V				
9.	a)	Describe how the Seven segment LED display can be interfaced with PIC18.	6 Marks	L1	CO4	PO3
	b)	Detail out how DC motor speed can be controlled using PWM module on PIC18.	6 Marks	L3	CO4	PO8
		(OR)				
10.	a)	Illustrate the need and method to interface ADC to PIC18.	6 Marks	L2	CO4	PO4
	b)	Plan how Keyboard can be interfaced with PIC18.	6 Marks	L1	CO4	PO6

CODE No.: 19BT60405 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

DIGITAL IC DESIGN

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Identify the difference between static and dynamic logic.	5 Marks	L2	CO1	PO1
	b)	Analyze the characteristics of Propagation delay in complementary CMOS gates.	7 Marks	L4	CO1	PO2
		(OR)				
2.	a)	Explain in detail about NORA Logic and Domino logic.	5 Marks	L3	CO1	PO1
	b)	Construct Four input CMOS NAND gate and its RC model.	7 Marks	L4	CO1	PO3
		UNIT-II				
3.	a)	Describe about Clock skew and clock generation in sequential circuits.	6 Marks	L3	CO2	PO5
	b)	Analyze the operation of sense Amplifier based registers.	6 Marks	L1	CO1	PO1
		(OR)				
4.	a)	Design NORA CMOS logic style using C^2 MOS pipelined structure.	6 Marks	L2	CO1	PO2
	b)	Explain in detail True single –Phase clocked register using a single clock technique.	6 Marks	L3	CO2	PO3
		UNIT-III				
5.	a)	Classify methods of logical effort for transistor sizing.	5 Marks	L3	CO3	PO2
	b)	Construct and explain read write operation of Three transistor Dynamic RAM technique.	7 Marks	L1	CO3	PO3
		(OR)				
6.	a)	Write short notes about power consumption in CMOS gates.	5 Marks	L2	CO3	PO2
	b)	Demonstrate the logic circuit of a basic RAM cell.	7 Marks	L3	CO3	PO3
		UNIT-IV				
7.	a)	Analyze the ALU functions in Adders and Multipliers.	5 Marks	L4	CO3	PO3
	b)	Explain general arrangement of 4 bit Arithmetic processor.	7 Marks	L2	CO3	PO1
		(OR)				
8.	a)	Design 4 bit shifter with suitable considerations.	6 Marks	L2	CO3	PO2
	b)	Implement ALU functions with modified booths algorithm.	6 Marks	L3	CO3	PO4
		UNIT-V				
9.	a)	Summarize standard cell design methodology.	5 Marks	L1	CO4	PO1
	b)	Develop flow chart for Physical design flow and explain the significance of each block.	7 Marks	L3	CO4	PO7
		(OR)				
10.	a)	Develop flow chart for ASIC Design Flow.	6 Marks	L1	CO4	PO7
	b)	Sketch the block diagram of a typical standard cell floor plan.	6 Marks	L2	CO4	PO1

❀ ❀ ❀

CODE No.: 19BT60406 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

SATELLITE COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Discuss the frequency allocations and few applications of satellites.	6 Marks	L1	CO1	PO1
	b)	Draw the geometry of a geostationary link showing elevation, azimuth and Range and explain how range can be calculated.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	List the various launch vehicles and techniques used for launching a satellite and explain them briefly.	6 Marks	L1	CO1	PO2
	b)	A geostationary satellite moving in an equatorial orbit is at a height of 35,786Km from the earth's surface. If the earth radius is taken as 6,378 Km, determine the theoretically feasible maximum coverage angle and maximum slant range.	6 Marks	L3	CO1	PO4
		UNIT-II				
3.	a)	Derive an equation for Free space path loss for a satellite system and explain the significance of it during satellite up-link and down-link design.	6 Marks	L2	CO2	PO2
	b)	Show the uplink and down link model for designing a satellite system for a specified C/N ratio and explain the procedure.	6 Marks	L2	CO2	PO8
		(OR)				
4.	a)	Discuss the Telemetry, Tracking, Command and Monitoring subsystem in detail for a satellite system.	6 Marks	L1	CO2	PO1
	b)	Design a satellite system for an EIRP of 100 dBW, a carrier frequency of 10 GHz and the distance between earth station and satellite of 36000Km. Calculate the CNR in 10MHz bandwidth if the ground station G/T is 20 dB/K.	6 Marks	L3	CO2	PO3
		UNIT-III				
5.	a)	Describe TDMA frame structure with a neat block diagram.	6 Marks	L1	CO3	PO1
	b)	Compare FDMA and TDMA systems performance with relevant examples.	6 Marks	L2	CO3	PO2
		(OR)				
6.	a)	List the various types of antennas used in satellite Earth Station design.	6 Marks	L1	CO3	PO1
	b)	Illustrate how unique word correlator is designed and used as a time marker for earth station transmission in TDMA technique.	6 Marks	L2	CO3	PO5
		UNIT-IV				
7.		List and analyze the various operational NGSO Constellation designs used in satellite communications and explain any two in detail.	12 Marks	L4	CO4	PO6

(OR)

8.	a)	Discuss Delay and Throughput considerations in a satellite system.	6 Marks	L2	CO4	PO2
	b)	Discuss about the radiation effects in satellite systems and its components. What are the standards that have to be followed?	6 Marks	L2	CO4	PO6

UNIT-V

9.	a)	List few applications of Global Positioning System.	6 Marks	L1	CO5	PO1
	b)	Explain the principle and operation and techniques used for GPS system and tracking.	6 Marks	L2	CO5	PO2

(OR)

10.	a)	List the advantages and applications of GPS Aided Geo Augmented Navigation.	6 Marks	L2	CO5	PO2
	b)	Explain briefly about IRNSS system, its necessity and sustainability in India.	6 Marks	L1	CO5	PO7

CODE No.: 19BT60407 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

IMAGE PROCESSING

[Electrical and Electronics Engineering, Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Derive the Walsh transform kernel for N=4.	6 Marks	L3	CO1	PO5
	b)	If an image A= [5 3 4 ;6 8 7; 4 7 9] & B= [1 4 5; 8 3 6; 2 4 0] Perform Arithmetic operations on the two images A & B.	6 Marks	L4	CO1	PO4
		(OR)				
2.	a)	Develop the steps involved in sampling and quantization of an image.	6 Marks	L2	CO1	PO1
	b)	If an image A=[1 0 1 ;1 1 0; 0 1 1] & B= [0 1 1; 0 0 1; 1 1 0] Perform any four Logical operations on the two images A & B.	6 Marks	L4	CO1	PO4

UNIT-II

3.	a)	Give the expression for 2-D Butterworth Low pass filter transfer function and sketch it.	7 Marks	L2	CO2	PO3
	b)	Differentiate between spatial and frequency domain methods.	5 Marks	L2	CO2	PO2
		(OR)				
4.	a)	What is meant by image enhancement? Explain about the i) Gray level slicing ii) Bit plane slicing	6 Marks	L2	CO2	PO1
	b)	Write the different masks used for calculating first and second order derivatives for sharpening an image.	6 Marks	L3	CO2	PO5

UNIT-III

5.	a)	With neat diagram explain the image degradation model.	4 Marks	L2	CO3	PO1
	b)	List the algebraic approaches of restoration and explain anyone.	8 Marks	L2	CO3	PO1
		(OR)				
6.	a)	What type of Algorithm used in filters to estimate the Degradation function?	6 Marks	L2	CO3	PO2
	b)	Derive the constrained least squares filtering to remove noise and blurring in an image?	6 Marks	L2	CO3	PO2

UNIT-IV

7.	a)	What is the need of Fidelity Criteria in Modern image Compression?	6 Marks	L2	CO4	PO2
	b)	Analyze the various steps involved in functioning of source encoder and decoder in image compression.	6 Marks	L3	CO4	PO3
		(OR)				

8.	a)	Write the need for image compression? List and explain different redundancies in an image.	6 Marks	L2	CO4	PO2
	b)	Discuss about bit plane coding in Image Processing.	6 Marks	L2	CO4	PO1

UNIT-V

9.	a)	Write a short note on region-based Segmentation	5 Marks	L2	CO5	PO1
	b)	Explain how to convert given image from RGB to HSV with an example.	7 Marks	L2	CO6	PO2
		(OR)				
10.	a)	Define thresholding and explain about global thresholding.	7 Marks	L2	CO5	PO1
	b)	Convert the given RGB image into CMYK.	5 Marks	L3	CO6	PO2

$$X = \begin{bmatrix} \{22 & 32 & 42\} & \{36 & 49 & 58\} \\ \{45 & 56 & 78\} & \{67 & 76 & 89\} \end{bmatrix}.$$

CODE No.: 19BT60408 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

NANOSTRUCTURES AND NANOTECHNOLOGY

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Recall Gleiter's definition of size effects.	5 Marks	L1	CO1	PO1
	b)	Outline intrinsic and extrinsic size effects. Give an example.	7 Marks	L2	CO1	PO1
		(OR)				
2.		Outline the Instability of 3D0 NSM due to grain growth.	12 Marks	L2	CO1	PO1
		UNIT-II				
3.		Examine the principal working and application of Transmission electron microscopy (TEM) for the characterization of nano materials.	12 Marks	L4	CO1	PO1
		(OR)				
4.	a)	Identify the role of nano scale dimension on the structural and mechanical properties of materials.	6 Marks	L3	CO1	PO1
	b)	Solve the challenges in detecting an extremely low concentration in solid using Secondary Ion Mass Spectrometry (SIMS) methods.	6 Marks	L3	CO1	PO1
		UNIT-III				
5.		Recall how a variety of tip sample interactions may be measured by an AFM, depending on the separation.	12 Marks	L1	CO2	PO5
		(OR)				
6.	a)	Summarize the basic working principle of Focused ion beam (FIB) lithographic technique.	6 Marks	L2	CO2	PO5
	b)	Analyze the two possible mechanisms proposed to explain the enhanced strength of nano wires or nano rods.	6 Marks	L4	CO2	PO2
		UNIT-IV				
7.	a)	Express the different Growth Mechanisms and their self-termination growth mechanisms of CNT.	6 Marks	L2	CO3	PO1
	b)	Summarize the two operation modes that are commonly used in scanning tunneling microscope.	6 Marks	L2	CO3	PO1
		(OR)				
8.		Characterize the Electrical, Thermal, and Mechanical Properties of carbon nano tube.	12 Marks	L4	CO3	PO1
		UNIT-V				
9.	a)	Design and develop nano bots and its applications nano device for biomedical application.	6 Marks	L3	CO4	PO3
	b)	Analyze the concept of Quantum dots and their use in lasers and detectors.	6 Marks	L4	CO4	PO6
		(OR)				
10.	a)	Recall the sustainability of gold nano particles for its excellent catalytic properties.	6 Marks	L2	CO4	PO7
	b)	Explain the challenges in lower threshold current and lower spectra width with Quantum well lasers.	6 Marks	L2	CO4	PO4

CODE No.: 19BT60502 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

MACHINE LEARNING

[Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Investigate the different perspectives and issues in Machine Learning.	6 Marks	L4	CO2	PO2
	b)	Illustrate the General-to-Specific Ordering of Hypotheses using example hypotheses.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	Write the algorithm for the Finding A Maximally Specific Hypothesis.	6 Marks	L3	CO3	PO1
	b)	Explain the simple learning algorithm to represent the version space.	6 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Information gain measures the expected reduction in entropy. Justify.	6 Marks	L4	CO2	PO2
	b)	Illustrate the operations of ID3 algorithm with an example.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Explain the hypothesis space search in Decision tree learning.	6 Marks	L2	CO1	PO2
	b)	Analyze the use of kernels in SVM and which kernel can be used in the case of non-linear data.	6 Marks	L4	CO2	PO2

UNIT-III

5.	a)	Investigate the advantage of gradient descent rule over the perception training rule.	6 Marks	L4	CO4	PO3
	b)	Find the stochastic approximation to gradient descent rule and explain.	6 Marks	L3	CO4	PO2
		(OR)				
6.	a)	Derive the gradient descent training rule and explain the steps with necessary equations.	6 Marks	L3	CO4	PO3
	b)	Explain the architecture of a typical multilayer neural network and illustrate its decision surface.	6 Marks	L2	CO4	PO2

UNIT-IV

7.	a)	Discuss in detail about maximum likelihood hypotheses for predicting probabilities.	6 Marks	L2	CO2	PO2
	b)	Apply the MDL principle to the problem of learning decision trees. Explain in detail.	6 Marks	L3	CO2	PO2
		(OR)				
8.	a)	Explain the Bayes optimal classification process in detail.	6 Marks	L2	CO2	PO2
	b)	Analyze the drawback of Bayes Optimal Classifier and advantage of Gibbs algorithm.	6 Marks	L4	CO3	PO3

UNIT-V

9.	a)	Discuss in detail about the locally weighted linear regression algorithm.	6 Marks	L2	CO2	PO2
	b)	Write a short note on the Radial Basis Functions.	6 Marks	L2	CO2	PO2
		(OR)				
10.	a)	Analyze the various remarks on the k-nearest neighbor algorithm.	6 Marks	L4	CO2	PO2
	b)	Describe the learning task in reinforcement learning process.	6 Marks	L2	CO2	PO2

CODE No.: 19BT60503 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

CRYPTOGRAPHY AND NETWORK SECURITY

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Apply network security model in business organizations.	6 Marks	L3	CO1	PO8
	b)	Explain the following substitution techniques with example. i) Monoalphabetic Cipher ii) Caesar Cipher	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Convert "attack postponed until two am" using transposition technique with the key "4317256".	6 Marks	L3	CO1	PO2
	b)	Mention Responsibilities of security mechanisms.	6 Marks	L4	CO1	PO8
		UNIT-II				
3.	a)	State the purpose of the S-boxes in DES.	6 Marks	L3	CO1	PO4
	b)	Write short notes about the following block cipher modes of operations. i) Cipher Block chaining method ii) Counter mode	6 Marks	L2	CO1	PO2
		(OR)				
4.	a)	Distinguish between a block cipher and a stream cipher.	6 Marks	L2	CO1	PO1
	b)	Describe in detail the key generation in AES algorithm and its expansion format.	6 Marks	L4	CO1	PO2
		UNIT-III				
5.	a)	Explain the Schnorr Digital Signature Scheme in detail.	6 Marks	L2	CO2	PO1
	b)	List and explain the approaches to attack the RSA algorithm.	6 Marks	L4	CO2	PO4
		(OR)				
6.	a)	Differentiate a message authentication code and a one-way hash function.	6 Marks	L2	CO2	PO2
	b)	Explain in detail El Gamal Public key cryptosystem.	6 Marks	L2	CO2	PO2
		UNIT-IV				
7.	a)	Explain the format of the X.509 certificate.	6 Marks	L2	CO3	PO1
	b)	What is Kerberos? Explain how it provides authenticated service.	6 Marks	L4	CO3	PO2
		(OR)				
8.	a)	Explain public-key Authority in distribution of public keys.	6 Marks	L3	CO3	PO2
	b)	Discuss PIV System Model in Personal Identity Verification.	6 Marks	L3	CO3	PO2
		UNIT-V				
9.	a)	Write down the functions provided by S/MIME.	6 Marks	L2	CO4	PO2
	b)	Explain the architecture of IP Security.	6 Marks	L3	C04	PO1
		(OR)				
10.	a)	Differentiate between transport modes vs. tunnel mode encryption in IPsec.	6 Marks	L2	C04	PO2
	b)	Discuss the various web security requirements.	6 Marks	L4	C04	PO2

❀ ❀ ❀

CODE No.: 19BT61001 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

PROCESS CONTROL INSTRUMENTATION

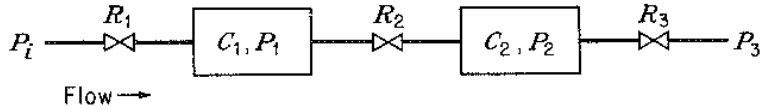
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Evaluate the transfer function of two single capacity systems are connected in none interacting.	6 Marks	L1	CO1	PO4
	b)	List the elements of process dynamics.	6 Marks	L3	CO1	PO1
		(OR)				
2.	a)	Define degrees of freedom. Illustrate with an example.	6 Marks	L2	CO1	PO2
	b)	Determine the effective time constants for an interacting flow system shown in figure, which has two equal capacities and three equal resistances.	6 Marks	L2	CO1	PO3



UNIT-II

3.	a)	Illustrate how a two position control will work.	6 Marks	L2	CO1	PO2
	b)	A liquid-level control system linearly converts a displacement of 2 to 3m into a 4 to 20mA control signal. A relay serves as the two-position controller to open or close an inlet valve. The relay closes at 12mA and opens at 10mA. Find i) The relation between displacement level and current. ii) The neutral zone or displacement gap in meters.	6 Marks	L2	CO1	PO4
		(OR)				
4.	a)	Illustrate how a multi position control will work. Also sketch the controller output for an input error signal.	6 Marks	L2	CO1	PO2
	b)	What is an offset error? How to minimize the offset error in proportional controller?	6 Marks	L3	CO1	PO1

UNIT-III

5.	a)	In an application of the closed loop Ziegler-Nichols method, a process begins oscillation with a 30% proportional band in an 11.5 min period. Find the nominal three-mode controller settings.	6 Marks	L2	CO2	PO4
	b)	Explain the Cohen-Coon method to determine the controller parameters.	6 Marks	L2	CO2	PO1
		(OR)				
6.	a)	Explain the Ziegler Nichols open loop method.	6 Marks	L3	CO2	PO2
	b)	Explain the procedure to determine the controller parameters using Ziegler Nichols closed loop method.	6 Marks	L2	CO2	PO1

UNIT-IV

7.	a)	Whether the solenoid is an actuator or not? Justify with an operation.	6 Marks	L3	CO3	PO2
	b)	Sketch the flow-lift characteristics of control valves.	6 Marks	L2	CO3	PO1

(OR)

8.	a)	Identify the forces acting on the spring actuator? Explain briefly.	6 Marks	L3	CO3	PO5
	b)	Flow through a linear valve is given by $\frac{m}{M} = \frac{1}{R}\left[1 + (R - 1)\frac{x}{X}\right]$. Compute the valve sensitivity if the valve passes 20gpm at a maximum lift of 25cm and the rangeability is 30.	6 Marks	L1	CO3	PO4

UNIT-V

9.	a)	Explain how the closed loop performance of the system can be improved by applying the cascade control concept.	6 Marks	L2	CO4	PO1
	b)	Compare and contrast the feedback and feed forward control systems with applications.	6 Marks	L3	CO4	PO2

(OR)

10.	a)	Explain the practical aspects of designing a feed forward controllers.	6 Marks	L2	CO4	PO1
	b)	What is distillation column? Explain with a neat diagram.	6 Marks	L2	CO4	PO2

CODE No.: 19BT61002 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

ANALYTICAL INSTRUMENTATION

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Specify the purpose of pH measurement. Discuss the working of direct-reading type pH meter with temperature compensation arrangement	6 Marks	L1	CO1	PO2
	b)	List the gas analyzers used in industries and with a neat sketch explain the working of silica analyzer in detail.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Analyze the hydrogen concentration by using hydrogen analyzer.	6 Marks	L3	CO1	PO2
	b)	Define ion selective electrode. Identify and analyze a suitable electrode to determine the ammonia concentration present in a sample.	6 Marks	L3	CO1	PO2
		UNIT-II				
3.	a)	List the characteristics of detection systems used in gas chromatography. Explain flame ionization detector that is used in gas chromatography.	6 Marks	L2	CO2	PO1
	b)	Draw chromatogram and interpret how the chromatography separates the compounds from the sample mixture.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Classify liquid chromatography and explain columns used in liquid chromatography in detail.	6 Marks	L2	CO2	PO1
	b)	Specify the purpose of detection system and discuss any one detection system that is used with liquid chromatography.	6 Marks	L2	CO2	PO1
		UNIT-III				
5.	a)	Differentiate single beam and double beam spectrometers.	6 Marks	L2	CO2	PO1
	b)	Explain how beer Lambert's law is implemented in the analysis of chemical solution by using spectrometers.	6 Marks	L2	CO2	PO1
		(OR)				
6.	a)	Elaborate an appropriate spectroscopic technique to analyze the given chemical solution by using colorimeter.	6 Marks	L3	CO2	PO1
	b)	Draw the block diagram of FTIR spectrophotometer and illustrate the analysis of biological fluids with an example.	6 Marks	L2	CO2	PO6
		UNIT-IV				
7.	a)	Compare continuous-wave NMR spectrometer and pulsed Fourier Transform NMR spectrometer with respect to working principle.	6 Marks	L2	CO2	PO1
	b)	Select an appropriate spectroscopic technique to analyze given chemical sample by using magnetic resonance phenomenon.	6 Marks	L2	CO2	PO1

(OR)

8.	a)	Identify and analyze a suitable instrument that uses flame as light source to determine the concentration of Na present in Nacl solution.	6 Marks	L2	CO2	PO6
	b)	Explain the necessity of X- ray detectors in day today life. Discuss the instrumentation for x-ray spectrometers in detail with the help of block diagram.	6 Marks	L2	CO2	PO1

UNIT-V

9.	a)	Compare GM counter and proportional counter with respect to working principle.	6 Marks	L2	CO3	PO1
	b)	Discuss the safety measures in industrial power plants. Analyze ionizing radiations that are emitted from the nuclear power plants by using an ionization chamber.	6 Marks	L3	CO3	PO7

(OR)

10.	a)	Explain how environmental pollution monitoring devices that provides environmental safety.	6 Marks	L2	CO4	PO5
	b)	Analyze NO_X concentration present in a sample by identifying the suitable techniques that meet industrial safety.	6 Marks	L2	CO4	PO2

CODE No.: 19BT61004 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

POWER PLANT INSTRUMENTATION

[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Define co-generation. Explain the topping cycle and bottom cycle operation of co-generation cycle.	6 Marks	L1	CO1	PO1
	b)	With a schematic diagram, explain various operations involved in hydro power plants.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Justify the role of instrumentation in thermal power plants.	6 Marks	L2	CO1	PO2
	b)	With the aid of block diagram, describe the operation of solar power plant.	6 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Design a measuring system to measured drum water level in power plant.	6 Marks	L3	CO2	PO4
	b)	Analyze the methods of measuring steam flow in power plants.	6 Marks	L2	CO2	PO2
		(OR)				
4.	a)	With neat sketch, illustrate the working of flue gas analyzer.	6 Marks	L2	CO2	PO1
	b)	Analyze the various methods of water flow measurement in power plants.	6 Marks	L3	CO2	PO2
		UNIT-III				
5.	a)	Recall the difference between feed forward and feedback steam temperature control.	6 Marks	L2	CO3	PO1
	b)	Provide an engineering solution to control cascade steam temperature in water circuit.	6 Marks	L3	CO3	PO3
		(OR)				
6.	a)	Name different Principle parts of steam turbine and explain each in detail.	6 Marks	L2	CO3	PO1
	b)	Compare fireside with waterside control mechanisms for control of steam temperature in boiler.	6 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	Classify steam turbines. Explain any two methods in detail.	6 Marks	L2	CO4	PO1
	b)	Select an appropriate technique for controlling automatic load frequency control.	6 Marks	L3	CO4	PO4
		(OR)				
8.	a)	Compare impulse turbine with reaction turbine.	6 Marks	L2	CO4	PO1
	b)	Explain about free governor mode operation in detail.	6 Marks	L1	CO4	PO1
		UNIT-V				
9.	a)	Discuss in detail about interlocks for boiler operation.	6 Marks	L2	CO5	PO1
	b)	Specify the importance of electrical safety and maintenance of measuring instruments in power plants.	6 Marks	L3	CO5	PO6
		(OR)				
10.	a)	List the types of maintenance in power plants and explain each in detail.	6 Marks	L2	CO5	PO1
	b)	Discuss about explosion hazards and intrinsic safety.	6 Marks	L2	CO5	PO5

CODE No.: 19BT61502 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

INFORMATION SECURITY
[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the security mechanisms of X.800 and security standards.	6 Marks	L2	CO1	PO1
	b)	Explain the different types of flodding_based DDoS attacks.	6 Marks	L2	CO2	PO1
		(OR)				
2.	a)	Explain the significance of the Handshake protocol of the SSL.	6 Marks	L2	CO1	PO1
	b)	Discuss the role of compression in the operation of a virus?	6 Marks	L2	CO2	PO1
		UNIT-II				
3.	a)	Explain about the SSL Handshake protocol message types and its parameters.	6 Marks	L2	CO3	PO1
	b)	Explain the IEEE 802.11 Protocol Stack and the services provided by it.	6 Marks	L2	CO3	PO1
		(OR)				
4.	a)	Explain the channel mechanism procedure in User Authentication Protocol.	6 Marks	L4	CO3	PO2
	b)	Explain the IEEE protocol architecture with a neat sketch.	6 Marks	L2	CO3	PO3
		UNIT-III				
5.	a)	Discuss with an example the message format of MIME.	6 Marks	L4	CO4	PO2
	b)	What are the advantages of the Oakley key determination protocol and ISAKMP in IPsec?	6 Marks	L4	CO4	PO2
		(OR)				
6.	a)	Briefly explain the five principal services provided by PGP.	6 Marks	L2	CO4	PO5
	b)	Explain the processing model for Outbound Packets of IPSec processing.	6 Marks	L2	CO4	PO5
		UNIT-IV				
7.	a)	Classify different types of intruders and their patterns of behaviour with examples.	6 Marks	L4	CO5	PO2
	b)	Write short notes on the following: i) application-level gateway ii) circuit-level gateway?	6 Marks	L2	CO5	PO1
		(OR)				
8.	a)	Write a short note on the Statistical Anomaly Detection of intrusion detection techniques.	6 Marks	L2	CO5	PO5
	b)	What are the common characteristics of a bastion host?	6 Marks	L2	CO5	PO2
		UNIT-V				
9.	a)	How Tor is used for anonymize SSH connections.	6 Marks	L4	CO6	PO2
	b)	Explain the installation procedure of SpoofGuard.	6 Marks	L4	CO6	PO2
		(OR)				
10.	a)	Discuss the tools used to protect the data privacy with fewer passwords.	6 Marks	L2	CO6	PO5
	b)	How to set up GPG with Apple's Mail.app included with Mac OS X.	6 Marks	L4	CO6	PO2

❀ ❀ ❀

CODE No.: 19BT71203 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech II Semester (SVEC-19) Supplementary Examinations, December – 2022

BIG DATA TECHNOLOGIES

[Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Illustrate the structure and Characteristics of Big Data.	6 Marks	L3	CO1	PO1
	b)	List out the applications and Tools of Big Data.	6 Marks	L1	CO1	PO2
		(OR)				
2.	a)	Differentiate between Hadoop and RDBMS.	6 Marks	L4	CO1	PO2
	b)	Explain about Hadoop latest Five Releases.	6 Marks	L4	CO1	PO2 PO5
		UNIT-II				
3.	a)	Explain data Flow and Hadoop Archives in HDFS.	6 Marks	L2	CO1	PO1
	b)	Explain Serialization, File-Based Data Structures in Hadoop I/O.	6 Marks	L4	CO1	PO2
		(OR)				
4.	a)	Explain Building Blocks of HDFS.	6 Marks	L2	CO1	PO2
	b)	List out the Concept in Hadoop I/O and HDFS.	6 Marks	L1	CO1	PO1
		UNIT-III				
5.	a)	Explain counters and joins in Map Reduce features.	6 Marks	L4	CO2	PO1
	b)	List out different types Input and output formats of Map Reduce.	6 Marks	L1	CO2	PO2
		(OR)				
6.	a)	Discuss Scaling out and Hadoop pipes in Map Reduce.	6 Marks	L3	CO2	PO2
	b)	Explain Map Reduce Architecture and Demonstrate Map Reduce word count Process with an example.	6 Marks	L3	CO3	PO3 PO4
		UNIT-IV				
7.	a)	Distinguish between HBase vs. RDBMS.	6 Marks	L4	CO3	PO2
	b)	Explain User-defined functions in Hive with Examples.	6 Marks	L4	CO3	PO1
		(OR)				
8.	a)	Demonstrate the basic concepts of Praxis.	6 Marks	L2	CO3	PO2
	b)	Explain Data processing Operators of PIG with an Example.	6 Marks	L4	CO3	PO3 PO4
		UNIT-V				
9.	a)	Describe Sqoop working with Database Imports, working with Imported Data, Importing Large Objects.	6 Marks	L1	CO4	PO5
	b)	Explain Building applications with Zookeeper.	6 Marks	L4	CO4	PO8
		(OR)				
10.	a)	Write Hive steps for creating a WhatsApp Database.	6 Marks	L4	CO3	PO8
	b)	Elaborate procedure of Facebook data processing in PIG environment.	6 Marks	L4	CO3	PO8

❀ ❀ ❀

CODE No.: 19MT25701 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.Tech II Semester (SVEC-19) Regular/Supplementary Examinations October - 2022

NANO MATERIALS AND NANOTECHNOLOGY

[V L S I]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Recall Gleiter's definition of size effects.	5 Marks	L1	CO1	PO1
	b)	Classify the intrinsic and extrinsic size effects with an example.	7 Marks	L2	CO1	PO1
		(OR)				
2.		Extrapolate a formula for classification of nanostructures by dimensionality.	12 Marks	L3	CO1	PO1
		UNIT-II				
3.		Explain the working principle and application of scanning electron microscopy for the characterization of nano materials.	12 Marks	L2	CO1	PO1
		(OR)				
4.	a)	Identify the influence of nano scale dimension on the structural and optical properties of materials.	6 Marks	L3	CO1	PO1
	b)	A ZnO crystallite is having a shape factor of 0.9. Apply an appropriate formula to estimate the mean size of ZnOnanocrystallites (nm). (Given, 1.54060 Å is the X-ray wavelength, 0.5 angle (θ) is the full width at half the maximum (FWHM) of the X-ray diffraction peak and the Braggs' angle is 10 deg.)	6 Marks	L3	CO1	PO1
		UNIT-III				
5.		Explain the working principle, application and advantages of Microsystems.	12 Marks	L2	CO2	PO1
		(OR)				
6.	a)	Illustrate different micromachining techniques used in MEMS.	6 Marks	L2	CO2	PO3
	b)	Analyze the concept MEMS & NEMS and compare with respect to their design and applications.	6 Marks	L4	CO2	PO2
		UNIT-IV				
7.	a)	Interpret different properties of CNT based on chiral indices (n, m).	6 Marks	L2	CO3	PO1
	b)	Develop the flowchart of Chemical Vapor Deposition of Carbon Nanotubes.	6 Marks	L3	CO3	PO1
		(OR)				
8.		Analyze the present reflection on the development of multidisciplinary research on Carbon Nanotubes (CNTs).	12 Marks	L4	CO3	PO1
		UNIT-V				
9.		Develop a Nanodevice for advanced technological application.	12 Marks	L3	CO4	PO2
		(OR)				
10.	a)	Illustrate Applications of Nanoparticles in Biological field.	6 Marks	L2	CO4	PO1
	b)	Explain synthetic tailoring of band gaps in quantum devices.	6 Marks	L2	CO4	PO1

CODE No.: 19MT25702 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.Tech II Semester (SVEC-19) Regular/Supplementary Examinations October - 2022

PHYSICAL DESIGN AUTOMATION

[V L S I]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain in detail about computational complexity and its classes.	8 Marks	L2	CO1	PO1
	b)	List out the three ways of verification methods before fabrication process and explain in brief.	4 Marks	L1	CO1	PO1
		(OR)				
2.		Develop the Pseudo code description of Prim's minimum spanning tree algorithm and explain in detail.	12 Marks	L3	CO1	PO2
		UNIT-II				
3.	a)	List out the minimum distance design rules and explain the rules with help of lambda grid.	6 Marks	L1	CO1	PO1
	b)	Develop the symbolic layout of a CMOS Inverter by using layout design rules and explain in brief about its geometric layers.	6 Marks	L3	CO1	PO2
		(OR)				
4.	a)	Develop the pseudo code for constructive placement algorithm using **while** , **if** and **cost** as attributes	4 Marks	L3	CO1	PO2
	b)	Apply constructive placement algorithm on any cluster of cells and analyze its computations.	8 Marks	L3	CO1	PO3
		UNIT-III				
5.	a)	Discuss the following : i) Signal modeling. ii) Gate modeling. iii) Delay modeling.	8 Marks	L2	CO2	PO1
	b)	Compare compiler-driven and event-driven simulation.	4 Marks	L2	CO2	PO1
		(OR)				
6.		Explain in detail about ROBDD Manipulation with an example.	12 Marks	L2	CO2	PO1
		UNIT-IV				
7.	a)	Name the special conditional nodes and explain in detail with neat sketch.	6 Marks	L1	CO2	PO1

	b)	Construct two different DFGs for below given if else statements using conditional nodes and explain in detail.
		if (a > b)
		c ——a – b ;
		else
		c ——b – a ;
			6 Marks	L3	CO2	PO2

		(OR)				
8.		Summarize the Force-directed scheduling algorithm with suitable example.	12 Marks	L2	CO2	PO1
		UNIT-V				
9.		Describe the FPGA routing algorithm for non-segmented model with necessary illustrations.	12 Marks	L2	CO3	PO1
		(OR)				
10		Explain in detail about MCM technologies with neat sketch.	12 Marks	L2	CO3	PO1

.

CODE No.: 19MT25705 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.Tech II Semester (SVEC-19) Regular/Supplementary Examinations October - 2022

SYSTEM-ON CHIP DESIGN

[V L S I]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Recognize issues of Design for Timing Closure.	6 Marks	L2	CO1	PO1
	b)	Summarize Manufacturing Test strategies SoC.	6 Marks	L1	CO1	PO1
		(OR)				
2.		Analyze different specification problems in SoC Design.	12 Marks	L4	CO1	PO1
		UNIT-II				
3.	a)	Appraise the macro design process.	6 Marks	L4	CO2	PO1
	b)	Discuss about model development for Hard Macros.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Distinguish between Hard and Soft Macros Design Process.	6 Marks	L4	CO2	PO1
	b)	Evaluate the method of Soft Macro Productization.	6 Marks	L3	CO2	PO1
		UNIT-III				
5.	a)	Categorize and compare verification technology options.	6 Marks	L4	CO3	PO1
	b)	Develop an arbiter block RTL code for lint checking.	6 Marks	L3	CO3	PO1
		(OR)				
6.		List different verification approaches. Outline Verification Plans for all of the verification activities to be performed and explain them in detail.	12 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	Devise a methodology for creating a Soft Prototype. Also List the limitations of Soft Prototype.	6 Marks	L3	CO3	PO1
	b)	Asses Static Timing Verification to verify whether the design has met timing requirements or not.	6 Marks	L4	CO3	PO1
		(OR)				
8.		What are the several co verification methodologies in the market and discuss the basic methodology flow of the same.	12 Marks	L2	CO3	PO1
		UNIT-V				
9.	a)	Identify and explain Topologies, Protocols and Interfaces for On-chip Communication Architecture.	7 Marks	L2	CO4	PO3
	b)	Relate a method to minimize the energy consumed by Communication architecture and to improve its energy efficiency.	5 Marks	L3	CO4	PO1
		(OR)				
10.		List and assess the performance of various Adaptive Communication Architectures.	12 Marks	L4	CO4	PO3

CODE No.: 19MT25707 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.Tech II Semester (SVEC-19) Regular/Supplementary Examinations October - 2022

NETWORK-ON-CHIP DESIGN

[V L S I]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Illustrate Interconnection network of modern multiprocessor system-on-chip (MPSoC) architectures.	6 Marks	L2	CO1	PO1
	b)	Model 4 x 4 2D torus with single core connected to each router.	6 Marks	L4	CO1	PO1
		(OR)				
2.	a)	Categorize Switching techniques in NoC.	6 Marks	L2	CO1	PO1
	b)	Show MoT(Mess of Tree) topology and its simplified graph.	6 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Model dynamic adaptive–deterministic odd–even (DyAD–OE) router architecture.	6 Marks	L4	CO1	PO1
	b)	Examine the communication strategy of GALS style using dual-clock FIFO in NoC router.	6 Marks	L3	CO1	PO1
		(OR)				
4.	a)	Explain in detail about Round-robin arbiter with Grant Signal Generation Logic.	6 Marks	L2	CO1	PO1
	b)	Summarize the architecture design of wormhole and Virtual channel for NoC.	6 Marks	L1	CO1	PO1
		UNIT-III				
5.	a)	Classify Routing algorithms in NoC.	6 Marks	L2	CO2	PO2
	b)	Distinguish Resource dependency graph with: i) hold and wait-for relations and ii) wait-for relations for Deadlock Avoidance	6 Marks	L2	CO2	PO1
		(OR)				
6.	a)	List typical approaches of QoS in NoC architectures.	6 Marks	L1	CO2	PO2
	b)	Examine Buffer less Routing Algorithms inNoC.	6 Marks	L3	CO2	PO1
		UNIT-IV				
7.	a)	Simplify notations an output arguments of function Scheduling policy in verification of NoC.	6 Marks	L1	CO3	PO1
	b)	Show the basic elements of NoC architecture.	6 Marks	L2	CO3	PO1
		(OR)				
8.	a)	Demonstrate the application of Formal Methods in NoCs Verification.	6 Marks	L2	CO3	PO1
	b)	Evaluate Protection of IP Cores from Side-Channel Attacks.	6 Marks	L3	CO3	PO3
		UNIT-V				
9.	a)	Inspect an overview of the exploration methodology of alternative topologies for 3D Networks-on-Chip.	6 Marks	L3	CO4	PO2
	b)	Analyze Deadlocks in routing protocols.	6 Marks	L4	CO4	PO2
		(OR)				
10.	a)	Interview Duplication of switch resources scheme of NoC.	6 Marks	L2	CO4	PO1
	b)	Assess taxonomy of routing algorithms in NoC protocols.	6 Marks	L2	CO4	PO3

CODE No.: 20MC1BS01 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. I Semester (SVEC-20) Supplementary Examinations October– 2022

COMPUTER ORIENTED STATISTICAL TECHNIQUES

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Illustrate the central tendency measures using suitable examples	6 Marks	L2	CO1	PO2
	b)	Calculate the IQR and determine if any salaries are outliers. The salaries are in dollars. $33,000 $64,500 $28,000 $54,000 $72,000 $68,500 $69,000 $42,000 $54,000 $120,000 $40,500.	6 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Discuss measures of skewness on univariate data with example.	6 Marks	L1	CO1	PO1
	b)	Define Kurtosis and explain normal distribution with example.	6 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	Describe Data types and structures using R.	6 Marks	L1	CO2	PO1
	b)	Illustrate Array operations in R programming.	6 Marks	L1	CO2	PO1
		(OR)				
4.	a)	Discuss Graphical Data Analysis using R	6 Marks	L2	CO2	PO1
	b)	Discuss the Time series Analysis using R.	6 Marks	L2	CO2	PO2
		UNIT-III				
5.	a)	Compare and contrast Binomial distribution and Poisson distribution with examples.	6 Marks	L1	CO3	PO1
	b)	Explain Binomial Distribution and find the probability of getting exactly 7 heads when Toss a coin for 12 times.	6 Marks	L1	CO3	PO5
		(OR)				
6.	a)	Explain probability distribution on random variables.	6 Marks	L1	CO3	PO1
	b)	Compare and contrast Normal probability distribution and Binomial probability distribution with suitable examples.	6 Marks	L1	CO3	PO5
		UNIT-IV				
7.		Apply Karl Pearson Coefficient of Correlation Direct Method on given data.	12 Marks	L2	CO4	PO1

Price of Apple (Rs.)	15	25	35	40	50	65	75
Supply of Apples (Units)	2	5	6	8	9	10	14

		(OR)				
8.	a)	Explain simple linear Regression analysis and Multi Linear Regression analysis with suitable examples.	6 Marks	L2	CO4	PO2
	b)	Discuss 7 steps to Run a linear Regression Analysis using R.	6 Marks	L1	CO4	PO1
		UNIT-V				
9.	a)	Describe Hypothesis testing and prove null hypothesis, Alternate hypothesis on given statement “A researcher thinks that if knee surgery patients go to physical therapy twice a week (instead of 3 times), their recovery period will be longer. Average recovery times for knee surgery patients is 8.2 weeks.	6 Marks	L1	CO5	PO1
	b)	Explain Chi square test and F-test and t-test with suitable examples.	6 Marks	L3	CO5	PO4

(OR)

10.	a)	Explain Statistical significance and Type I error and Type2 error rate.	6 Marks	L2	CO5	PO2
	b)	Discuss Two Sample t test for Comparing Two Means with suitable examples.	6 Marks	L3	CO5	PO4

CODE No.: 20MC10101 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. I Semester (SVEC-20) Supplementary Examinations October– 2022

COMPUTER NETWORKS

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	What do you mean by computer network? Classify computer networks and explain them in brief.	6 Marks	L2	CO1	PO1
	b)	Differentiate between Connection-Oriented *Vs* Connectionless Services.	6 Marks	L4	CO1	PO1
		(OR)				
2.	a)	Why twisted pair cables are preferable over coaxial cables? Explain.	6 Marks	L2	CO1	PO2
	b)	Compare OSI and TCP/IP reference models.	6 Marks	L4	CO1	PO1
		UNIT-II				
3.	a)	What are the design issues of Data Link Layer? Explain.	6 Marks	L2	CO3	PO2
	b)	Explain any two error correction mechanisms in detail.	6 Marks	L2	CO2	PO2
		(OR)				
4.	a)	Explain in detail about the Simplex Stop and Wait protocol.	6 Marks	L2	CO2	PO2
	b)	Explain briefly about the Persistent and Non-persistent CSMA protocols.	6 Marks	L2	CO2	PO3
		UNIT-III				
5.	a)	Explain the link state Routing Algorithm with an example.	6 Marks	L2	CO3	PO3
	b)	Describe the General principles of Congestion Control.	6 Marks	L3	CO3	PO2
		(OR)				
6.	a)	Differentiate between Virtual circuit *Vs* Datagram Subnets.	6 Marks	L4	CO3	PO3
	b)	Write briefly about congestion control for multicasting.	6 Marks	L2	CO3	PO2
		UNIT-IV				
7.	a)	Define UDP. Discuss the operations of UDP.	6 Marks	L2	CO3	PO3
	b)	Draw and explain each field in the TCP Segment header.	6 Marks	L2	CO3	PO3
		(OR)				
8.	a)	Identify and explain the states involved in TCP.	6 Marks	L2	CO3	PO3
	b)	Explain in detail the various TCP congestion control mechanisms.	6 Marks	L2	CO3	PO3
		UNIT-V				
9.	a)	Explain in brief about the formats of HTTP request and Response messages.	6 Marks	L2	CO4	PO4
	b)	Describe importance of DNS in application layer.	6 Marks	L2	CO4	PO4
		(OR)				
10.	a)	What is a name server? List and explain the features of various name servers.	6 Marks	L2	CO4	PO4
	b)	What is electronic E-mail? Describe in brief about the two architectures of E-Mail.	6 Marks	L2	CO4	PO4

❀ ❀ ❀

CODE No.: 20MC10102 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. I Semester (SVEC-20) Supplementary Examinations October– 2022

DATABASE MANAGEMENT SYSTEMS

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Briefly explain about physical view and logical view.	6 Marks	L1	CO1	PO1
	b)	What is meant by data independence? Explain the difference between physical data independence and logical data independence.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Write short notes on data models, schemas and instances.	6 Marks	L2	CO2	PO2
	b)	Analyze the concepts of class hierarchy and aggregation features of Entity Relationship model with an example.	6 Marks	L4	CO3	PO3
		UNIT-II				
3.	a)	Discuss the Characteristics of Relations.	6 Marks	L2	CO3	PO3
	b)	Differentiate between entity and referential integrity constraints.	6 Marks	L2	CO4	PO4
		(OR)				
4.		Construct an Entity Relationship diagram for a university database. Assume your own entities (Minimum of 5 entities), attributes and relations. Explain in detail.	12 Marks	L3	CO3	PO3
		UNIT-III				
5.	a)	Explain with suitable example that, if a relation is in 3NF then necessarily it should be in 2NF.	6 Marks	L3	CO2	PO2
	b)	Describe Dependency preservation with an example.	6 Marks	L3	CO2	PO2
		(OR)				
6.		Make use of Structured Query Language in solving the following with proper example: i) Nested Queries. ii) Joins.	12 Marks	L3	CO4	PO4
		UNIT-IV				
7.		What is the two-phase locking protocol? What are the variations of it? How does it guarantee serializability?	12 Marks	L2	CO5	PO5
		(OR)				
8.	a)	Discuss why concurrency control is needed. Give informal example.	8 Marks	L2	CO5	PO5
	b)	What is transaction rollback?	4 Marks	L2	CO5	PO5
		UNIT-V				
9.	a)	Write differences between fixed length records and variable length records.	6 Marks	L3	CO2	PO2
	b)	Briefly explain different types of single level ordered Indexes.	6 Marks	L3	CO2	PO2
		(OR)				
10.		What are different Hashing Techniques that allow dynamic file expansion?	12 Marks	L2	CO2	PO2

CODE No.: 20MC10103 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. I Semester (SVEC-20) Supplementary Examinations October– 2022

DATA STRUCTURES AND ALGORITHMS

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Compare bubble and selection sorting methods.	6 Marks	L2	CO2	PO2
	b)	Write binary search algorithm and find its time complexity.	6 Marks	L2	CO2	PO2
		(OR)				
2.	a)	What is data structure and give examples? List out applications of each data structure.	6 Marks	L2	CO1	PO2
	b)	Sort the following numbers using insertion sort. 39, 48, 62, 18, 23, 34, 58.	6 Marks	L3	CO2	PO2

UNIT-II

3.	a)	What is the difference between singly linked list, doubly linked list and circular linked list?	6 Marks	L2	CO3	PO3
	b)	Write an algorithm to delete a node from the beginning of the linked list.	6 Marks	L3	CO3	PO3
		(OR)				
4.		Write insertion and deletion algorithm for the doubly linked lists.	12 Marks	L3	CO3	PO3

UNIT-III

5.	a)	What is stack? Specify any four applications where stacks are extensively used.	6 Marks	L2	CO4	PO1
	b)	Write a routine to convert the following infix expression in to postfix expression: **a+b*c/(e+f*g).**	6 Marks	L3	CO4	PO1
		(OR)				
6.	a)	What is Queue? Specify any four applications where queues are extensively used.	6 Marks	L2	CO4	PO1
	b)	Write a routine to implement double ended queue (Deque).	6 Marks	L3	CO4	PO1

UNIT-IV

7.	a)	Explain Array representation of Binary tree.	6 Marks	L2	CO5	PO1
	b)	Construct a Binary tree T by using the following in order and post order traversals of T. In order: D K I B A E G H J F C. Post Order: K D I E A G B F C J H.	6 Marks	L3	CO5	PO1
		(OR)				
8.		What is Binary Search Tree (BST)? Explain insertion and deletion operations on BST.	12 Marks	L2	CO5	PO1

UNIT-V

9.	a)	Differentiate Breadth First Search and Depth First Search methods.	6 Marks	L2	CO5	PO1
	b)	Write a program to implement Depth First Search algorithm.	6 Marks	L3	CO5	PO1
		(OR)				
10.	a)	Differentiate between B Tree and B+ Tree.	6 Marks	L2	CO5	PO1
	b)	Explain Open addressing collision resolution in hashing.	6 Marks	L2	C06	PO2

CODE No.: 20MC2HS01 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. II Semester (SVEC-20) Regular/Supplementary Examinations October – 2022

FINANCIAL AND MANAGEMENT ACCOUNTING

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry marks

UNIT-I

1. Discuss the objectives and functions of Accounting. 12 Marks L2 CO1 PO2

(OR)

2. Explain the Accounting conventions in detail. 12 Marks L2 CO1 PO2

UNIT-II

3. From the following particulars prepare Balance Sheet of Madhu for the year ended 2020. 12 Marks L3 CO2 PO3

Liabilties	Amount	Assets	Amount
Capital	2,00,000	Creditors	40,000
Drawings	40,000	Bills Payable	20,000
Cash in hand	15,000	Goodwill	60,000
Loan from bank	40,000	Debtors	80,000
Bank overdraft	20,000	Land	50,000
Investments	20,000	Vehicles	80,000
Bills receivable	10,000	Cash At Bnk	25,000

The following adjustments are to be made.
i) Outstanding salaries : Rs 10,000,
ii) Wages Rs 20,000
iii) Interest on bank OD Rs 3,000 and interest on bank loan Rs 6,000.

(OR)

4. Differentiate Manual and Computerized Accounting. 12 Marks L3 CO2 PO3

UNIT-III

5. Discuss briefly different Leverage ratios. 12 Marks L2 CO1 PO2

(OR)

6. The assets and liabilities of a limited company are given below. You are required to calculate 12 Marks L3 CO2 PO3
i) Current Ratio ii) Liquidity Ratio and
iii) Proprietary Ratio.

Liabilities	Rs.	Assets	Rs.
5,000 Equity Shares of Rs. 100 each	5,00,000	Land & Buildings	6,00,000
2,000, 8% preference shares at Rs. 100 each	2,00,000	Plant, Machinery	5,00,000
9% Debentures	4,00,000	Stock	2,40,000
Reserves	3,00,000	Debtors	2,00,000
Creditors	1,50,000	Cash at Bank	55,000
Bank Overdraft	50,000	Prepaid Expense	5,000
	16,00,000		16,00,000

UNIT-IV

7.	Assuming that the cost structure and selling prices for remain the same in periods I and II, find out: i) Profit Volume ratio ii) Break Even Point for Sales iii) Profit when sales are of Rs. 100,000 iv) Sales required to earn a profit of Rs. 20,000 and v) Variable Cost in Period II	12 Marks	L3	CO2	PO3

Period	Sales	Cost	Profit
I	1,20,000	1,11,000	9,000
II	1,40,000	1,27,000	13,000

A company prepares a budget to produce 3,00,000 units with fixed cost Rs. 15,00,000/-,Variable cost is Rs.10/- per unit Profit is 20% on Total Cost. Calculate BEP in units and Sales as well as P/V ratio, Margin of Safety and Contribution.

(OR)

8.	Explain the advantages and disadvantages of break even analysis.	12 Marks	L2	CO1	PO2

UNIT-V

9.	Explain modern techniques of project evaluation.	12 Marks	L2	CO1	PO2

(OR)

10.	A project costs Rs.5,00,000 and is expected to generate net cash inflow of Rs.3,00,000,Rs.2,50,000 and Rs.2,00,000 over its life of three years. Cost of capital is 10%. Calculate Payback period and Net Present value of the Project.	12 Marks	L3	CO2	PO3

CODE No.: 20MC20101 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. II Semester (SVEC-20) Regular/Supplementary Examinations October – 2022

DATA WAREHOUSING AND DATA MINING

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Describe spread sheets to data cubes.	6 Marks	L1	CO1	PO1
	b)	Define data ware housing and explain benefits of data ware housing.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Describe data warehouse architecture.	6 Marks	L1	CO1	PO2
	b)	Write about Start, snowflake schemas.	6 Marks	L1	CO1	PO3
		UNIT-II				
3.	a)	Explain need of processing the data.	6 Marks	L2	CO2	PO2
	b)	Describe classification of data mining functionalities.	6 Marks	L2	CO2	PO1
		(OR)				
4.		Describe Data Integration, Data Transformation and Data Reduction, Data Cleaning.	12 Marks	L4	CO2	PO2
		UNIT-III				
5.	a)	Explain Bayesian Classification.	6 Marks	L3	CO3	PO3
	b)	Describe classification by decision Tree Induction.	6 Marks	L3	CO2	PO1
		(OR)				
6.		Evaluate the accuracy of a classifier or predictor, bagging and boosting.	12 Marks	L4	CO2	PO3
		UNIT-IV				
7.	a)	Explain Grid-Based Method-STING.	6 Marks	L1	CO4	PO4
	b)	Describe types of data in cluster analysis.	6 Marks	L2	CO3	PO1
		(OR)				
8.		Explain partitioning methods (k-means, k-medians).	12 Marks	L2	CO3	PO3
		UNIT-V				
9.	a)	Explain Multi-Media Data mining.	6 Marks	L4	CO3	PO4
	b)	Explain Text Mining Approaches.	6 Marks	L4	CO4	PO2
		(OR)				
10.		Explain Data Mining Applications.	12 Marks	L2	CO4	PO3

❀ ❀ ❀

CODE No.: 20MC20102 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. II Semester (SVEC-20) Regular/Supplementary Examinations October – 2022

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

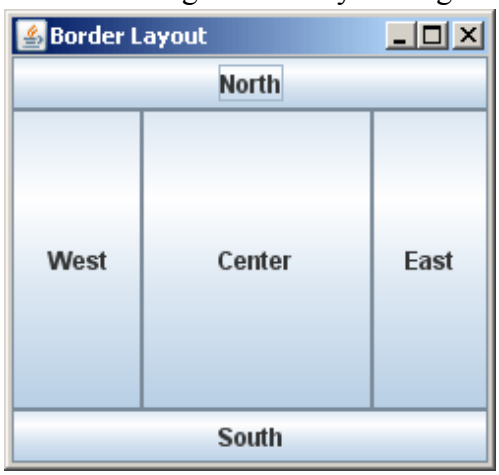
Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain different operators available in JAVA.	9 Marks	L3	CO1	PO1
	b)	Describe about garbage collection in Java.	3 Marks	L3	CO1	PO2
		(OR)				
2.		Explain different control statements available in JAVA with code fragment.	12 Marks	L3	CO1	PO3 PO4
		UNIT-II				
3.	a)	Explain Multilevel Inheritance with an example program.	6 Marks	L2	CO2	PO1
	b)	What is an Abstract Class? Give a suitable example program.	6 Marks	L2	CO2	PO3
		(OR)				
4.	a)	How do you define a subclass for a class? Explain the concept with an example.	6 Marks	L3	CO2	PO4
	b)	Describe the concept of Dynamic method dispatch.	6 Marks	L3	CO1	PO3
		UNIT-III				
5.	a)	Explain about Collection frame work for the following: i) Hash Set. ii) Array List.	6 Marks	L1	CO3	PO2
	b)	Elaborate the concept of Console Class and illustrate with an example.	6 Marks	L2	CO2	PO4
		(OR)				
6.		Describe the following Byte streams. i) File Input Stream. ii) File Ouput Stream. iii) Print Stream.	12 Marks	L1	CO3	PO1 PO2
		UNIT-IV				
7.		Define a Thread. Explain about Thread Life Cycle with suitable example.	12 Marks	L1	CO3	PO2 PO3
		(OR)				
8.	a)	How do you throw your own exception? Explain with an example program.	6 Marks	L2	CO3	PO4
	b)	Explain Multiple Catch blocks and Nested Try blocks.	6 Marks	L1	CO3	PO5
		UNIT-V				
9.	a)	Explain about the following Swing Components. i) Check Boxes. ii) Radio Buttons.	6 Marks	L4	CO4	PO1 PO2
	b)	Illustrate about Event Delegation Model.	6 Marks	L3	CO4	PO4

(OR)

10. a) Design an applet that arranges 5 buttons with labels North, South, East, West, and Center using Border Layout as given below. 6 Marks L3 CO4 PO5



b) Explain the following: 6 Marks L4 CO4 PO4

i) JFrame ii) JButton iii) JText Field

CODE No.: 20MC20103 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. II Semester (SVEC-20) Regular/Supplementary Examinations October – 2022

CRYPTOGRAPHY AND NETWORK SECURITY

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Classify various security attacks defined in X.800.	6 Marks	L3	CO1	PO2
	b)	Explain any two substitution techniques in detail with an example.	6 Marks	L4	CO1	PO3
		(OR)				
2.	a)	Summarize symmetric cipher model with a neat diagram and what are the main requirements for the secure use of symmetric encryption?	6 Marks	L2	CO1	PO2
	b)	List and explain security mechanisms defined in X.800.	6 Marks	L4	CO1	PO1
		UNIT-II				
3.	a)	State the principles of public-key cryptosystem and explain.	5 Marks	L2	CO1	PO1
	b)	What is the purpose of Diffie-Hellman key exchange algorithm and explain the algorithm?	7 Marks	L5	CO3	PO5
		(OR)				
4.	a)	Analyze the Encryption process in Data Encryption Standard (DES).	7 Marks	L4	CO3	PO3
	b)	Summarize RSA algorithm and perform encryption and decryption using RSA algorithm for p=3, q=11, e=7 and m=5.	5 Marks	L6	CO3	PO5
		UNIT-III				
5.	a)	Explain Message Authentication Code based on DES with neat sketch.	6 Marks	L4	CO3	PO3
	b)	Discuss the techniques of distributing public keys in public-key cryptography.	6 Marks	L3	CO3	PO2
		(OR)				
6.	a)	Define Digital Signature and explain Digital Signature algorithm.	7 Marks	L5	CO3	PO5
	b)	Draw and analyze X.509 Certificate Format.	5 Marks	L4	CO3	PO1
		UNIT-IV				
7.		Explain in detail the packet formats of Authentication Header and Encapsulating Security Payload in both Transport mode and Tunnel mode with neat diagrams.	12 Marks	L4	CO2	PO3
		(OR)				
8.	a)	What are the services that PGP provide and explain the general format of a PGP message?	7 Marks	L4	CO2	PO2
	b)	Summarize the cryptographic algorithms used in the functions provided by S/MIME.	5 Marks	L2	CO2	PO5
		UNIT-V				
9.	a)	Explain in brief the SSL Handshake protocol and Record protocol.	6 Marks	L4	CO4	PO4
	b)	Discuss the approaches to intrusion detection in brief.	6 Marks	L3	CO4	PO1
		(OR)				
10.		What are the characteristics of a Firewall? Discuss the types of firewall with diagrams in detail.	12 Marks	L4	CO4	PO2

❀ ❀ ❀

CODE No.: 20MC20109 SVEC-20

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. II Semester (SVEC-20) Regular/Supplementary Examinations October – 2022

MACHINE LEARNING

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	List the steps that are involved in designing a learning system and explain about choosing the training experience with an example.	6 Marks	L2	CO1	PO1
	b)	Explain the concept learning task for the following example.	6 Marks	L3	CO1	PO1

Day	Sky	Airtemp	Humidity	Wind	Water	Forecast	WaterSport
1.	Sunny	Warm	Normal	Strong	Warm	Same	Yes
2.	Sunny	Warm	High	Strong	Warm	Same	Yes
3.	Rainy	Cold	High	Strong	Warm	Change	No
4.	Sunny	Warm	High	Strong	Cool	Change	Yes

(OR)

2.	a)	Explain the different issues in machine learning.	6 Marks	L2	CO1	PO1
	b)	Explain version space and representation of version space with an example.	6 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Discuss about the basic decision tree algorithm.	6 Marks	L2	CO2	PO1
	b)	Differentiate Restriction Biases and Preference Biases in decision tree learning.	6 Marks	L2	CO2	PO1

(OR)

4.	a)	Explain the back propagation algorithm.	6 Marks	L2	CO2	PO3
	b)	Discuss the appropriate problems for neural network learning.	6 Marks	L2	CO2	PO3

UNIT-III

5.	a)	Explain naïve bayes classifier.	6 Marks	L1	CO1	PO2
	b)	Write about minimum description length principle.	6 Marks	L2	CO1	PO3

(OR)

6.	a)	Discuss about EM algorithm.	6 Marks	L2	CO1	PO1
	b)	Explain about probably approximately correct learning model.	6 Marks	L1	CO1	PO1

UNIT-IV

7.		Explain in detail probably approximately correct learning model of computational learning.	12 Marks	L2	CO3	PO1

(OR)

8.	a)	Write the possible alternative methods for learning set of rules and explain.	6 Marks	L2	CO3	PO1
	b)	Discuss about the explanation-based learning algorithm. PROLOG EBG.	6 Marks	L2	CO3	PO2

UNIT-V

9.	a)	Explain KBANN algorithm.	6 Marks	L2	CO4	PO1
	b)	Write about TANGENTPROP algorithm.	6 Marks	L2	CO4	PO2

(OR)

10.		Discuss in detail about the learning tasks and Q learning in the context of reinforcement learning.	12 Marks	L3	CO4	PO1

CODE No.: 14BT1BS03 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

I B.Tech (SVEC14) Supplementary Examinations, November - 2022

ENGINEERING MATHEMATICS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Solve: $\frac{dy}{dx} + x\sin 2y = x^3\cos^2 y.$ 7 Marks

b) Solve: $y'' - 2y' + y = e^x \log x$ by the method of variation of parameters. 7 Marks

(OR)

2 a) Solve: $(D^2 - 2D + 1)y = xe^x \sin x.$ 7 Marks

b) The temperature of the body drops from 100^0C to 75^0C in ten minutes when the surrounding air is at 20^0C temperature. What will be its temperature after half an hour. When will the temperature be 25^0C. 7 Marks

UNIT-II

3 a) Express equation $\frac{\partial^2 y}{\partial x^2} + \frac{\partial^2 y}{\partial y^2} = 0$ in polar form (r, θ). 7 Marks

b) Show that the rectangular solid of maximum volume that can be inscribed in a sphere is cube. 7 Marks

(OR)

4 a) Trace the curve $a^2y^2 = x^2(a^2 - x^2)$. 7 Marks

b) Find the radius of curvature at any point of the cardioid $r = a(1 - \cos\theta)$. 7 Marks

UNIT-III

5 a) Find the length of an arc of the cycloid $x = a(\theta + \sin\theta), y = a(1 + \cos\theta)$. 7 Marks

b) Evaluate $\iint_R ydxdy$ where R is the region bounded by the parabolas $y^2=4ax$ and $x^2=4ay$. 7 Marks

(OR)

6 a) Evaluate $\int_0^1 \int_0^{2-x} xy\ dxdy$ by changing the order of integration. 7 Marks

b) Evaluate $\iiint_V \frac{dxdydz}{(x + y + z + 1)^3}$ taken over the volume bounded by the planes $x = 0$, $y = 0$, $z = 0$ and the plane $x + y + z = 1$. 7 Marks

UNIT-IV

7 a) Find the Laplace transform of $f(t) = \begin{cases} \sin(wt) & when \quad 0 < t < \pi / w \\ 0 & when \quad \pi / w < t < 2\pi / w \end{cases}$. 7 Marks

b) Find the inverse Laplace transform of $(i)\log\left(\frac{s^2+1}{(s-1)^2}\right)$ $(ii)\frac{s+2}{(s^2+4s+5)^2}$. 7 Marks

(OR)

8 a) Solve $y'' + 2y' - 3y = \sin t$ such that $y'(0) = 0$ *and* $y(0) = 0$. 7 Marks

b) Find the Laplace transform of *(i)* $\boldsymbol{\cos^3 2t}$ *(ii)* $\boldsymbol{e^{-2t}\cosh 3t}$ 7 Marks

UNIT-V

9 a) Find the work done in moving a particle in the force field 7 Marks
$\overline{F} = 3x^2\bar{i} + (2xz - y)\bar{j} + z\bar{k}$, along the straight line from (0, 0, 0) to (2, 1, 3).

b) Find the directional derivative of the function $f(x, y, z) = x^2 - y^2 + 2z^2$ at the point $P(1, 2, 3)$ in the direction of the line PQ where $Q(5, 0, 4)$. 7 Marks

(OR)

10 a) Verify divergence theorem for $\boldsymbol{F = x^2 i + y^2 j + z^2 k}$ taken over the rectangular parallelepiped $\boldsymbol{0 \le x \le a, 0 \le y \le b, 0 \le z \le c}$. 7 Marks

b) Evaluate $\iiint_V xyz\, dx\, dy\, dz$ take over the volume V of the tetrahedron given by 7 Marks
$\boldsymbol{x \ge 0,\ y \ge 0,\ z \ge 0}$ and $\boldsymbol{x + y + z \le 1}$.

CODE No.: 16BT1BS01 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations, November – 2022

ENGINEERING CHEMISTY

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Three samples of water are collected from Bandara palli (**BP**), Naravari Palli (**NP**) and Sree Sainath Nagar (**SSN**). 100 mL of the water sample collected at **BP** requires 34 mL of 0.01 M EDTA solution on titration. 100 mL of the water sample collected at **NP** required 48 mL of 0.01 M EDTA solution on titration. 100 mL of the water sample collected at **SSN** requires 15 mL of 0.01 M EDTA solution on titration. Discuss the result and suggest the sample which can be directly used for drinking with respect to only Hardness (WHO standard: Hardness < 200 ppm of $\mathbf{CaCO_3}$).	10 Marks
	b)	Why hard water consumes lot of soap? Explain your answer with chemical reactions.	4 Marks
		(OR)	
2	a)	Give the specifications of Water for "steam generation". Explain Boiler corrosion, scale and sludge formation	7 Marks
	b)	Discuss ion exchange process of water softening with neat diagram. Give the chemical reactions where ever is necessary	7 Marks

UNIT-II

3	a)	Explain the role of chemistry in Engineering materials with suitable examples.	7 Marks
	b)	Explain engineering applications of Composites.	7 Marks
		(OR)	
4	a)	Discuss: i) Intrinsically conducting polymer. ii) Extrinsically conducting polymer.	7 Marks
	b)	Discuss the Properties and classification of Bio-degradable polymers.	7 Marks

UNIT-III

5	a)	Write notes on: i) Use of alternative feedstocks. ii) Use of safe reagents.	8 Marks
	b)	Write informative notes on recent trends in Nano Technology.	6 Marks
		(OR)	
6	a)	Classify the nanomaterials.	10 Marks
	b)	Green solutions - explain their role in green synthesis.	4 Marks

UNIT-IV

7	a)	Based on the chemistry that takes place; explain Ni-Cd battery is called "secondary storage battery."	8 Marks
	b)	Summaries the role of fuel cells in the modern world.	6 Marks
		(OR)	

8	a)	Construct a lithium ion battery and explain the chemistry involved in it	10 Marks
	b)	Fuel cells were invented in 1839, but never developed into practical devices for producing electrical energy until the U.S. space program in the 1960s. What advantages did fuel cells have over previous power sources?	4 Marks

UNIT-V

9	a)	i) When a coating is plated onto a metal, two different metals are in contact with each other. Why doesn't galvanic corrosion occur at this interface? ii) Aluminium is used extensively as a construction metal. What are two important properties of Aluminium that make it particularly desirable for construction purposes? iii) Explain how corrosion can be considered as extractive metallurgy in reverse.	10 Marks
	b)	Discuss any two factors influencing rate of corrosion with suitable example.	4 Marks

(OR)

10	a)	Explain the chemistry involved in concentration cell corrosion.	4 Marks
	b)	Discuss in detail the classification and properties of Lubricants.	10 Marks

CODE No.: 16BT1BS02 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations November – 2022

ENGINEERING PHYSICS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define acceptance angle, acceptance cone and numerical aperture. Derive the expression for numerical aperture in terms of refractive index of the core and the cladding of an optical fiber.	12 Marks
	b)	List any four applications of laser.	2 Marks
		(OR)	
2	a)	What is meant by population inversion? How is it achieved?	5 Marks
	b)	Derive the relation between the probabilities of spontaneous emission and stimulated emission in terms of Einstein's coefficient.	9 Marks

UNIT-II

3		Discuss with suitable mathematical expressions, the Kronig – Penney model for the energies of an electron in a crystal.	14 Marks
		(OR)	
4	a)	Show that the energies of a particle in a one dimensional potential box are quantized.	10 Marks
	b)	Write the conclusions of Kronig – Penney model of periodic potentials.	4 Marks

UNIT-III

5	a)	Develop an expression for local filed of an atom in a dielectric material using Lorentz method.	9 Marks
	b)	What is ferroelectricity?	2 Marks
	c)	The dielectric constant of a medium is 4. The electric field applied to the dielectric material is 10^6**V/m**. Calculate electric displacement and polarization. Give that the relative permittivity of free space is 8.85×10^{-12} **F/m.**	3 Marks
		(OR)	
6	a)	How do you apply frequency dependence of polarization to analyse variation of dielectric constant of material as frequency of alternating electric field changes from radio wave to optical frequency range?	5 Marks
	b)	With usual notations show that $\alpha_e = \varepsilon_o(\varepsilon_r - 1)/N$.	9 Marks

UNIT-IV

7	a)	Explain Josephson Effect in superconductor.	8 Marks
	b)	What is meant by flux quantization ?	3 Marks
	c)	Calculate the critical temperature and critical current for a wire of lead having a diameter 1 mm at 4.2 K. The critical temperature for the lead is 7.18 **K** and H_o = 6.5 x 10^{-4}**A/m**.	3 Marks
		(OR)	

8	a)	Distinguish between type-I and type-II superconductors.	8 Marks
	b)	Explain how penetration depth for a superconductor varies with magnetic field strength and temperature.	4 Marks
	c)	A lead superconductor with T_c = 7.22 K has a critical magnetic field of 6.5 x $\mathbf{10^3}$ $\mathbf{Am^{-1}}$ at absolute zero, then find the value of critical field at 5**K**.	2 Marks

UNIT-V

9	a)	Sketch the following planes in a cubic crystal (100), (110) and (111).	6 Marks
	b)	What are nano materials and what are their importances? List any six applications of nano materials.	8 Marks

(OR)

10	a)	What are nano materials? List any four applications of nano materials.	6 Marks
	b)	Suggest and describe a method which can give us an understanding of the possible crystal structure by using a mono chromatic X- ray diffraction.	8 Marks

CODE No.: 16BT1BS03 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations, November - 2022

MATRICES AND NUMERICAL METHODS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Determine the characteristic values and characteristic vectors of the matrix A= 10 Marks

$$\begin{bmatrix} -2 & 2 & -3 \\ 2 & 1 & -6 \\ -1 & -2 & 0 \end{bmatrix}$$

b) 4 Marks

Two Eigen values of the matrix A= $\begin{bmatrix} 2 & 2 & 1 \\ 1 & 3 & 1 \\ 1 & 2 & 2 \end{bmatrix}$ are 1 each. Find the Eigen values of A^{-1}.

(OR)

2 Reduce the quadratic form $3x^2 + 5y^2 + 3z^2 - 2xy - 2xz + 2yz$ into canonical form by orthogonal transformation. Also identify its nature, rank, signature and index. 14 Marks

UNIT-II

3 a) Using the bisection method, find a real root of the equation x log x=3.375 lying between 2 and 3. 7 Marks

b) If P is the pull required to lift a load W by means of a pulley block, evaluate a linear equation of the form **P=mW** + c connecting **P** and **W**, using the following data: 7 Marks

P	12	15	21	25
W	50	70	100	120

Where **P** and **W** are taken in **kg-wt**. Compute P when **W=150 kg.wt.**

(OR)

4 a) Applying Newton- Raphson method, find the root of the equation **$x+\log_{10} x=3.375$** correct to four significant figures. 7 Marks

b) In some determinations of the volume v of carbon dioxide dissolved in a given volume of water at different temperatures θ , the following pair of values were obtained: 7 Marks

θ	0	5	10	15
v	1.80	1.45	1.18	1.00

Obtain by the method of least squares, a relation of the form $v= a+b\theta$ which best fits to these observations.

UNIT-III

5 a) The following are data from a steam table: 7 Marks

Temperature (°C):	140	150	160	170	180
Pressure **kg/cm^2**:	3.685	4.854	6.302	8.076	10.225

Using Newton's formula, find the pressure of steam for a temperature 142°C.

b) If y (1) = -3, y(3) = 9, y(4) = 30 , y(6) = 132, find the Lagrange's interpolation polynomial that takes the same values as y at the given points. 7 Marks

(OR)

6 a) Find the number of men getting wages below Rs 15/- from the following data by using suitable interpolation technique: 7 Marks

Wages(Rs):	0-10	10-20	20-30	30-40
Frequency:	9	30	35	42

b) Construct the Newton's forward interpolation polynomial for the following data 7 Marks

x	0	1	2	3
f(x)	1	5	11	19

hence evaluate **f(5).**

UNIT-IV

7 A Curve is drawn to pass through the points given by the following table 14 Marks

x:	1	1.5	2	2.5	3	3.5	4
y:	2	2.4	2.7	2.8	3	2.6	2.1

Estimate the area bounded by the curve, x-axis and the lines x=1, x=4. Also find the volume of solid of revolution generated by revolving this area about x-axis.

(OR)

8 a) Find the first and second derivatives of the function tabulated below, at the point x = 1.2 7 Marks

x:	1.0	1.2	1.4	1.6	1.8	2.0
f(x):	0	0.128	0.544	1.296	2.432	4.00

b) Find, from the following table, the area bounded by the curve and the x-axis from x=7.47 to x=7.52. 7 Marks

x	7.47	7.48	7.49	7.50	7.51	7.52
f(x)	1.93	1.95	1.98	2.01	2.03	2.06

UNIT-V

9 Use Runge-Kutta method of order four to compute the value of **'y'** when 'x=0.4' in steps of 0.2 given that $\frac{dy}{dx} = y^2 + 1$ and y(0)=0. 14 Marks

(OR)

10 Apply Milne's method, to find a solution of the differential equation $\frac{dy}{dx} = x - y^2$ in the range $0 \le x \le 1$ for the initial condition y(0)=0. 14 Marks

CODE No.: 16BT1BS04 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations, November - 2022

MULTIVARIABLE CALCULUS AND DIFFERENTIAL EQUATIONS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Obtain the solution of the differential equation $\frac{dy}{dx}\left(x^2y^3 + xy\right) = 1$. 7 Marks

b) Determine the orthogonal trajectories of the family of curves $x^{2/3} + y^{2/3} = a^{2/3}$, where 'a' is the parameter. 7 Marks

(OR)

2 a) Identify the order and degree and Determine the solution of the differential equation $\frac{dy}{dx} + \frac{y}{x} = y^2 x \sin x$ 7 Marks

b) Determine the orthogonal trajectories of the family of cardioids $r = a(1 - \cos\theta)$, where 'a' is the parameter. 7 Marks

UNIT-II

3 a) Determine the solution of initial value problem $y'' - y' - 2y = 3e^{2x}, y(0) = 0, y'(0) = -2$. 7 Marks

b) The charge $q(t)$ on the capacitor is given by the differential equation $\frac{d^2q}{dt^2} + 12\frac{dq}{dt} + 100q = 24\sin 10t$. If the charge q=0 and current i=0 at t=0, then determine the charge at time t > 0. 7 Marks

(OR)

4 a) Determine the solution of $\left(D^2 - 3D + 2\right)y = \cosh x$. 7 Marks

b) Apply variation of parameter method and obtain the solution of $\left(D^2 + a^2\right)y = \sec ax$. 7 Marks

UNIT-III

5 a) If $u = f(2x - 3y, 3y - 4z, 4z - 2x)$ then prove that $\frac{1}{2}\frac{\partial u}{\partial x} + \frac{1}{3}\frac{\partial u}{\partial y} + \frac{1}{4}\frac{\partial u}{\partial z} = 0$. 7 Marks

b) If $u = \frac{yz}{x}, v = \frac{zx}{y}, w = \frac{xy}{z}$ show that $\frac{\partial(u,v,w)}{\partial(x,y,z)} = 4$. 7 Marks

(OR)

6 a) Estimate the extreme values of the function $f(x,y) = x^3 + 3xy^2 - 3x^2 - 3y^2 + 4$. 7 Marks

b) If $u = x + y + z, y + z = uv, z = uvw$ show that $\frac{\partial(x,y,z)}{\partial(u,v,w)} = u^2v$. 7 Marks

UNIT-IV

7 a) Find the entire length of cardioid $r = a(1+\cos\theta)$. 7 Marks

b) Evaluate the double integral $\int_0^1 \int_0^{\sqrt{1+x^2}} \frac{dydx}{1+x^2+y^2}$. 7 Marks

(OR)

8 a) Evaluate $\iint r^3 drd\theta$ over the area included between the circles $r = 2\sin\theta$ and $r = 4\sin\theta$. 7 Marks

b) Apply change of order of integration method, and evaluate $\int_0^1 \int_x^{\sqrt{x}} xydydx$. 7 Marks

UNIT-V

9 a) Obtain the directional derivative of $f = x^2 - y^2 + 2z^2$ at the point P(1,2,3) in the direction of the line PQ where Q is the point (5,0,4). 7 Marks

b) Verify the Green's theorem for $\oint_C [(xy+y^2)dx + x^2dy]$, where c is bounded by $y = x$ and $y = x^2$. 7 Marks

(OR)

10 a) Identify the value of a for which the given vector function $(ax^2y + yz)i + (xy^2 - xz^2)j + (2xyz - 2x^2y^2)k$ is solenoidal. 7 Marks

b) Apply Green's and evaluate $\oint_C [(y-\sin x)dx + \cos x dy]$ where C is the plane triangle enclosed by the lines $y = 0, x = \frac{\pi}{2}$ and $y = \frac{2}{\pi}x$. 7 Marks

CODE No.: 16BT10501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Supplementary Examinations, November – 2022

PROGRAMMING IN C

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) What are unsigned integer constants? What are long integer constants? How do these constants differ from ordinary integer constants? How can they be written and identified? 7 Marks

b) What is the largest permissible magnitude of an integer constant? State your answer in decimal, octal and hexadecimal. 7 Marks

(OR)

2 a) How are initial values assigned to variables within a type declaration? How are strings assigned to one dimensional, character-type arrays? 7 Marks

b) What is a subscript? What range of values is permitted for the subscript of a one-dimensional, n-element array? 7 Marks

UNIT-II

3 a) Write a program to accept a list of strings and display the largest string. 7 Marks

b) Summarize the syntactic rules associated with the **if - else** statement. 7 Marks

(OR)

4 a) What is the purpose of the while statement? When is the logical expression evaluated? What is the minimum number of times that a while loop can be executed? 9 Marks

b) A C program contains the following statements: 5 Marks

```
#include <stdio.h>
int i, j , k;
```

Write an appropriate scanf() function to enter numerical values for i, j and k, assuming

i) The values for i,j and k will be decimal integers.
ii) The value for i will be a decimal integer, j an octal integer and k a hexadecimal integer.
iii) The values for i and j will be hexadecimal integers and k will be an octal integer.

UNIT-III

5 a) Using recursive functions implement a program to print all prime numbers between given two positive numbers N,M where N<M. What is a recursion? Write a recursive function to find n! 7 Marks

b) Write a program calculate the sum of the elements in two tables of integers. 7 Marks

(OR)

6 a) How arrays are usually processed in C? Can entire arrays be processed with single instructions, without repetition? 7 Marks

b) Illustrate the concept of Pointer to an Array and Array of Pointers with an example Program. 7 Marks

UNIT-IV

7	a)	Write a program to compare two strings by using pointers.	7 Marks
	b)	Develop a program to read a line of text and a string **str1** to count how many number of times **str1** exist in the given line of text.	7 Marks

(OR)

8	a)	Distinguish the concept of Call-by-Value and Call-by-Reference.	7 Marks
	b)	Develop a program to read N strings from the user and then arrange them in dictionary order.	7 Marks

UNIT-V

9	a)	How a member of a union variable is assigned an initial value? In what way does the initialization of a union variable differ from the initialization of a structure variable?	7 Marks
	b)	Define a structure CRICKET whose fields are name of the player, number of innings played, total runs scored and batting average. Using CRICKET declare an array ***x*** with 50 elements and write a program to read the name, number of innings and total runs scored by each of the 50 players, and find the batting average. Display all the 50 players details sorted by batting average in tabular from.	7 Marks

(OR)

10	a)	Describe the Significance of Files and explain the String oriented functions in Files. Write a Program to read a File consisting of Strings.	7 Marks
	b)	Explain the **fopen**() function in files and illustrate the different modes of Opening a file.	7 Marks

CODE No.: 19BT1BS01 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations, November - 2022

DIFFERENTIAL EQUATIONS AND MULTIVARAIBLE CALCULUS

[Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Solve the differential equation $(D^3 - 6D^2 + 11D - 6)y = 2^x + \cos 2x$	6 Marks	L3	CO1	PO1 PO2
	b)	Solve the differential equation $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = xe^x \sin x$	6 Marks	L3	CO1	PO1 PO2
		(OR)				
2.	a)	Using the method of variation of parameters solve $\frac{d^2y}{dx^2} - 4y = x\sin x$	6 Marks	L3	CO1	PO1 PO2
	b)	Reduce the differential equation $x^2\frac{d^2y}{dx^2} - 4x\frac{dy}{dx} + 6y = x^2$ into linear equation with constant coefficients and find its general solution .	6 Marks	L2	CO1	PO1 PO2
		UNIT-II				
3.	a)	Construct the partial differential equation by eliminating arbitrary functions f and g from the relation $z = y f(x) + x g(y)$.	6 Marks	L3	CO1	PO1
	b)	Solve $(x^2 - y^2 - z^2)p + 2xyq = 2xz$.	6 Marks	L3	CO1	PO2
		(OR)				
4.	a)	Solve the partial differential equation $\frac{\partial^2 z}{\partial x^2} + \frac{\partial^2 z}{\partial x \partial y} - 6\frac{\partial^2 z}{\partial y^2} = \cos(2x + y)$.	6 Marks	L3	CO1	PO1 PO2
	b)	Solve $\frac{\partial u}{\partial x} = 4\frac{\partial u}{\partial y}$ given, $u(0, y) = 8e^{-3y}$ by method of separation of variables.	6 Marks	L3	CO1	PO1 PO2
		UNIT-III				
5.	a)	Given $u = \sin(x/y)$, $x = e^t$ and $y = t^2$, find $\frac{du}{dt}$ as a function of t. Compare the result by direct substitution.	6 Marks	L1	CO2	PO1
	b)	Define Jacobian for two variables and find the Jacobian of the variables $u = \frac{x+y}{1-xy}$ and $v = \tan^{-1}x + an^{-1}y$.	6 Marks	L1	CO2	PO1
		(OR)				
6.	a)	Find the maximum and minimum values of $x^3 + 3xy^2 - 15x^2 - 15y^2 + 72x$.	6 Marks	L3	CO2	PO1 PO2
	b)	A rectangular box is open at the top is to have volume of 32 cubic ft., find the dimensions of the box requiring least material	6 Marks	L4	CO2	PO1 PO2

for its construction.

UNIT-IV

7.	a)	Change the order of integration in $I = \int_0^1 \int_{x^2}^{2-x} xy\, dxdy$ and hence evaluate the same.	6 Marks	L3	CO2	PO1 PO2
	b)	Evaluate $\int_0^\infty \int_0^\infty e^{-(x^2+y^2)} dxdy$ by changing to polar coordinates.	6 Marks	L3	CO2	PO1 PO2

(OR)

8.	a)	Evaluate $\int_{-1}^{1} \int_{0}^{z} \int_{x-z}^{x+z} (x+y+z)\, dxdydz$.	6 Marks	L5	CO2	PO1
	b)	Find the area inside the circle $x^2 + y^2 = 4$ and outside the circle $x^2 + y^2 = 2x$ in the first quadrant.	6 Marks	L3	CO2	PO1 PO2

UNIT-V

9.	a)	Show that $\nabla^2(r^n) = n(n+1)\, r^{n-2}$	6 Marks	L5	CO3	PO1
	b)	Determine directional derivative of $f = x^2 - y^2 + 2z^2$ at the point $P(1,2,3)$ in the direction of the line PQ where Q is the point $(5,0,4)$.	6 Marks	L3	CO3	PO1

(OR)

10.		Verify Green's theorem for $\int_C (xy + y^2)dx + x^2 dy$, where C is bounded by $y = x$ and $y = x^2$.	12 Marks	L5	CO3	PO1 PO2

CODE No.: 19BT1BS03 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations, November - 2022

ENGINEERING PHYSICS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	In a Newton's ring experiment the diameter of the eighth ring has been found to be 0.42 cm and that of the 25th ring 0.84 cm. The radius of curvature of the plano convex lens is 95 cm. Determine the wavelength of light used.	4 Marks	L3	CO1	PO2
	b)	Explain the formation of Newton's rings. Determine the wavelength of sodium light using Newton's rings experiment.	8 Marks	L3	CO1	PO1 PO2
		(OR)				
2.	a)	Derive the condition for obtaining minima for the diffraction pattern due to a single slit.	8 Marks	L1	CO1	PO1
	b)	List the differences between half wave plate and quarter wave plate.	4 Marks	L1	CO1	PO2
		UNIT-II				
3.	a)	For a scalar field V, Show that $\nabla \times \nabla V = 0$.	8 Marks	L2	CO2	PO2
	b)	Write Maxwell's equations in differential form.	4 Marks	L3	CO2	PO1
		(OR)				
4.	a)	Define acceptance angle and numerical aperture of an optical fiber. Derive the expression for numerical aperture of an optical fiber.	7 Marks	L2	CO2	PO2
	b)	Explain how optical fibers are used in communication with a block diagram.	5 Marks	L2	CO2	PO2
		UNIT-III				
5.	a)	Distinguish between conductors, semiconductors and insulators.	6 Marks	L2	CO3	PO1
	b)	Derive an expression for density of holes in the valence band of an intrinsic semiconductor.	6 Marks	L3	CO3	PO1
		(OR)				
6.	a)	Discuss the dependence of Fermi energy on carrier concentration and temperature.	6 Marks	L3	CO3	PO1 PO2
	b)	What is drift current? Derive the expression for drift current density.	6 Marks	L3	CO3	PO1
		UNIT-IV				
7.	a)	What is electronic polarization? Derive the expression for electronic polarizability.	7 Marks	L1	CO4	PO1
	b)	What are piezoelectric materials? Write the applications of dielectrics.	5 Marks	L2	CO4	PO1 PO2
		(OR)				
8.	a)	A magnetic material has a magnetization of 2300 A/m and produces a flux density of 0.00314Wb/m². Calculate relative permeability of the material.	4 Marks	L1	CO4	PO1
	b)	What is Hysteresis? Explain hysteresis loop with a neat diagram.	8 Marks	L3	CO4	PO1

UNIT-V

9.	a)	Briefly explain the BCS theory of superconductivity.	8 Marks	L1	CO5	PO1
	b)	What are the critical parameters of a superconductor?	4 Marks	L1	CO5	PO1
		(OR)				
10.	a)	What are nano materials? Write its properties.	8 Marks	L1	CO5	PO1
	b)	Explain, why the properties of nano materials are different from that of bulk.	4 Marks	L1	CO5	PO1

CODE No.: 19BT1BS04 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations, November - 2022

ENGINEERING CHEMISTRY

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the stability of benzene with π-molecular orbitals.	6 Marks	L2	CO1	PO1
	b)	Identify the magnetic behavior of nitric oxide molecule based on its energy level diagram.	6 Marks	L3	CO1	PO1 PO2
		(OR)				
2.		Discuss the postulates of molecular orbital theory.	12 Marks	L2	CO1	PO1
		UNIT-II				
3.		Define sterilization of water. Explain the sterilization of water by using chlorine and ozone.	12 Marks	L2	CO2	PO1 PO2 PO6
		(OR)				
4.		List the adverse effect of fluorides on human health. Explain the Nalgonda defluoridation method.	12 Marks	L2	CO2	PO1 PO6
		UNIT-III				
5.	a)	Describe the construction and working of lithium ion battery and identify its advantages over lead acid battery.	8 Marks	L2	CO3	PO1
	b)	Write a short note on methanol-oxygen fuel cell and its net reaction.	4 Marks	L1	CO3	PO1
		(OR)				
6.	a)	Explain the protection of underground pipelines and cables from corrosion.	7 Marks	L2	CO3	PO1 PO2
	b)	Write the differences between dry corrosion and wet corrosion.	5 Marks	L2	CO3	PO1
		UNIT-IV				
7.	a)	Explain different types of fundamental modes of vibrations.	6 Marks	L2	CO4	PO1
	b)	Write the principle and applications of Scanning Electron Microscope.	6 Marks	L1	CO4	PO1
		(OR)				
8.		Discuss the principle and working of a UV- Visible spectrometer with the help of a block diagram.	12 Marks	L2	CO4	PO1 PO5
		UNIT-V				
9.	a)	Write an explanatory note on solid and semi-solid lubricants.	8 Marks	L2	CO5	PO1
	b)	List the difference between fluid film lubrication and boundary lubrication.	4 Marks	L1	CO5	PO1
		(OR)				
10.	a)	Discuss various advantages of liquid fuels over solid fuels.	4 Marks	L2	CO5	PO1
	b)	A coal has following composition by weight C = 90**%**, O = 3**%**, S =0.5**%**, N = 0.5**%** and ash = 2.5**%**. Net calorific value of the coal was found to be 8490 kcal/kg. Calculate the high calorific value of coal.	8 Marks	L3	CO5	PO2

❀ ❀ ❀

CODE No.: 19BT10501 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations, November - 2022

PROGRAMMING FOR PROBLEM SOLVING

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Describe the efficiency of algorithms with suitable examples.	6 Marks	L2	CO1	PO1
	b)	List and explain about the data types in Python.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Write a short notes on the following concepts: i) Implicit line joining ii) Explicit line joining	6 Marks	L1	CO1	PO1
	b)	Define variable. Explain identifier rules.	6 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Write a Python script to print factorial of a given number.	6 Marks	L3	CO1	PO2
	b)	Display the following pattern using Python script. 2345 1345 1245 1235 1224	6 Marks	L3	CO1	PO2
		(OR)				
4.	a)	Write a Python script to print list of prime numbers within a range.	6 Marks	L3	CO1	PO2
	b)	Specify the usage of **pass**, **break**, **continue** statements.	6 Marks	L2	CO1	PO1
		UNIT-III				
5.	a)	Compose a Python script to perform matrix multiplication.	6 Marks	L3	CO1	PO2
	b)	Design a Python script to check balanced parenthesis of a given expression.	6 Marks	L3	CO1	PO3
		(OR)				
6.	a)	Write a Python script to search a key element in the given list of elements.	6 Marks	L3	CO1	PO2
	b)	Illustrate any four set operation functions with an example program.	6 Marks	L2	CO1	PO1
		UNIT-IV				
7.	a)	Explain different types of arguments in functions.	6 Marks	L2	CO2	PO1
	b)	Develop a Python script to copy data from one file to another file.	6 Marks	L3	CO2	PO2
		(OR)				
8.	a)	Define scope and explain usage of global keyword.	6 Marks	L2	CO2	PO1
	b)	List and explain any four built-in functions in **numpy**.	6 Marks	L1	CO2	PO1

UNIT-V

9.	a)	Draw a scatter plots for knowing the relationship between two numerical variables.	6 Marks	L3	CO2	PO3
	b)	Write a Python script to drop the missing data from data frame.	6 Marks	L3	CO2	PO2

(OR)

10.	a)	Consider data frame contains student marks information. Write a Python script to display student details whose marks <60.	6 Marks	L3	CO2	PO3
	b)	Write a Python script to print information and frequency counts of a data set.	6 Marks	L3	CO2	PO2

CODE No.: 14BT30104 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations November - 2022

FLUID MECHANICS-I

[CIVIL ENGINEERING]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 Define the terms Specific weight, Capillarity, Viscosity and Specific volume and the specific gravity of a liquid is 3.0. What are its specific weight, specific mass and specific volume? 14 Marks

(OR)

2 Derive expressions for total pressure and centre of pressure for vertically immersed plane surface. A circular plate 2.5 m diameter is immersed in water, its greatest and least depths below the free surface being 3m and 1 m respectively, Find; 14 Marks

i) Total pressure on one face of the plate
ii) The position of centre of pressure.

UNIT-II

3 a) Define Steady flow and unsteady flow. 6 Marks

b) Show that $=x^2 - y^2$ represents on two dimensional irrotational flow. Find the potential function. 8 Marks

(OR)

4 a) What type of acceleration is to be expected if: 8 Marks

i) Stream lines are parallel and equidistant
ii) Stream lines are straight and converging
iii) Stream lines are curved but equispaced
iv) Stream lines are curved and converging

b) Derive the equation for a stream line. 6 Marks

UNIT-III

5 Derive an expression for loss of head due to sudden enlargement and find the head lost due to friction in a pipe of diameter 360 mm and length 60 m through which water is flowing at a velocity of 2.5 m/s using Darcy formula and Chezy's formula for which C=60. Assume kinematic viscosity as 0.01 stoke. 14 Marks

(OR)

6 Differentiate between notch and weir and A discharge of 0.06 cumec was measured over right angled notch. While measuring the head over the notch, an error of 1.5 mm was made. Determine the percentage error in the discharge, if coefficient of discharge of notch is 0.6. 14 Marks

UNIT-IV

7	Find the pressure gradient along flow, the average velocity and the discharge for an oil of viscosity 0.02 Ns/m^2 flowing between two stationary parallel plates 1m wide maintained 10mm apart. The velocity mid way between the plates is 2m/s.	14 Marks

(OR)

8	Explain Reynolds's experiment and describe the relation between flow through parallel plates.	14 Marks

UNIT-V

9	The pressure difference in a pipe of diameter and length due to turbulent flow depends on the velocity, viscosity, density and roughness. Using Buckingham's pi theorem, obtain an expression for pressure difference.	14 Marks

(OR)

10	Define similitude and types of similarities and In the model test of a spillway the discharge and velocity of flow over the model were 2.5 cumec and 1.5 m/s respectively. Calculate the velocity and discharge over the prototype which is 36 times the model size.	14 Marks

CODE No.: 16BT3BS01 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations, November 2022

PROBABILITY DISTRIBUTIONS AND STATISTICAL METHODS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science Systems Engineering]

Max. Marks: 70

Time: 3 hours

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Define discrete random variable and probability mass function. CO1 4 Marks

b) The following probability function is given by CO4 10 Marks

X	-3	-2	-1	0	1	2	3
P(x)	0.05	0.10	2k	0	0.3	k	0.10

Compute

i) K; ii) Find mean of X; iii) E(2x + 3);
iv) Variance of X.

(OR)

2 a) A continuous random variable X has a probability density function $f(x) = 3x^2$, $0 \le x \le 1$. Find a and b such that : CO5 7 Marks
i) $P(X \le a) = P(X > ab)$ and ii) $P(X > b) = 0.05$.

b) If the probability density function of a random variable is $f(x) = kx^3$, $0 \le x \le 1$. Find the value of k and the probability that this random variable will take on a value; CO4 7 Marks

i) Between ¼ and ¾
ii) Greater than 0.66
iii) Less than 0.8.

UNIT-II

3 a) The sum and product of the mean and variance of a Binomial distribution are 15 and 50 respectively; find $P(X \ge 1)$. CO4, CO5 7 Marks

b) If X is a random variable which follows normal distribution with mean 30 and standard deviation 5, Find the probabilities that CO4 7 Marks

i) $26 \le X \le 40$ ii) $X \ge 45$ iii) $|X - 30| > 5$

(OR)

4 a) If a random variable has a Poisson distribution such that $P(X = 1) = P(X = 2)$, then find; CO4 7 Marks
i) Mean ii) $P(X = 4)$ iii) $P(X \ge 1)$.

b) A marksman has a probability of 0.9 of hitting a target on a single shot. If the marksman has 40 shots, what is the probability that he hits the target CO4 7 Marks

i) At least 35 times
ii) Between 34 and 36 times
iii) At most 37 times.

UNIT-III

5 Construct the Mean and Range charts from the following data and comment on the process. CO2, CO3 14 Marks

Sample No.	1	2	3	4	5	6	7	8	9	10
Sample Mean	15	17	15	18	17	14	18	15	17	16
Sample Range	7	7	4	9	8	7	12	4	11	5

(OR)

6 The expenditure (x) and annual profits(y) of a company are given for the last 8 years. Find both the regression lines and estimate Y if $X = 6$. CO1, CO2 14 Marks

Year	2008	2009	2010	2011	2012	2013	2014	2015
X	9	7	5	10	4	5	3	2
Y	45	42	41	60	30	34	25	20

UNIT-IV

7 a) A sample of 400 individuals is found to have a mean height of 67.47 inches. Is it reasonable to regard the sample drawn from the large population with mean height 67.39 inches and standard deviation of 1.3 inches. Justify your answer. CO1, CO4 7 Marks

b) In a sample of 1000 people in a state, 470 were found to be rice consumers and the rest wheat consumers. Can we conclude that the food items are equally popular? Justify your answer. CO2 7 Marks

(OR)

8 a) A company claims that its light bulbs are superior to those of its main competitor. If a study showed that n_1=40 of its bulbs has a mean life time of 647 hours with a standard deviation of 27 hours, while a sample of n_2=40 from its main competitor has a mean lifetime of 638 hours with a standard deviation 31 hours, does this data substantiate the claim? Justify your answer. CO1, CO4 7 Marks

b) In a sample of 600 men from a certain city, 450 men are found to be smokers. In a sample of 900 from another city 450 are found to be smokers. Do the data indicate that the two cities are significantly different with respect to prevalence of smoking habit among men? Justify your answer. CO2 7 Marks

UNIT-V

9 a) A random sample of 8 envelopes is taken from a letter box of a post office and their weights in grams are found to be 12.1, 11.9, 12.4, 12.3, 11.9, 15.4, 13.9, and 12.8. and 99% confidence interval for the population mean weight of the envelopes received at that post office. CO4 7 Marks

b) Two independent random samples of 8 and 7 items respectively have the following values CO4 7 Marks

Sample 1	9	11	13	11	15	9	12	14
Sample 2	10	12	10	14	9	8	10	---

Test whether the difference between the variances is significant at 1% level of significance?

(OR)

10 To determine whether there is really a relationship between employee's performance in the company's training program and his success in the job, a sample of 400 cases were taken and the following results were obtained. Test at 1% level of significance whether the performance in the training program and success in the job are independent. CO4 14 Marks

Success in Job	Performance in training program		
	Below Average	Average	Above Average
Poor	23	60	29
Average	28	79	60
Very Good	9	49	63

❀ ❀ ❀

CODE No.:16BT3HS02 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations November - 2022

MANAGERIAL ECONOMICS AND PRINCIPLES OF ACCOUNTANCY
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Explain the nature and scope of Managerial Economics.	CO1	14 Marks
		(OR)		
2		What is Demand? Discuss the determinants of demand.	CO3	14 Marks

UNIT-II

3		Explain about input – output relationship in production.	CO1	14 Marks
		(OR)		
4	a)	Write the merits and demerits of Break Even Analysis.	CO2, CO3	7 Marks
	b)	From the following particulars calculate the Break-even point in terms of both quantity and value: Production in units 20,000 Sales price Rs.5.00 per unit Variable costs Rs.40,000 Fixed costs Rs.15,000	CO2, CO3	7 Marks

UNIT-III

5		Define market structure. Describe the features of perfect competition.	CO3	14 Marks
		(OR)		
6		Explain the following: i) Marginal cost pricing ii) Penetration pricing iii) Skimming pricing	CO3	14 Marks

UNIT-IV

7		Distinguish between Journal and Ledger with an example.	CO1, CO4	14 Marks
		(OR)		
8		Define capital and explain its significance.	CO1, CO5	14 Marks

UNIT-V

9		Write and explain the steps in the preparation of final accounts.	CO1, CO4	14 Marks
		(OR)		

10 From the following balances of Ravi, prepare Trading A/c, Profit and Loss A/c for the year ending 31st March, 2019 and Balance Sheet as on that date. CO4, CO5, CO6 14 Marks

	Rs.		Rs.
Purchases	14,000	Commission Received	1,000
Sales	28,800	Debtors	5,000
Opening Stock	3,000	Salaries	4,800
Machinery	8,000	Insurance	1,200
Cash	2,000	Buildings	15,000
Creditors	1,500	Bills Payable	2,000
Wages	3,000	Furniture	500
Printing & Stationery	1,700	Interest Received	800
Capital	25,000	Patents	4,000
Factory Rent	300	Bank overdraft	3,400

Adjustments:

1. Closing stock Rs.5,500
2. Outstanding Printing charges Rs.300
3. Insurance paid in advance Rs.200
4. Unpaid wages Rs.500

CODE No.:16BT30102 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations, November – 2022

FLUID MECHANICS AND HYDRAULIC MACHINERY

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the properties of fluids? 3 liter petrol weighs 21N. Calculate i) specific weight ii) density iii) specific volume and iv) specific gravity.	CO1	7 Marks
	b)	A U-tube differential manometer connects two pressure pipes A and B. Pipe A contains carbon tetrachloride having a specific gravity 1.594 under a pressure of 11.772 N/ cm^2 and Pipe B contains oil of specific gravity 0.9 under a pressure of 12 N/cm^2. The pipe a lies 2.5m above pipe B. Find the difference of pressure measured by mercury as fluid filling U-tube.	CO2	7 Marks

(OR)

2	a)	Will you state pascal's law in your own words? What is the pressure, in meters of oil (Sp.gr. 0.8), equivalent to 80 m of water?	CO1	7 Marks
	b)	A blower delivers 8 m^3 air per sec at 27^0 C and one atmospheric pressure (1 bar). Find mass of the air delivered if molecular weight of the air is 30. Also find (i) density (ii) specific volume and (iii) specific weight of the air being supplied.	CO2	7 Marks

UNIT-II

3	a)	Define steady, non-steady, uniform, non-uniform flows? The stream function for a two-dimensional flow is given by $\psi = 3xy$, calculate the velocity at the point P (2, 3). Find the velocity potential function Φ.	CO2	7 Marks
	b)	In a fluid, the velocity field is given by, $V = (3x + 2y)\,i + (2z + 3x^2)\,j + (2t - 3z)k$. Determine: i) The velocity components u, v, w at any point in the flow field. ii) The speed at point (1, 1, 1). iii) The speed at time t = 2 sec at point (0, 0, 2).	CO2	7 Marks

(OR)

4	a)	Develop the Euler's equation of motion and then derive Bernoulli's equation. List all some practical applications	CO2	7 Marks
	b)	Water flows in a circular pipe. At one section, the diameter is 0.3 m, the static pressure is 260 Kpa gauge, the velocity is 3m/s and the elevation is 10 m above ground level. The elevation at a section downstream is 0 m, and the pipe diameter is 0.15 m. Find the gauge pressure at the downstream section. Frictional effects may be neglected. Assume density of water to be 999 kg/m^3	CO2	7 Marks

UNIT-III

5	a)	Derive Darcy-Weisbach formula for calculating loss of head due to friction in a pipe. Water flows through a pipe of diameter 300mm with a velocity of 5m/s. If the co-efficient of friction is given by $f = 0.015 + \frac{0.08}{Re^{0.3}}$ where Re is the Reynolds number, estimate the head lost due to friction for a length of 10m. Take kinematic viscosity of water as 0.01 stoke.	CO3	7 Marks

	b)	Derive an expression for the head loss due to sudden enlargement in pipe flow Water flows through a pipe line whose diameter various from 25 cm to 15 cm in a length of 10 m. If the Darcy-Weisbach friction factor is assumed constant at 0.018 for the whole pipe, estimate the head loss in friction when the pipe is flowing full with a discharge of $0.06m^3$/sec.	CO3	7 Marks
		(OR)		
6	a)	Describe Buckingham's theorem? Why this theorem is considered superior to Rayleigh's method for dimensional analysis.	CO4	7 Marks
	b)	The drag force F on a partially submerged body depends on the relative velocity V between the body and the fluid, characteristics linear dimension *l*, height of surface roughness k, fluid density ρ , the viscosity μ and acceleration due to gravity g. Obtain an expression for the drag force using the method of dimensional analysis.	CO4	7 Marks
		UNIT-IV		
7	a)	In a tabular form write the types of channel slopes and corresponding possible channel profiles. Also indicate conditions under which they occur.	CO5	7 Marks
	b)	At a certain section M in a rectangular channel of bed width 2 m, the depth of flow is 1.20 m. When the flow rate is 6.0 m3/sec, estimate the distance from M to another section N where the depth is 1.40m. The bed slope is 0.002 and Manning's n = 0.015. Take two steps.	CO5	7 Marks
		(OR)		
8	a)	Derive the dynamic equation of gradually varied flow. What are the assumptions in the analysis of gradually varied flow?	CO5	7 Marks
	b)	Determine the slope of the free water surface in a rectangular channel of width 20 m, having depth of flow 5 m. The discharge through the channel is 52 cumecs. The bed slope of the channel is 1 in 4000. Assume Chezy,s constant C as 60.	CO5	7 Marks
		UNIT-V		
9	a)	Show that the efficiency of a free jet striking normally as series of flat plates mounted on the periphery of a wheel never exceeds 50%	CO3	7 Marks
	b)	A jet of water of diameter 60 mm moving with a velocity of 40 m/s, strikes a curved fixed plate tangentially at one end at an angle of 30^0 to horizontal. The jet leaves the plate at an angle of 20^0 to the horizontal. Find the force exerted by the jet on the plate in the horizontal and vertical directions.	CO3	7 Marks
		(OR)		
10	a)	Derive an expression for the work done by the impeller of a centrifugal pump on liquid per second per unit weight of lquid. Explain briefly manometric and volumetric efficiencies of a centrifugal pump	CO1	7 Marks
	b)	An inward flow reaction turbine operating under 30 m head, develops 4000 KW while running at 300 rpm. The overall efficiency of the turbine is 0.85; the hydraulic efficiency is 0.9; and the radial velocity of flow at inlet is 7 m/s; the inlet guide vane angle at full gate opening is 30^0. Calculate the diameter and width of the runner at inlet. Blade thickness coefficient is 5 %.	CO2	7 Marks

❀ ❀ ❀

CODE No.:16BT30103 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations, November – 2022

MECHANICS OF SOLIDS
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	A bar of 25mm diameter is tested in tension. It is observed that when a load of 60 KN is applied, the extension measured over a gauge length of 200 mm is 0.12 mm and contraction in diameter is 0.0045 mm. Determine the i) Poisson's ratio ii) Young' Modulus iii) Shear Modulus iv) Bulk Modulus.	CO1	7 Marks
	b)	A mild steel rod of 25mm diameter and 400 mm long is encased centrally inside a hollow copper tube of external diameter 35 mm and inside diameter 30 mm. The ends of the rod and tube are rigidly attached, and the composite bar is subjected to an axial pull of 40KN.If Young's modulus for steel and copper is 200 GN/m^2 and 100 GN/m^2 respectively. Find the i) Stresses developed in the rod and the tube and ii) Extension of the rod	CO2	7 Marks

(OR)

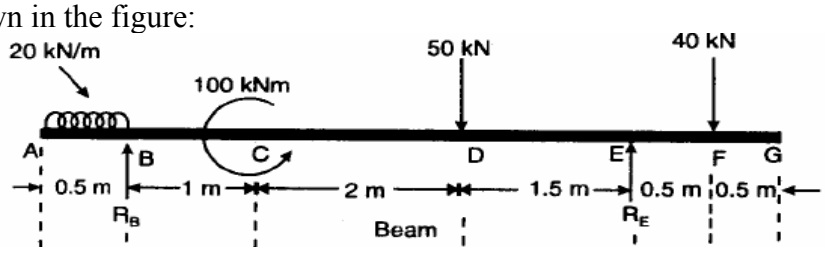
2	a)	A load of 100 N falls through a height of 20mm on to a collar rigidly attached to the lower end of a vertical bar 1.5m long and of 15000 mm^2 cross sectional area. The upper end of the vertical bar is fixed. Take E=200 GPa. Determine the: i) Maximum instantaneous stress induced in the vertical bar. ii) Maximum instantaneous elongation and. iii) Strain energy stored in the vertical rod.	CO2	10 Marks
	b)	Two tapering bars of the same material are subjected to a tensile load P. The lengths of both the bars are the same. The larger diameter of each of the bars is D. The diameter of the bar A at its smaller end is D/2 and that of the bar B is D/3. What is the ratio of elongation of the bar A to that of the bar B?	CO1	4 Marks

UNIT-II

3		A cantilever beam 5m long carries concentrated loads of 30kN, 40kN and 50 KN at distances of 1.5m, 3 m and 4.5m from the fixed end. In addition to this the beam carries a uniformly distributed load of 10 kN/m over the entire length of the beam. Draw the SFD and BMD.	CO2	14 Marks

(OR)

4		Construct the Shear force and Bending moment diagrams for the beam as shown in the figure:	CO2	14 Marks



UNIT-III

5		A T-section has a flange width of 200 mm and overall depth of 150 mm and thickness 20mm. If it is subjected to a shear force of 120kN at a section, Find the maximum intensity of stress and also draw the shear stress distribution diagram.	CO1	14 Marks

(OR)

6		A masonry chimney 24 meters high, of uniform circular section,3.5 meters external diameter and 2m internal diameter is subjected to a horizontal wind pressure of 1 KN/m^2 of projected area. Find the maximum and minimum stress intensities at the base, if the specific weight of masonry is $22KN/m^3$.	CO5	14 Marks

UNIT-IV

7		In a torsion test, the specimen is a hollow shaft with 50 mm external and 30 mm internal diameter. An applied torque of 1.6 kN-m is found to produce an angular twist of 0.4^0 measured on a length of 0.2 m of the shaft. The Young's modulus of elasticity obtained from a tensile test has been found to be 200 GPa.Find the values of (i) Modulus of rigidity (ii) Poisson's ratio	CO1	14 Marks

(OR)

8	a)	A closed coil helical spring is subjected to an axial load of 300 N having 12 coils of wire diameter of 16 mm and made with coil diameter of 250m. Determine the i) Axial Deflection. ii) Strain energy stored. iii) Maximum torsional shear stress in the wire.	CO4	10 Marks
	b)	A closed coil helical spring is to carry a load of 500 N. Its mean coil diameter is to be 10 times that of the wire diameter. Calculate the wire diameter and mean diameter of the spring if the maximum shear stress In the material of the spring is to be 80 MN/mm^2.	CO3	4 Marks

UNIT-V

9	a)	A thin cylindrical shell 3 m long which is closed as the ends has an internal diameter of 1 m and a wall thickness of 15 mm. Calculate the circumferential and longitudinal stresses induced and also changes in the dimensions of the shell, if it is subjected to an internal pressure of 1.5 N/mm^2. Take $E=2x10^5$ N/mm^2 and $\mu=0.25$.	CO3	10 Marks
	b)	A thin walled water pipe carries water under a pressure of 2 N/mm^2 and discharges water into a tank. Diameter of the pipe is 25 mm and thickness is 2·5 mm. What is the longitudinal stress induced in the pipe?	CO1	4 Marks

(OR)

10		Differentiate between thin cylinders and thick cylinders. Derive an expression for the radial pressure and hoop stress at any point in case of thick cylinders.	CO6	14 Marks

❀ ❀ ❀

CODE No.:16BT30202 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations, November – 2022

ELECTROMAGNETIC FIELDS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Three equal point charges of 2 μC are in free space at (0, 0, 0), (2, 0, 0) and (0, 2, 0). Determine the net vector force on 5 μC at (2, 2, 0).	CO1	7 Marks
	b)	Evaluate the electric field $\vec{E}$ at the general point P due to charge distributed uniformly along an infinite straight line with charge density ρ_l.	CO3	7 Marks
		(OR)		
2	a)	A point charge of 6μC is located at the origin, a uniform line charge density of 180nC/m lies along the x-axis, and a uniform sheet of charge equal to 25nC/m^2 lies in the z=0 plane. Determine D at A (0,0,4).	CO1	9 Marks
	b)	Derive Laplace's and Poisson's equation from Maxwell's first equation.	CO4	5 Marks

UNIT-II

3	a)	Illustrate Conduction, convection and displacement currents and current densities.	CO2	6 Marks
	b)	A large parallel plate capacitor has its plates normal to the x-axis. Plate 1 with potential v = 0 is at x = 0. Plate 2 with a potential v = v_1 at x = x_1. Use Laplace's equation for the capacitor to show that the potential distribution is given by V = (v_1/x_1) x volts.	CO3	8 Marks
		(OR)		
4	a)	Derive continuity equation and explain the terms in the equation.	CO1	6 Marks
	b)	Conducting spherical shells with radii a = 10cm and b = 30cm are maintained at a potential difference of 100V such that V(r=b) = 0 and V(r=a) = 100V. Determine V and E in the region between the shells. If ε_r=2.5 in the region, determine the total charge induced on the shells and the capacitance of the capacitor.	CO3	8 Marks

UNIT-III

5	a)	State Biot-Savart's law and deduce an expression for $\vec{H}$ at a point located at a distance of ***r*** metres from an infinitely long straight conductor carrying ***I*** amperes	CO5	9 Marks
	b)	State and explain Amperes circular law with applications.	CO4	5 Marks
		(OR)		
6	a)	For a coaxial cable, apply Amperes law to derive expressions for **H** and plot **H** with respect to distance.	CO5	8 Marks
	b)	Explain scalar and vector magnetic potentials.	CO2	6 Marks

UNIT-IV

7	a)	Derive the expression for inductance of a coil and energy density in the magnetic field.	CO2	8 Marks
	b)	A coil of 300 turns is wound on a non-magnetic core having a mean circumference of 300 mm and a cross-sectional area of 300 mm^2. Determine the inductance of the coil corresponding to a magnetizing current of 3A.	CO3	6 Marks

(OR)

8	a)	In free space, E= 20cos(wt-50x) a_y V/m. calculate (i) Displacement current density (J_d); (ii) H	CO3	7 Marks
	b)	Discuss the force excreted on a current element due to a magnetic field B in another current element	CO2	7 Marks

UNIT-V

9	a)	Write Maxwell's equations for time varying EM fields in both differential and integral form.	CO4	8 Marks
	b)	An a c. voltage source V = V_o sinωt is connected across a parallel plate capacitor C. Verify that displacement current in the capacitor is same as the conduction current in the wires.	CO3	6 Marks

(OR)

10	a)	Derive an expression Displacement current density J_d, and also give the physical interpretation of Maxwell's Equations.	CO2	7 Marks
	b)	Derive boundary conditions between two perfect dielectrics in a magnetic field.	CO5	7 Marks

CODE No.:16BT30203 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations, November – 2022

SIGNALS, SYSTEMS AND NETWORKS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

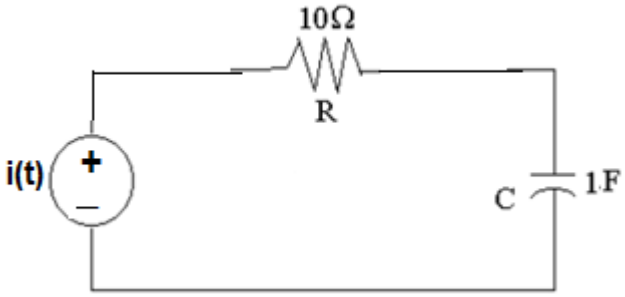
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define terms linearity, causality and time invariance.	CO1	6 Marks
	b)	Discriminate periodic and non-periodic signal and check the signal given is periodic or not $y(t)=5\cos(17\pi t+\pi/4) + 7\sin(21\pi t - \pi/4)$.	CO2	8 Marks
		(OR)		
2	a)	Determine the unit response of the following system whose impulse response is $h(t) = e^{-2t}u(t-3)$.	CO2	8 Marks
	b)	Determine the complete response of the system defined by the differential equation $\frac{d^2x(t)}{dt} + 6\frac{dx(t)}{dt} + 5x(t) = \frac{du(t)}{dt}$ with $x(0) = 2$ and $\frac{dx(0)}{dt} = 1.5$ for the input $u(t)=e^{-3t}$.	CO4	6 Marks

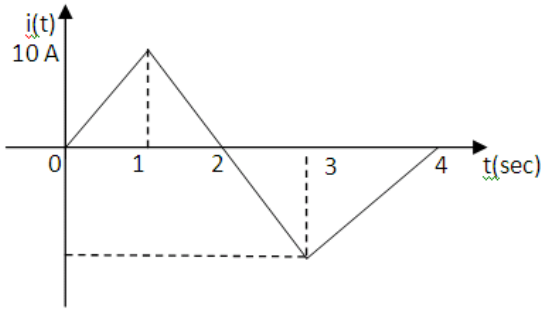
UNIT-II

3	a)	State the need of Fourier series and Fourier Transform in circuit analysis.	CO2	6 Marks
	b)	Determine the voltage output across capacitor v(t), if the source of current applied to circuit is $i(t) = 2 + 5(\cos t + \cos 2t + \cos 3t + \cos 4t + \cos 5t)$ as shown in figure using Fourier Transform.	CO4	8 Marks



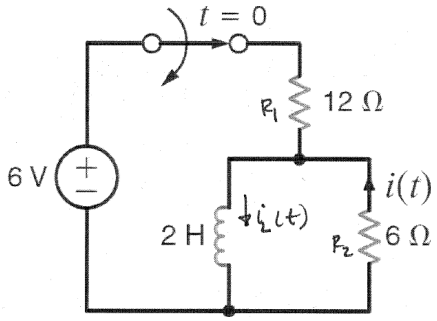
(OR)

4	a)	State and explain the convolution theorem in Laplace Transform.	CO1	6 Marks
	b)	The periodic current waveform shown in figure is applied across a 5 kΩ resistor. Find the average power dissipated and also compare with DC power of magnitude same as peak value.	CO4	8 Marks



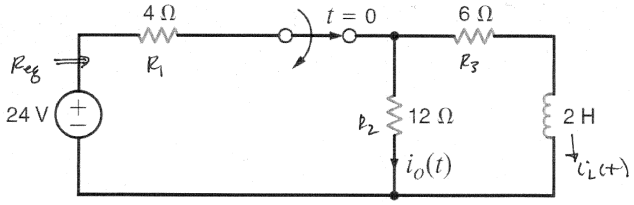
UNIT-III

5	a)	What are final value conditions? Explain the procedure to evaluate final value conditions.	CO1	6 Marks
	b)	Compute the response $i_L(t)$ for $t > 0$. Plot the response including the time interval just prior to switch action.	CO4	8 Marks

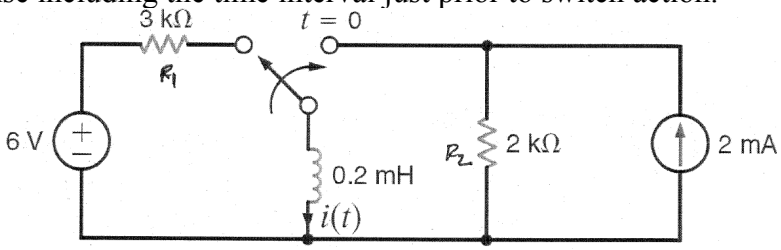


(OR)

6 a) Compute the response of the circuit shown below $i_0(t)$ for t > 0. CO4 7 Marks

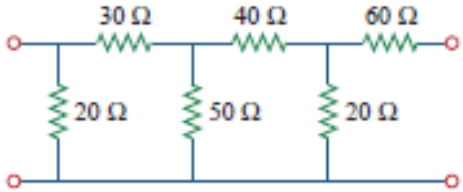


b) Compute the response of i(t) for t > 0 in circuit shown below. Plot the response including the time interval just prior to switch action. CO4 7 Marks

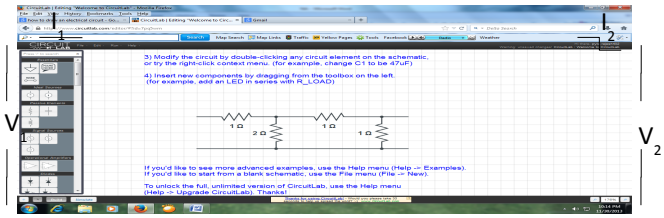


UNIT-IV

7 a) Compute the open circuit parameters of two port network shown in figure. CO4 7 Marks

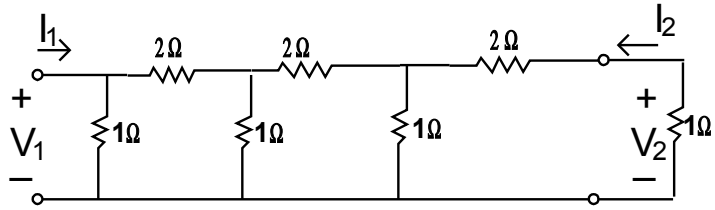


b) Find the ABCD and H parameters for the circuit below. CO4 7 Marks

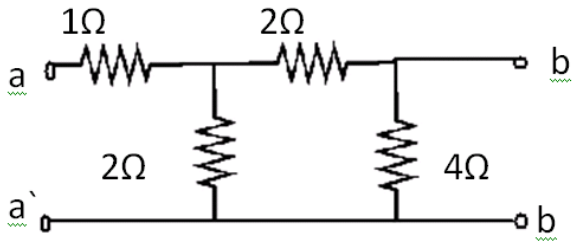


(OR)

8 a) For the resistive two port network shown in Figure, Find the Voltage and current ratio transfer function $G_{12} = \frac{V_2}{V_1}$ *and* $\alpha_{12} = \frac{I_2}{I_1}$ respectively. CO3 7 Marks

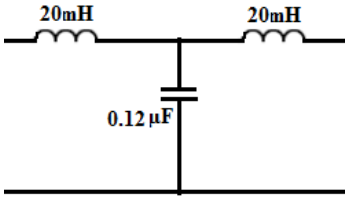


b) Compute the Y and T parameters of the two port network shown in figure. CO3 7 Marks



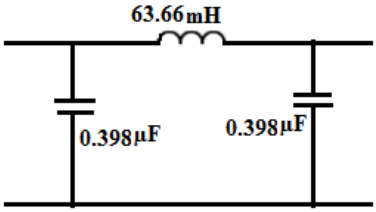
UNIT-V

9	a)	Compute the Characteristic impedance of T and π prototypes at 2.5 kHz and 5 kHz of high pass filter with cutoff frequency 2 kHz and nominal characteristic impedance is 500 Ω.	CO3	6 Marks
	b)	A T-section filter is shown in fig. Calculate the value of cutoff frequency and determine the iterative impedance and the phase shift of the network at 1.5 kHz.	CO3	8 Marks



(OR)

10	a)	Why the preference given for reactive elements in passive filter design, rather than resistive elements.	CO2	4 Marks
	b)	A π-section filter is shown in fig. Calculate the value of cutoff frequency and determine the iterative impedance and the phase shift of the network at 1.25 kHz.	CO6	10 Marks



CODE No.: 16BT30301 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations November - 2022

ENGINEERING METALLURGY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Describe in detail basic open hearth process.	CO3	7 Marks
	b)	Discuss in detail the working of puddling furnace.	CO5	7 Marks
		(OR)		
2		Explain the following: i) Vacuum induction melting. ii) Electric furnace melting.	CO3	14 Marks
		UNIT-II		
3		Explain eutectic and peritectic reactions with neat phase diagrams.	CO2	14 Marks
		(OR)		
4		What is phase diagram? Explain the importance of Gibbs phase rule.	CO6	14 Marks
		UNIT-III		
5	a)	Describe how TTT Curves are useful in the heat treatment process of steel.	CO3	7 Marks
	b)	Write a short notes on i) Process Annealing; ii) Hardening.	CO3	7 Marks
		(OR)		
6		Explain the following i) Tempering. ii) Austempering. iii) Martempering. iv) Age hardening.	CO3	14 Marks
		UNIT-IV		
7		Explain the following i) Carburizing; ii) Carbonitriding; iii) Cyaniding.	CO3	14 Marks
		(OR)		
8	a)	Explain about Optical Microscope.	CO5	7 Marks
	b)	Write differences between TEM and SEM.	CO5	7 Marks
		UNIT-V		
9	a)	Write the advantages and limitations of powder metallurgy.	CO6	7 Marks
	b)	Write about atomization process.	CO4	7 Marks
		(OR)		
10		Discuss the following terms i) Sintering; ii) Electrolysis process; iii) Mixing.	CO4	14 Marks

❀ ❀ ❀

CODE No.: 16BT30302 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations, November – 2022

KINEMATICS OF MACHINERY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

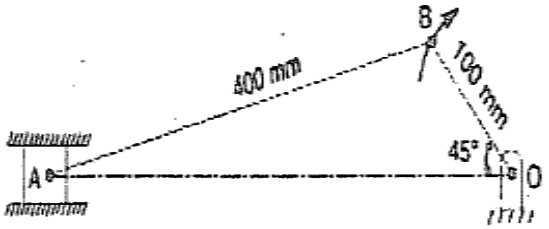
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define the following terms i) Element or link; ii) Kinematic chain; iii) Lower pair; iv) Higher pair.	CO1	4 Marks
	b)	Sketch and explain double slider crank mechanism	CO1	10 Marks
		(OR)		
2	a)	What is a machine? Differentiate between machine and structure?	CO1	4 Marks
	b)	Sketch and explain single slider crank chain.	CO1	10 Marks

UNIT-II

3		A four bar mechanism ABCD is made of four links. AD is fixed link which is 180 mm long. The links AB, BC and CD are 90 mm, 120 mm and 120 mm respectively. At a certain instant, the link AB makes 69^0 with link AD. If link AB rotates at uniform speed of 120 rpm, find: i) Angular velocities of links BC and CD. ii) Velocity of B and C.	CO2	14 Marks
		(OR)		
4		Locate all the instantaneous centres of the slider crank mechanism shown in following figure. The lengths of crank OB and connecting rod AB are 100 mm and 400 mm respectively. If the crank rotates clockwise with an angular velocity of 10 rad/s, find: i) Velocity of the slider A. ii) Angular velocity of the connecting rod AB.	CO2	14 Marks



UNIT-III

5		Sketch and explain Peaucellier straight-line mechanism. Prove that it generates exact straight line.	CO1	14 Marks
		(OR)		
6		Draw the neat sketch of Davis steering gear and show that exactly satisfies the condition for correct steering.	CO1	14 Marks

UNIT-IV

7		The following data refers to two mating 20^0 involute gears. Number of teeth on pinion is 20. Gear ratio = 2. Speed of pinion is 250 rpm. Module = 12mm. If the addendum of each wheel is such that the path of approach and path of recess on each side are half of the maximum permissible length, find : i) The addendum of pinion and gear. ii) The length of arc of contact.	CO3	14 Marks
		(OR)		

8	Two shafts A and B are coaxial. A gear C (50 teeth) is rigidly mounted on shaft A. A compound gear D-E gear with C and an internal gear G. D has 20 teeth and gears with C and E has 35 teeth and gear with an internal gear G which is fixed and is concentric with the shaft axis. The compound gear D-E is mounted on a pin which projects from an arm keyed to the shaft B. i) Sketch the arrangement. ii) Find the number of teeth on internal gear G assuming that all gears have the same module. iii) If shaft A rotates at 110 rpm find the speed of shaft B.	CO4	14 Marks

UNIT-V

9	A cam with minimum radius of 25 mm, rotating clockwise at uniform speed is to be designed to give a roller follower, at the end of a valve rod, motion described below: To raise the valve through 50 mm during 120^0 rotation of the cam, to keep the valve fully raised through next 30^0, to lower the valve during next 60^0 and to keep the valve closed during rest of the revolution i.e. 150^0. The diameter of the roller is 20 mm and the diameter of the cam shaft is 25 mm. Draw the profile of the cam when the line of stroke of the valve rod passes through the axis of the cam shaft. The displacement of the valve, while being raised and lowered, is to take place with simple harmonic motion. Determine the maximum acceleration of the valve rod when the cam shaft rotates at 100 rpm.	CO5	14 Marks

(OR)

10	Draw the profile of a cam operating a knife edge follower from the following data: i) Follower to move outward through 40 mm during 60^0 of a cam rotation, ii) Follower to dwell for the next 45^0 iii) Follower to return its original position during next 90^0 iv) Follower to dwell for the rest of the cam rotation. The displacement of the follower is to take place with SHM during both outward and return strokes. The least radius of the cam is 50 mm. If the rotates at 300 rpm, determine the maximum velocity and acceleration of the follower during the outward stroke and return stroke.	CO6	14 Marks

CODE No.: 16BT30303 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations, November – 2022

MANUFACTURING TECHNOLOGY

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Enumerate the procedure for sand mold making with neat sketch.	CO1	7 Marks
	b)	Explain any four types of patterns with neat sketches.	CO2	7 Marks
		(OR)		
2	a)	What are the essential properties of molding sand? Explain.	CO2	7 Marks
	b)	Explain the testing methods of mold sand.	CO4	7 Marks
		UNIT-II		
3	a)	Briefly explain the steps in sequence for shell molding process with an illustration.	CO5	7 Marks
	b)	What are the steps followed in the precision investment casting process? Explain.	CO5	7 Marks
		(OR)		
4	a)	Describe the continuous casting process with a neat sketch.	CO5	7 Marks
	b)	What are the various testing methods used for casting inspection? State their advantages and disadvantages.	CO4	7 Marks
		UNIT-III		
5	a)	Explain the process of hot working and cold working.	CO5	7 Marks
	b)	Elucidate the wire drawing process with a neat diagram.	CO1	7 Marks
		(OR)		
6	a)	State the types of dies used in sheet metal forming. Explain them with a neat sketch.	CO4	7 Marks
	b)	What is meant by HERF process? Explain the explosive forming process.	CO5	7 Marks
		UNIT-IV		
7	a)	Enumerate with neat sketches three types of flames used in gas welding.	CO4	7 Marks
	b)	Explain in detail about the TIG and MIG welding processes.	CO1	7 Marks
		(OR)		
8	a)	Describe the process of laser beam welding process and its merits.	CO4	7 Marks
	b)	Name some of the common welding defects and methods to overcome it.	CO4	7 Marks
		UNIT-V		
9	a)	What are the additives used in plastics materials? Describe them briefly.	CO5	7 Marks
	b)	Write short notes on thermoplastics and thermosetting materials.	CO5	7 Marks
		(OR)		
10	a)	Describe the process of blow molding in detail.	CO1	7 Marks
	b)	Explain the process of transfer molding with an illustration.	CO1	7 Marks

❀ ❀ ❀

CODE No.: 16BT30304 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations November – 2022

STRENGTH OF MATERIALS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the importance of stress strain diagram.	CO1	4 Marks
	b)	A 2 m long steel bar has a uniform diameter of 40 mm for a length of 1m from one end. For the next 0.5 m length the diameter decreases uniformly to d. For remaining 0.5 m length it has a uniform diameter of d mm. When a load of 150 KN is applied the observed extension is 2.4 mm. Determine the diameter d and stresses in each section. E = 200 KN/mm^2.	CO2	10 Marks
		(OR)		
2		A steel rod 20 mm in diameter passes centrally through a steel tube of 25 mm internal diameter and 30 mm external diameter. The tube is 800 mm long and is closed by rigid washers of negligible thickness which are fastened by nuts threaded on the rod. The nuts are tightened until the compressive load on the tube is 20 KN. Calculate the stresses in the tube and the rod. Find the increase in these stresses when one nut is tightened by one quarter of turn relative to other. There are 4 threads per 10 mm. E=200 GPa.	CO5	14 Marks

UNIT-II

3		A beam **6 m** long rests on two supports with equal overhangs on either side and carries a uniformly distributed load of **30 KN/m** over its entire length. Calculate the overhang if the maximum bending moment is to be as small as possible. Also draw shear force and bending moment diagrams.	CO6	14 Marks
		(OR)		
4		A horizontal beam AB 10 m long supported at two ends A and B carries a UDL of 180 N/ m from end A upto 3 m long in addition a concentrated load of 200 N at the left end, UDL of 200 N/m upto 4 m long from end B. Sketch the shear force and bending moment diagrams. Also, find the magnitude and position of maximum bending moment.	CO6	14 Marks

UNIT-III

5	a)	Find the width and depth of the strongest beam that can be cut of a cylindrical log of wood whose diameter is 600mm.	CO3	5 Marks
	b)	A water main of 1200 mm internal diameter and 12 mm thick is running full. If the stress is not to exceed 56 N/mm^2, find the greatest span which the pipe may be freely supported. Steel and water weigh 76800 N/m^3 and 10000 N/m^3 respectively.	CO3	9 Marks
		(OR)		
6	a)	Show that the maximum shear stress of solid circular section of a beam is equal to 1.333 times its mean shear stress.	CO3	5 Marks
	b)	The cross sectional area of a solid shaft of 160 mm diameter is the same as of a hollow shaft of the same material and of 120 mm inside diameter. Determine i) The ratio of power transmitted for the same angular velocity, ii) The ratio of angles of twist for the equal lengths when stressed to same intensity.	CO3	9 Marks

UNIT-IV

7		A horizontal beam, simply supported at its ends, carries a load which varies uniformly from 15 KN/m at one end to 60 KN/m at the other. Estimate the central deflection if the span is7m. E= 210 GPa and I=200x10^{-6} m.	CO4	14 Marks

(OR)

8		The direct stresses in two mutually perpendicular directions are 350 MPa and 250 MPa**,** both tensile and accompanied by the complimentary shear stress of intensity 200 MPa. Determine the magnitude of principal stresses and find the orientation of principal plane. Also find the stresses on the plane making an angle 60^0 with 350 MPa plane. Use Mohr's circle method.	CO4	14 Marks

UNIT-V

9	a)	Derive an expression for volumetric strain for a thin cylinder subjected to an internal pressure p	CO4	4 Marks
	b)	A closed end copper tube of 72 mm internal diameter, 800 mm long and 2 mm thick is filled with water under pressure. Find the change in pressure if additional volume of 4000 mm^3 of water is pumped into the tube. E= 102 GPa, K = 2200 MPa and Poissons ratio is 0.3.	CO5	10 Marks

(OR)

10		A thick Cylinder has inner and outer diameters as 120 mm and 180 mm respectively. It is subjected to an external pressure of 9 MPa. Find the value of the internal pressure which can be applied if the maximum stress is not to exceed 30 MPa. Draw the curves showing the variation of the hoop and radial stresses through the material of the cylinder.	CO5	14 Marks

❁ ❁ ❁

CODE No.:16BT30401 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations, November – 2022

ELECTRONIC CIRCUIT ANALYSIS AND DESIGN

[Electronics and Communication Engineering]

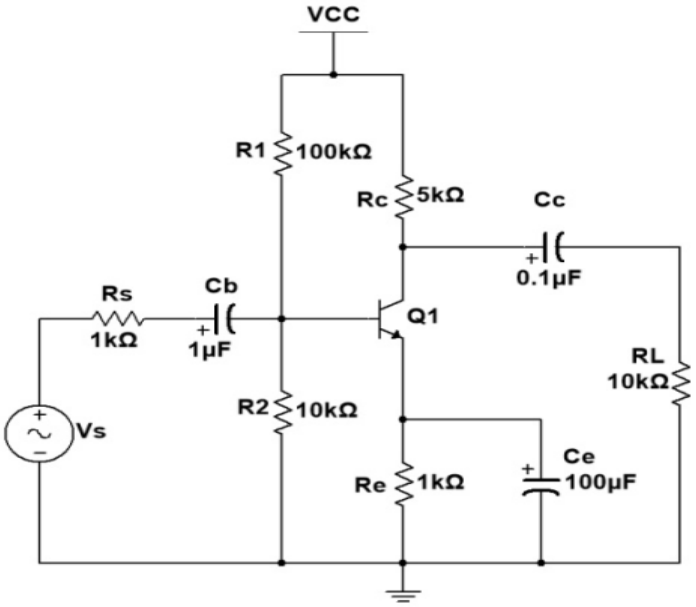
Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 For the transistor shown below, Compute A_i, A_v, A_{vs}, Z_i and Z_o. CO4 14 Marks

Assume h_{ie}=1KΩ, h_{fe}=100, h_{re}=2.5×10^{-4} and h_{oe}=24μʊ.



(OR)

2 Draw the circuit of a RC coupled amplifier Explain its behavior at low, mid and high frequencies by drawing separate equivalent circuit for each frequency region. CO4 14 Marks

UNIT-II

3 a) Explain CE current gain with and without resistive load. CO1 8 Marks

b) Define f_α, f_β and f_T. CO1 6 Marks

(OR)

4 Derive the expressions for voltage gain, current gain, input and output resistances of a Common Source amplifier at high frequencies. CO2 14 Marks

UNIT-III

5 a) With a neat sketch explain a negative feedback amplifier and obtain expression for its closed loop gain. CO1 8 Marks

b) An amplifier requires an input signal of 60mV to produce a certain output. With a negative feedback to get the same output the required signal is 0.5V.The voltage gain with feedback is 90.Find the open loop gain and feedback factor. CO2 6 Marks

(OR)

6	a)	Draw the circuit of Hartley oscillator and explain its working. Derive the expressions for frequency of oscillation and condition for starting of oscillation.	CO2	10 Marks
	b)	In an Hartley oscillator, if L_1=0.2mH,L_2=0.3mH and C=3nF, calculate the frequency of its oscillation.	CO2	4 Marks

UNIT-IV

7	a)	A signal $i_b=I_m$ Cosωt is applied to a power amplifier with second order nonlinearity between i_b and i_c. Derive the expression for i_C and also derive distortion factor.	CO2	8 Marks
	b)	Explain the operation of a class A power amplifier with necessary diagram.	CO3	6 Marks
		(OR)		
8	a)	Draw the circuit diagram of a Class B amplifier, and derive an expression for its conversion efficiency.	CO2	8 Marks
	b)	In an Ideal Class B push pull amplifier, V_{CC}=20V, N_2:N_1=2:1 and R_L=20Ω.Find the output signal power, $P_{0max}$and collector dissipation in each Transistor, P_C under full power condition, Find P_{Cmax} also.	CO3	6 Marks

UNIT-V

9	a)	Define Q-factor, derive the expressions for Q factors of RL and RC circuits.	CO1	8 Marks
	b)	Explain about the stability of Tuned amplifiers.	CO1	6 Marks
		(OR)		
10		Derive the expressions for 3dB bandwidth of i) Capacitance coupled single tuned amplifiers, ii) Double tuned amplifiers.	CO2	14 Marks

❀ ❀ ❀

CODE No.:16BT30402 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations, November – 2022

SIGNALS AND SYSTEMS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Find the convolution sum of two sequences $x[n] = \{1, 4, 3, 2\}$, $[n] = \{1, 3, 2, 1\}$ by graphical representation.	CO1	7 Marks
	b)	Discuss the importance of impulse signal as test signal for testing of various electronic equipments to ensure the safety and security of environment.	CO1	7 Marks

(OR)

2		Compute convolution integral of x(t) and h(t) waveform shown in fig.1.	CO1	14 Marks

fig.1

UNIT-II

3	a)	Find the Exponential Fourier series representation of the following signals i) $x(t) = 3\sin(4\omega_0 t)$ ii) $x(t) = \cos 2t$	CO1	7 Marks
	b)	State and prove the following properties of Fourier Transforms i) Time shifting , ii) Differentiation in frequency domain, iii) Parseval's Theorem.	CO4	7 Marks

(OR)

4		Obtain the Fourier transform of the following functions: i) Impulse train ii) dc signal iii) $\cos \omega_0 t$ iv) Gaussian pulse	CO4	14 Marks

UNIT-III

5	a)	The impulse response of a system is $h(t) = e^{-2t}\,u(t)$ when excited by the input given by $x(t) = e^{-4t}[u(t) - u(t-2)]$. Determine the output of the system using Graphical model.	CO1	7 Marks
	b)	A signal $x(t) = e^{-2t}\,u(t)$ is passed through an ideal low pass filter with cut off frequency of 1 rad/sec. Determine the output energy spectral density and the output energy.	CO1	7 Marks

(OR)

6	a)	Consider a linear system with impulse response $h(t)$, defined and derive the relation between the input and output power spectral densities**.**	CO2	7 Marks
	b)	State and prove any three properties of auto correlation function.	CO1	7 Marks

UNIT-IV

7	a)	Find the signal whose bilateral transform is $X(s) = \frac{1}{(s+5)(s+1)}$ - $5 < \mathrm{Re}(s) < 1$.	CO4	7 Marks
	b)	Find the transfer function of an ideal differentiator.	CO5	7 Marks

(OR)

8		Determine Laplace transform of the following continuous time signals and their ROC. i) $x(t) = A\,u(t)$ ii) $x(t) = t\,u(t)$ iii) $x(t) = e^{-3t}\,u(t)$ iv) $x(t) = e^{-3t}\,u(-t)$ v) $x(t) = e^{-3\lvert t\rvert}$	CO4	14 Marks

UNIT-V

9	a)	Determine the Z – Transform of the following sequences and sketch their ROC's i) $x(n) = n\,u(n)$ ii) $x(n) = (0.4)^n\,[u(n) - u(n-8)]$	CO3	7 Marks
	b)	State and prove the Sampling theorem.	CO1	7 Marks

(OR)

10	a)	i) Determine the Inverse Z-Transform Using Residue Method $X(z) = 3z^{-1}/(1 - z^{-1})(1 - 4z^{-1})$ ROC: $1 < \lvert z \rvert < 4$. ii) Find the inverse Z-Transform of $X(z) = 1 + 3z^{-1}/1 + 3z^{-1} + 2z^{-2}$ for $\lvert z \rvert > 2$.	CO3	7 Marks
	b)	Using appropriate method find y(n) of Z transformed signal $Y(z) = z/(z-1)^3$.	CO3	7 Marks

CODE No.:16BT30403 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations, November – 2022

SWITCHING THEORY AND LOGIC DESIGN

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Determine the binary code for each of the ten decimal digits using a weighted code with weights 7, 4, 2 and 1.	CO1	6 Marks
	b)	The solutions to the quadratic equation $x^2 - 11x + 22 = 0$ are $x = 3$ and $x=6$. What is the base of the numbers?	CO4	4 Marks
	c)	Simplify the following Boolean expressions to a minimum number of literals using basic Boolean laws. i) $X' + XY + XZ' + XY'Z'$. ii) $XY' + Y'Z' + X'Z'$.	CO5	4 Marks

(OR)

2	a)	List and explain the axiomatic definition of Boolean algebra.	CO1	6 Marks
	b)	Simplify the following Boolean expressions to a minimum number of literals: i) $xyz + x'y + xyz'$ ii) $(A + B)'(A' + B')'$ iii) $(a + b + c')(a'b' + c)$ iv) $(BC' + A'D)(AB' + CD')$	CO5	8 Marks

UNIT-II

3	a)	Simplify the following Boolean function using four variable maps i) $F(w, x, y, z) = \sum(2, 3, 12, 13, 14, 15)$. ii) $F(A, B, C, D) = \sum(3, 7, 11, 13, 14, 15)$.	CO5	6 Marks
	b)	Implement the following functions with NOR and NAND gates. Assume that both the normal and complement inputs are available. i) $AB' + C'D' + A'CD' + DC'(AB + A'B') + DB(AC' + A'C)$. ii) $AB'CD' + A'BCD' + AB'C'D + A'BC'D$.	CO3	8 Marks

(OR)

4	a)	Find all the prime implicants for the following Boolean functions, and determine which are essential: i) $F(w,x,y,z) = \sum(0, 2, 4, 5, 6, 7, 8, 10, 13, 15)$. ii) $F(A,B,C,D) = \sum(0, 1, 2, 5, 7, 8, 9, 10, 13, 15)$.	CO4	6 Marks
	b)	Simplify the following Boolean functions by means of the tabulation method $F(A, B, C, D, E, F) = \sum(6, 9, 13, 18, 19, 25, 27, 29, 41, 45, 57, 61)$.	CO5	8 Marks

UNIT-III

5	a)	Define multiplexer and implement full adder using 4X1 multiplexer.	CO6	8 Marks
	b)	Design a combinational circuit that generates the 9's complement of a BCD digit.	CO3	6 Marks

(OR)

6	a)	Design a code converter that converts a decimal digit from BCD to 8 4 -2 -1 code.	CO3	7 Marks
	b)	Design a circuit of a 3 bit parity generator and the circuit of a 4 bit parity checker using an odd parity bit.	CO2	7 Marks

UNIT-IV

7	a)	Explain the edge triggering and how do you achieve the edge triggering in Flip Flops.	CO1	6 Marks
	b)	The circuit is described by the following flip-flop input equations: $J_A = x$ $K_A = B$ $J_B = x$ $K_B = A'$ i) Derive the state equations $A(t+1)$ and $B(t+1)$ by substituting the input equations for the J and K variables. ii) Draw the state diagram of the circuit.	CO2	8 Marks

(OR)

8	a)	Explain the operation of four bit universal shift register with neat block diagram.	CO1	7 Marks
	b)	Design a four-bit binary synchronous counter with D flip - flops.	CO3	7 Marks

UNIT-V

9	a)	Explain the differences between asynchronous and synchronous sequential circuits.	CO1	5 Marks
	b)	Draw a PLA circuit to implement the functions. $F = A'BC + AC + A'BC'$ $G = (AC + ABC + BC)'$	CO2	9 Marks

(OR)

10	a)	Define ROM and explain different types of ROMs.	CO1	4 Marks
	b)	Tabulate the PLA programming table for the four Boolean functions listed below. Minimize the numbers of product terms. $A(x, y, z) = \sum(1, 3, 5, 6)$ $B(x, y, z) = \sum(0, 1, 6, 7)$ $C(x, y, z) = \sum(3, 5)$ $D(x, y, z) = \sum(1, 2, 4, 5, 7)$.	CO6	10 Marks

CODE No.: 16BT30503 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations, November – 2022

PYTHON PROGRAMMING

[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the essence of computational problem solving with suitable example.	CO1	8 Marks
	b)	Write about control characters.	CO1	6 Marks
		(OR)		
2	a)	Define the terms variable, identifier and keyword in Python with suitable example for each.	CO1	9 Marks
	b)	Differentiate between coercion and type conversion.	CO1	5 Marks

UNIT-II

3	a)	Write in detail about selection control statement in Python with examples.	CO2	9 Marks
	b)	Write a Python program to check whether the given number is prime or not.	CO5	5 Marks
		(OR)		
4	a)	Discuss in detail about Boolean operators.	CO1	7 Marks
	b)	Differentiate between lists, tuples and dictionary in python.	CO2	7 Marks

UNIT-III

5	a)	Write a Python program to find the minimum and maximum value from the given numbers using function.	CO5	8 Marks
	b)	Explain why binary files do not contain newline characters.	CO3	6 Marks
		(OR)		
6	a)	Illustrate the use of string processing in Python.	CO2	7 Marks
	b)	Differentiate between a text file and a binary file in Python.	CO3	7 Marks

UNIT-IV

7	a)	Write in detail about fundamental concept of object oriented programming.	CO1	6 Marks
	b)	With suitable examples explain about absolute positioning and relative positioning.	CO3	8 Marks
		(OR)		
8	a)	How do you create and control any number of turtle objects? Explain	CO2	6 Marks
	b)	Develop a simple program for bouncing ball that exactly three balls are created, each with different colors.	CO4	8 Marks

UNIT-V

9	a)	Explain briefly about TKinter pragmatics.	CO1	7 Marks
	b)	Write in detail about binding events with a suitable example.	CO2	7 Marks
		(OR)		
10	a)	What is meant by Event-driven program? Explain with a suitable example.	CO1	7 Marks
	b)	Write about scales widget type.	CO2	7 Marks

❀ ❀ ❀

CODE No.: 16BT31201 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations, November – 2022

DISCRETE MATHEMATICAL STRUCTURES

[Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Show that: $P \vee (P \wedge Q) \Leftrightarrow P$.	CO1	7 Marks
	b)	Obtain the p.d.n.f of the formula given by $(\sim P \wedge R) \vee (Q \wedge R)$.	CO1	7 Marks
		(OR)		
2	a)	Prove (or) Disprove the validity of the following argument. Every living thing is a Plant or animal. Davids dog is alive and it is not a plant. All animals have hearts. Hence, David's dog has a heart.	CO1	7 Marks
	b)	Prove that $(\exists x)(P(x) \wedge Q(x)) \Rightarrow (\exists x)\, P(x) \wedge (\exists x)\, Q(x)$.	CO2	7 Marks

UNIT-II

3	a)	Show that if R,S are equivalence relations on set A the $R \cap S$ is also equivalance relation.	CO1	7 Marks
	b)	Let $X=\{2, 3, 6, 12, 24, 36\}$ and the relation $\leq$ be such that $x \leq y$ if x divides y. Draw the Hasse diagram of $(X, \leq)$.	CO1	7 Marks
		(OR)		
4	a)	Show that the function $f(x) = x^3 - 1$ is bijective function. Find its inverse function.	CO1	7 Marks
	b)	Define Distributive Lattice. Check whether $(D_{20}, \mid)$,where D_{20} is divisors of 20 and $\mid$ represents the relation divides.	CO1	7 Marks

UNIT-III

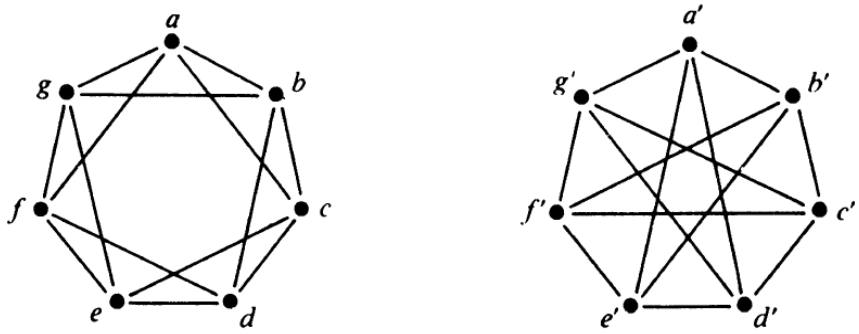
5	a)	Show that the set Q+(=set of all positive rational numbers) form an abelian group with respect to the composition * defined by, a*b=ab/3, $\forall\, a, b \in Q+$.	CO5	7 Marks
	b)	Define semigroup and Monoid. Give an example of semigroup which is not a Monoid.	CO5	7 Marks
		(OR)		
6	a)	Define Algebriac structure? List its properties?	CO5	7 Marks
	b)	State and Prove Lagranges theorem.	CO5	7 Marks

UNIT-IV

7	a)	Prove by mathematical Induction that $6^{n+2} + 7^{2n+1}$ is divisible by 43 for all +ve integers.	CO1	7 Marks
	b)	There are 30 females and 35 males in the junior class while there are 25 females and 20 males in the senior class. In how many ways can a committee of 10 be chosen so that there are exactly 5 females 3 juniors on the committee?	CO5	7 Marks
		(OR)		
8	a)	Solve the Reccurence Relation $a_n - 7a_{n-1} + 16a_{n-2} - 12a_{n-3} = 0$,where $a_0=1$, $a_1=4$,$a_2=8$.	CO1	7 Marks
	b)	Solve the Reccurence Relation $a_n - 6a_{n-1} + 8a_{n-2} = n.4^n$.	CO1	7 Marks

UNIT-V

9 a) What is meant by Isomorphism? Determine whether the following graphs G_1 and G_2 Isomorphic or not? CO5 7 Marks



b) Define the Hamiltonian Path and Hamiltonian Cycle. Determine whether the graph (G_3) is Hamiltonian or not? CO4 7 Marks

(OR)

10 a) Write the algorithm for Depth First Search. Explain with a example. CO4 7 Marks

b) State Krushkal's Algorithm. Illustrate it by using an example. CO3 7 Marks

❀ ❀ ❀

CODE No.: 16BT31501 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Regular Examinations, November - 2022

OPERATING SYSTEMS

[Computer Science & Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What is a System Call? Write about the purpose of a system call.	CO1	7 Marks
	b)	Explain about special purpose systems.	CO1	7 Marks
		(OR)		
2	a)	Differentiate between preemptive and non preemptive scheduling.	CO1	6 Marks
	b)	Write in detail about the thread libraries.	CO1	8 Marks

UNIT-II

3	a)	Show how to prevent critical section problem by using locks.	CO2	7 Marks
	b)	State and explain the readers-writers problem. Suggest a solution to it by using semaphores.	CO2	7 Marks
		(OR)		
4	a)	Explain how to recover the system from a deadlock.	CO2	7 Marks
	b)	With the aid of a suitable example, show how to use Banker's algorithm for deadlock avoidance.	CO2	7 Marks

UNIT-III

5	a)	Discuss in detail about various page table structures.	CO2	7 Marks
	b)	Describe second chance page replacement algorithm.	CO2	7 Marks
		(OR)		
6	a)	Explain the difference between internal and external fragmentation.	CO2	6 Marks
	b)	Describe the concept of virtual memory. Explain its techniques.	CO2	8 Marks

UNIT-IV

7	a)	Explain in detail about free space management.	CO4	7 Marks
	b)	Describe the methods for implementing a directory structure by mentioning the tradeoffs of each.	CO4	7 Marks
		(OR)		
8		Explain in detail about different disk scheduling algorithms.	CO1	14 Marks

UNIT-V

9		Explain the following. i) Application I/O Interface; ii) Kernel I/O subsystem.	CO5	14 Marks
		(OR)		
10		Write short notes on i) Domain of protection; ii) Revocation of access rights.	CO5	14 Marks

❀ ❀ ❀

CODE No.: 16BT50502 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-16) Supplementary Examinations, November – 2022

LINUX PROGRAMMING
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Demonstrate time function using appropriate environment variables.	CO5	10 Marks
	b)	List out the members of tm structure.	CO1	4 Marks
		(OR)		
2	a)	Display the current date and time using tm-structure.	CO1	7 Marks
	b)	Describe the following environment variables. i) strptime. ii) strftime.	CO3	7 Marks

UNIT-II

3	a)	Write a shell script to find factorial of a given number.	CO3	10 Marks
	b)	Discuss the usage of AND List and OR List with example.	CO1	4 Marks
		(OR)		
4	a)	Design a C Program to display Environment variables.	CO4	6 Marks
	b)	Discuss the following commands. i) set. ii) unset. iii) shift. iv) trap.	CO1	8 Marks

UNIT-III

5	a)	Explain the following system calls for managing files. i) lseek. ii) fstat,stat and lstat. iii) dup and dup2	CO1	10 Marks
	b)	Design a shell script to list all of the directory files in a directory.	CO4	4 Marks
		(OR)		
6	a)	Differentiate the following : i) getc() ***vs*** fgetc() ii) stat() ***vs*** fstat() iii) printf() ***vs*** fprintf() iv) scanf() ***vs*** fscanf()	CO2	10 Marks
	b)	Differentiate system calls and Library Functions and give the syntax for the open system call and fopen library function in detail.	CO2	4 Marks

UNIT-IV

7	a)	Define process. Describe the structure of process.	CO1	7 Marks
	b)	Discuss the need for process table.	CO1	7 Marks
		(OR)		
8	a)	Explain briefly about system processes and process scheduling.	CO1	7 Marks
	b)	Illustrate the method of process creation with example.	CO5	7 Marks

UNIT-V

9	a)	Discuss the process of file descriptor manipulation by close and dup system calls.	CO1	7 Marks
	b)	Write a program to create a process using fork() and display Child and Parent Process Id's.	CO3	7 Marks
		(OR)		
10	a)	Describe the process of creating named pipes and FIFO.	CO1	7 Marks
	b)	Discuss the method of accessing FIFO, opening FIFO files, reading and writing FIFOs.	CO1	7 Marks

❀ ❀ ❀

CODE No.: 19BT3BS01 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations, November 2022

NUMERICAL METHODS, PROBABILITY AND STATISTICS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Find an approximate root for the equation $xe^x = 2$ by using method of false position. — 6 Marks L1 CO1 PO1

   b) Apply Newton-Raphson method, find the real root of the equation $3x = \cos x + 1$. — 6 Marks L3 CO1 PO2

(OR)

2. a) Using Newton's Forward interpolation formula compute the value of sin 52° given sin45° = 0.7071, sin 50° = 0.7660, sin55° = 0.8192 and sin 60° = 0.8660. — 6 Marks L3 CO1 PO1

   b) Apply Lagrange's interpolation formula, compute the value of $f(9)$ from the following data: — 6 Marks L3 CO1 PO1

x	5	7	11	13	17
$f(x)$	150	392	1492	2366	5202

UNIT-II

3. a) The population of a certain town (as obtained from census data) is shown in the following table. — 6 Marks L3 CO1 PO2

Year	1951	1961	1971	1981	1991
Population (in thousands)	19.96	39.65	58.81	77.21	94.61

   calculate the rate of growth of the population in the year 1981.

   b) Using Simpson's $\frac{1}{3}$ rule to find $\int_0^6 \frac{dx}{1+x^2}$ by taking seven ordinates. — 6 Marks L3 CO1 PO1

(OR)

4. a) Find the values of $y(0.1)$ and $y(0.2)$ given that $y' = 2y + 3e^x$, $y(0) = 0$ by using Taylor's series method. — 6 Marks L1 CO1 PO2

   b) Apply Runge–Kutta fourth order method to find an approximate value of y when x = 0.2 given that $\frac{dy}{dx} = x + y$, y(0) = 1. — 6 Marks L3 CO1 PO1

UNIT-III

5. a) A sample of 4 items is selected at random from a box containing 12 items of which 5 are defective. Let X denote the number of defective items in the sample. Find the probability distribution of X and also obtain the mean of X. — 6 Marks L1 CO2 PO2

   b) For the continuous random variable X whose Probability density function is given by $f(x) = \begin{cases} cx(2-x), & if\ 0 \le x \le 2 \\ 0, & otherwise \end{cases}$ where $\boldsymbol{c}$ is a constant. Find the value of $\boldsymbol{c}$ and also obtain the mean and variance of X. — 6 Marks L1 CO2 PO1

(OR)

6.	a)	For the following probability distribution $X = x$ | -3 | 6 | 9 $P(X = x)$ | 1/6 | 1/2 | 1/3 Find i) $E(X)$ ii) $E(X^2)$ iii) $E[(2X+1)^2]$	6 Marks	L1	CO2	PO1
	b)	For the continuous probability function $f(x) = kx^2e^{-x}$ *when* $x \geq 0$. Calculate the value of k and also obtain the mean and variance of X.	6 Marks	L3	CO2	PO1

UNIT-IV

7.	a)	Assume that 50% of all engineering students are good in Mathematics, find the probabilities that among 18 engineering students - i) exactly 10, ii) at least 10 iii) at least 2 and at most 9 are good in mathematics.	6 Marks	L1	CO2	PO2
	b)	In a test on 2000 electric bulbs, it was found that the life of a particular make was normally distributed with an average life of 2040 hrs and standard deviation of 60 hours. Find the number of bulbs likely to burn for ; i) more than 2150*hrs* ii) less than 1950 *hrs* and iii) more than 1920 *hrs* and but less than 2160 *hrs*.	6 Marks	L1	CO2	PO2

(OR)

8.	a)	If a random variable X has a Poisson distribution such that $P(1) = P(2)$, Calculate: i) Mean ii) $P(1 < X < 4)$.	6 Marks	L3	CO2	PO1
	b)	For a Normally distributed variate with mean 1 and standard deviation 3, find the probabilities that i) $3.43 \leq x \leq 6.19$ ii) $-1/43 \leq x \leq 6.19$	6 Marks	L1	CO2	PO1

UNIT-V

9.	a)	In a sample of 500 from a village in Andhra Pradesh, 280 are found to be rice eaters and the rest are wheat eaters. Examine that both the articles are equally popular or not.	6 Marks	L4	CO2	PO4
	b)	The means of two large samples of sizes 1000 and 2000 members are 67.5 *cm* and 68.0 *cm* respectively. Test whether the sample has come from the same population standard deviation 2.5 *cm*.	6 Marks	L4	CO2	PO4

(OR)

10.	a)	The measurements of the output of two units have given the following results. Assuming that both samples have been obtained from the normal population at 10% significance level, test whether the two populations have the same variance. Unit-A | 14.1 | 10.1 | 14.7 | 13.7 | 14.0 Unit-B | 14.0 | 14.5 | 13.7 | 12.7 | 14.1	6 Marks	L4	CO2	PO4
	b)	In an investigation on the machine performance, the following results were obtained: Machine 1 | No. of units inspecteds: 375 | No. of defectives: 17 Machine 2 | 450 | 22 Test whether there is any significant performance of two machines at $\alpha = 0.05$.	6 Marks	L4	CO2	PO4

CODE No.: 19BT30102 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations, November – 2022

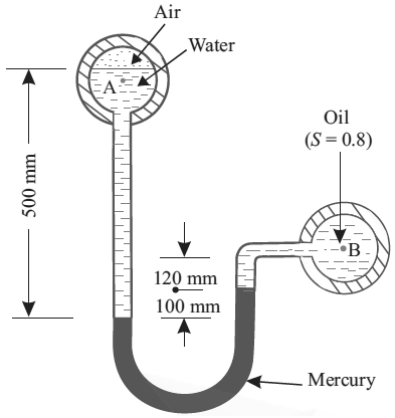
FLUID MECHANICS
[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Differentiate between cohesion and adhesion? Explain the various types of fluids vary with temperature.	6 Marks	4	CO1	PO1 PO2
	b)	Figure shows a differential manometer connected at two points A and B. If at A air pressure is 78.5 kN/m^2, find the absolute pressure at B.	6 Marks	4	CO1	PO1 PO2 PO10



(OR)

2.	a)	What is the principle associated with buoyancy? Explain buoyancy, center of buoyancy, metacenter and metacentric height.	6 Marks	2	CO2	PO1 PO10
	b)	A circular door of 0.5 m diameter closes on an opening in the vertical side of a bulk head, which retains water. The center of the opening is at a depth of 2m from the water level. Determine the total pressure on the door. Take specific gravity of sea water as 1.03.	6 Marks	4	CO2	PO1 PO2

UNIT-II

3.	a)	i) Define and explain briefly the following: Velocity potential and Stream function. ii) For the following stream functions calculate velocity at a point (1, 2):$\psi = 3xy$ and $y = 3x^2y - y^3$	6 Marks	4	CO2	PO1 PO2
	b)	What is the irrotational velocity field associated with the potential $\varphi = 3x^2 - 3x + 3y^2 + 16t^2 + 12zt$. Does the flow field satisfy the incompressible continuity equation?	6 Marks	4	CO2	PO1 PO2 PO4

(OR)

4.	a)	Explain about impulse-momentum equation? Also write its applications.	6 Marks	2	CO2	PO1 PO5
	b)	A 45° reducing bend is connected in pipeline, the diameters at the inlet and outlet of the bend being 400 mm and 200 mm respectively. Find the force exerted by water on the bend if the intensity of pressure at inlet of the bend is 215 kN/m^2. The rate of	6 Marks	4	CO2	PO1 PO2 PO4 PO10

flow of water is 0.5 m^3/s.

UNIT-III

5.	a)	A convergent-divergent mouthpiece having throat diameter 40 mm is discharging water under a constant head of 4 meters. Determine the maximum outlet diameter to avoid separation of the flow, if the maximum vacuum pressure is 8·5 meters of water. Find the discharge also.	6 Marks	4	CO3	PO1 PO2 PO4
	b)	The following data relate to venturimeter fitted to an inclined pipe in which water is flowing. Diameter of the pipe = 300 mm, Throat diameter = 150 mm, Sp. gravity of liquid used in U-tube manometer= 0.8, Reading of manometer = 400 mm, Loss of head between the inlet and throat = 0.3 × kinetic head of the pipe. Find the discharge using the given data.	6 Marks	4	CO3	PO1 PO2 PO4 PO5 PO10
		(OR)				
6.	a)	A rectangular notch 0·5 m long is used for measuring a discharge of 0·04 m^3/s. An error of 2 mm was made in measuring the head over the notch. Calculate the percentage error in the discharge. Take C_d = 0·6.	6 Marks	4	CO3	PO1 PO2 PO10
	b)	For sudden expansion in a pipe flow, work out the optimum ratio between the diameter of the pipe before expansion and the diameter of pipe after expansion so that pressure rise is maximum? Also find the maximum pressure rise.	6 Marks	6	CO4	PO1 PO2 PO3 PO5 PO10

UNIT-IV

7.	a)	Differentiate laminar and turbulent flow.	6 Marks	2	CO5	PO1 PO2 PO10
	b)	An oil of viscosity 0.9 poise and specific gravity 0.8 is flowing through a horizontal pipe of 80 mm and length 15 m. Calculate the difference of pressure at the two ends, if 50 kg of the oil is enclosed in a tank in 15 seconds.	6 Marks	4	CO5	PO1 PO2 PO4 PO10
		(OR)				
8.	a)	Obtain an expression for the coefficient of friction in terms of shear stress.	6 Marks	4	CO5	PO1 PO2
	b)	Determine the average height of the roughness for a rough pipe of diamter 10 cm when the velocity at a point 4 cm from wall is 40% more than the velocity at a point 1 cm from a pipe wall.	6 Marks	4	CO5	PO1 PO2 PO4

UNIT-V

9.	a)	Explain the step by step procedure to develop the relationship between variables using Rayleigh method.	6 Marks	2	CO6	PO1 PO5
	b)	Discharge Q through a turbine is a function of the turbine speed n, head H, diameter D of the runner, density ρ, and viscosity μ of the fluid and acceleration due to gravity g. Find the expression for Q using Buckingham method.	6 Marks	4	CO6	PO1 PO2 PO5
		(OR)				
10.		A 7.2 m height NS 15 m long spillway discharges 94 cumecs discharge under a head of 2 m. If a 1:9 scale model of this spillway is to be constructed, determine model dimensions, head over spillway model and model discharge. If model experiences a force of 7500 N determine force on the prototype.	12 Marks	4	CO6	PO1 PO2 PO4 PO5

CODE No.: 19BT30103 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations, November – 2022

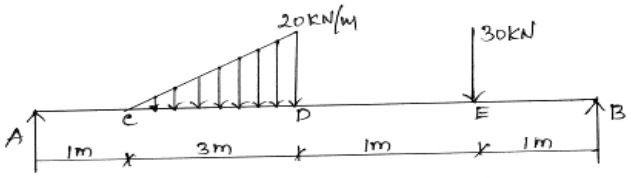
MECHANICS OF SOLIDS

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Derive the maximum shear force and bending moment for a cantilever beam subjected to point load at the free end.	6 Marks	L4	CO1	PO1 PO2 PO4 PO10
	b)	A cantilever beam of span 4 m is subjected to a uniformly distributed load of 3 kN/m for the entire span. Determine the shear force and bending moment at the salient point. Draw SFD and BMD	6 Marks	L4	CO1	PO1 PO2 PO4 PO10
		(OR)				
2.		Determine the maximum shear force and bending moment of a Simply Supported beam shown in the Fig.1 and draw SFD and BMD. 	12 Marks	L4	CO1	PO1 PO2 PO4 PO10

UNIT-II

3.	a)	A beam consists of a symmetrical rolled steel joist. The beam is simply supported at its ends and carries a point load at the centre of the spa. If the maximum stress due to bending is140 MPa, find the ratio of the depth of the beam section to span in order that the central deflection may not exceed 1/480 of the span. Take E = 200 GPa.	6 Marks	L6	CO2	PO1 PO2 PO3 PO4 PO6 PO10
	b)	A beam of channel section 120 mm x 60 mm has uniform thickness of 15 mm. Draw the diagram showing the distribution of shear stress for the vertical section where the shearing force is 50 kN. Also find the ratio between maximum and mean shear stress.	6 Marks	L4	CO2	PO1 PO2 PO4 PO10
		(OR)				
4.		A masonry chimney having a shape of the frustum of a cone is 25 m high. The external diameter at the top and the internal diameter at the bottom is 2 m. The chimney is 0.5 m thick at the base. If the weight of the chimney is 1800 kN, find the uniform horizontal wind pressure that may act per unit projected area of the chimney in order tension at the base may be just avoided.	12 Marks	L4	CO3	PO1 PO2 PO6 PO10

UNIT-III

5.	a)	A steel shaft transmits 100 kW at 160 rpm. The shaft is 100 mm in diameter, find the torque of the shaft and the maximum shearing stress induced. Find also the twist of the shaft in a length of 6 m. Take $C=8x10^4$ N/mm^2.	6 Marks	L4	CO4	PO1 PO2 PO4 PO6

	b)	A solid circular shaft transmits 75 kW at 200 rpm. Calculate the shaft diameter if the twist in the shaft is not to exceed 1° in 2 m of shaft and the shearing stress in limited to 50 N/mm^2. Take $C=1x10^5$ N/mm^2.	6 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO6
		(OR)				
6.	a)	Mention some of the functions of the springs. Derive the shear stress and deflection of a close coiled helical spring with axial load for a circular section.	6 Marks	L4	CO4	PO1 PO2
	b)	A close coiled helical spring is to have a stiffness of 900 N/m in compression, with a maximum load of 45 N and a maximum shear stress of 120 N/mm^2. The solid length of the spring is 45 mm. Find the wire diameter and mean coil radius. Take $C=0.4x10^5$ N/mm^2.	6 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO6
		UNIT-IV				
7.	a)	Derive the expression for the stresses acting in an inclined plane due to two perpendicular stresses.	6 Marks	L4	CO5	PO1 PO2 PO10
	b)	A tie bar is 10 m long and 60 mm by 40 mm in section. It is subjected to an axial pull of 400 kN and increase in length is found to be 7 mm. Determine the intensity of stress on a right cross section, normal and tangential and shear stresses on a plane inclined at 60° to the longitudinal axis, and also the modulus of elasticity of the material.	6 Marks	L4	CO5	PO1 PO2 PO6 PO10
		(OR)				
8.		In a steel member at a point the major principal stress is 180 MN/m^2 and the minor principal stress is compressive. If the tensile yield point of the steel is 225 MN/m^2, find the value of the minor principal stress at which yielding will commence, according to each of the following criteria of failure i) Maximum Shearing Stress. ii) Maximum Total Strain Energy. iii) Maximum Shear Strain Energy. Take Poisson's ratio=0.26	12 Marks	L6	CO2	PO1 PO2 PO6 PO10
		UNIT-V				
9.	a)	Define slenderness ratio. Derive the Euler's formula when both ends of the column are fixed.	8 Marks	L4	CO6	PO1 PO2
	b)	Calculate the critical load of a strut which is made of a bar circular in section and 5 m long and which is pin-jointed at both ends. The same bar when freely supported gives mid-span deflection of 10 mm with a load of 80 N at the centre.	4 Marks	L4	CO6	PO1 PO2 PO5 PO6
		(OR)				
10.		Compare the crippling loads given by Rankine's and Euler's formulae for tubular strut 2.25 m long having outer and inner diameters of 37.5 mm and 32.5 mm loaded through pin-joint at both ends. Take yield stress as 315 MN/m^2; a = 1/7500; and E = 200 GN/m^2. If elastic limit for the materia.l is taken as 200 MN/m^2, then for what length of the strut does the Euler formula cease to apply?	12 Marks	L4	CO6	PO1 PO2 PO5 PO6

CODE No.: 19BT30202 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations, November – 2022

ELECTROMAGNETIC FIELDS
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	State and compare Coulomb's Law and Gauss's Law.	6 Marks	L2	CO1	PO1
	b)	A charge lies in y=-5m plane in the form of an infinite square sheet with a uniform charge density of $20nC/m^2$. Determine the electric field intensity at all the points.	6 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Derive an expression for electric flux density due to a differential volume element.	6 Marks	L3	CO1	PO1
	b)	Q1 and Q2 are the point charges located at (0,-4,3) and (0,1,1). If Q1 is 2 nC, find Q2 such that the force on a test charge at (0,-3, 4) has no Z-components.	6 Marks	L3	CO1	PO2

UNIT-II

3.	a)	State and explain Ohms law in point form.	6 Marks	L2	CO1	PO1
	b)	Find the total current in outward direction from a cube of 1m, with one corner at the origin, and the edges parallel to the coordinate axes, if $\bar{J} = 2x^2\bar{a}_x + 2xy^3\bar{a}_y + 2xy\bar{a}_z \ A/m^2$.	6 Marks	L3	CO1	PO2
		(OR)				
4.	a)	Derive an expression for current continuity equation.	6 Marks	L3	CO1	PO1
	b)	In a dielectric material, E_x = 5 V/m and $P = \frac{1}{10\pi}\left(3\bar{a}_x - \bar{a}_y + 4\bar{a}_z\right)nC/m^2$. Calculate: i) susceptibility of the material. ii) electric field intensity. iii) electric flux density.	6 Marks	L3	CO1	PO2

UNIT-III

5.	a)	Using Ampere's circuital Law, obtain an expression for magnetic field intensity due to a toroid.	6Marks	L3	CO2	PO5
	b)	A steady current of 1000 A is established in a long straight, hollow aluminium conductor of inner radius 1 cm and outer radius 2 cm. Assuming uniform resistivity, calculate magnetic flux density as a function of radius 'r' from the axis of the conductor.	6 Marks	L3	CO2	PO2
		(OR)				
6.	a)	State and explain Biot-Savart's Law.	6Marks	L2	CO2	PO1
	b)	Derive an expression for magnetic flux density due to a finite current carrying element using Biot-Savart's Law.	6Marks	L3	CO2	PO1

UNIT-IV

7.	a)	Obtain an expression for force between two differential current elements carrying currents I_1 and I_2.	6 Marks	L3	CO2	PO1
	b)	A rectangular coil carrying a current of 5A is placed in the magnetic field $\vec{B} = 0.3(\vec{a}_x + \vec{a}_y)T$. The coil is lying in the y-z plane and has dimensions 0.8m x 0.4m. Find the torque on the coil.	6 Marks	L3	CO2	PO2
		(OR)				
8.	a)	Plot the variation of magnetic field due to two conductors each of radius *R* meters and spaced d meters. One of the conductor carries a current of +I amperes and the other -I amperes.	6 Marks	L2	CO2	PO1
	b)	What is the maximum torque on a square loop of 1000 turns in a field of uniform flux density in 10 Tesla? The loop has 10cm sides and carries a current of 3A.	6 Marks	L3	CO2	PO2

UNIT-V

9.		Write Maxwell's equations for static fields. Explain how they are modified for time varying electric and magnetic fields.	12 Marks	L3	CO3	PO1
		(OR)				
10.	a)	Differentiate between statically induced EMF and dynamically induced EMF and discuss their applications in electrical machines.	6 Marks	L2	CO3	PO1
	b)	A capacitor has a capacitance of 1.5pF. Find the displacement current at t=0, if a voltage 5sin100 (π*t) is applied to it.	6 Marks	L3	CO3	PO2

CODE No.: 19BT30301 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations, November – 2022

ENGINEERING THERMODYNAMICS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Classify systems and Explain with neat sketch quasi static process.	6 Marks	L2	CO1	PO1
	b)	A mass of 1.5 kg of air is compressed in a quasi-static process from 0.1 MPa to 0.7 MPa for which *pv* = constant. The initial density of air is 1.16 kg/m3. Find the work done by the piston to compress the air.	6 Marks	L3	CO1	PO1 PO2
		(OR)				
2.		Derive the steady flow energy equation with all the assumptions made and give the equations when it is applied to 1.Boiler 2.Nozzle 3.Turbine and 4.Compressor.	12 Marks	L2	CO1	PO1 PO2 PO3

UNIT-II

3.		Two Carnot engines A and B are connected in series between two thermal reservoirs maintained at 1000 K and 100 K respectively. Engine A receives 1680 kJ of heat from the high-temperature reservoir and rejects heat to the Carnot engine B. Engine B takes in heat rejected by engine A and rejects heat to the low-temperature reservoir. If engines A and B have equal thermal efficiencies, determine: i) The heat rejected by engine B. ii) The temperature at which heat is rejected by engine, A. iii) The work done during the process by engines, A and B respectively. If engines A and B deliver equal work, determine iv) The amount of heat taken in by engine B. v) The efficiencies of engines A and B.	12 Marks	L1	CO1	PO1 PO2
		(OR)				
4.	a)	Explain the concepts of availability and irreversibility.	6 Marks	L2	CO1	PO1
	b)	In a turbine the air expands from 7 bar, 600^{0}C to 1 bar, 250^{0}C. During expansion 9 kJ/kg of heat is lost to surroundings which is at 1 bar, 15^{0}C. neglecting kinetic and potential energy changes , determine per kg of air: i) The decrease in availability; ii) The maximum work; iii) The irreversibility. For air, take Cp = 1.005 kJ/kgK, h= CpT where Cp is constant.	6 Marks	L3	CO1	PO1 PO2

UNIT-III

5.	a)	Define dryness fraction (or) what is the quality of steam?	4 Marks	L2	CO2	PO1
	b)	A sample of steam from a boiler drum at 3 MPa is put through a throttling calorimeter in which the pressure and temperature are found to be 0.1 MPa, 120°C. Find the quality of the sample taken from the boiler.	8 Marks	L3	CO2	PO1 PO2

(OR)

6.		Derive the other three Maxwell relations Using the cycle relation and first Maxwell relation.	12 Marks	L3	CO1	PO1 PO2

UNIT-IV

7.		Draw a neat schematic of a compressibility chart and indicate its salient features.	12 Marks	L1	CO3	PO1 PO2

(OR)

8.	a)	Explain the Dalton's law of partial pressures for mixture of gases.	6 Marks	L2	CO3	PO1
	b)	Following is the gravimetric analysis of air: Oxygen-23.14%, Nitogen-75.53%, Argon-1.28%, Carbon dioxide-0.05% Calculate analysis by volume and the partial pressure of each constituent when total pressure is 1bar.	6 Marks	L3	CO3	PO1 PO2

UNIT-V

9.		With the help of P-V and T-S diagrams. Show that for the maximum pressure and Temperature of the cycle and the same heat rejection rate $\eta_{diesel} > \eta_{dual} > \eta_{Otto}$	12 Marks	L3	CO4	PO1 PO2

(OR)

10.	a)	Discuss the effect of compression ratio and specific heat ratio on the efficiency of Otto cycle.	6 Marks	L3	CO4	PO1
	b)	An engine of 250 mm bore and 375 mm stroke works on Otto cycle. The clearance volume is 0.00263 m^3. The initial pressure and temperature are 1 bar and 50°C. If the maximum pressure is limited to 25 bar, find the following : i) The air standard efficiency of the cycle. ii) The mean effective pressure for the cycle. Assume the ideal conditions.	6 Marks	L3	CO4	PO1 PO2

CODE No.: 19BT30302 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations, November – 2022

KINEMATICS OF MACHINERY
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

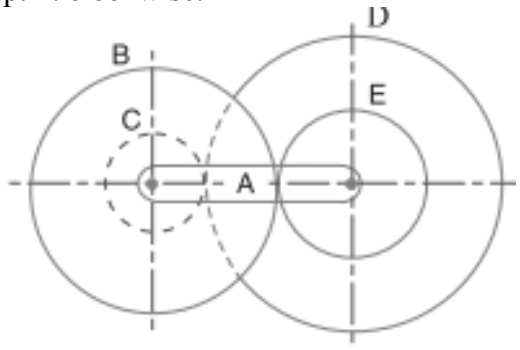
1.	Explain any two inversion single slider crank chain mechanism	12 Marks	L2	CO1	PO1
	(OR)				
2.	Explain Grubler's criterion for determining degree of freedom for mechanisms. Using Grubler's criterion for plane mechanism, prove that the minimum number of binary links in a constrained mechanism with simple hinges is four.	12 Marks	L2	CO1	PO1

UNIT-II

3.	What are straight line mechanisms? Describe one type of exact straight line motion mechanism with the help of a sketch.	12 Marks	L3	CO2	PO1 PO2
	(OR)				
4.	Derive an expression for the ratio of shafts velocities for Hooke's joint and draw the polar diagram depicting the salient features of driven shaft speed.	12 Marks	L3	CO3	PO1 PO2

UNIT-III

5.	Derive an expression for the minimum number of teeth required on the pinion in order to avoid interference in in volute gear teeth when it meshes with wheel.	12 Marks	L4	CO4	PO1 PO2 PO3
	(OR)				
6.	In a reverted epicyclic gear train, the arm A carries two gears B and C and a compound gear D - E. The gear B meshes with gear E and the gear C meshes with gear D. The number of teeth on gears B, C and D are 75, 30 and 90 respectively. Find the speed and direction of gear C when gear B is fixed and the arm A makes 100 r.p.m. clockwise.	12 Marks	L4	CO4	PO1 PO2 PO3



UNIT-IV

7.	A cam is to be designed for knife edge follower with the following data: i) Cam lift =40 mm during 90^0 of cam rotation with SHM ii) Dwell for next 30^0 iii) During the next 60^0 of cam rotation, the follower returns to its	12 Marks	L3	CO5	PO1 PO2 PO3

	original position with uniform acceleration iv) Dwell during the remaining 180^0. Draw the profile of the cam when the line of stroke is offset by 20 mm from the axis of the cam shaft. The radius of the base circle of the cam is 40 mm. Determine the maximum velocity and acceleration of the follower during its ascent and descent, if the cam rotates at 240 rpm.				
	(OR)				
8.	It is required to set out the profile of a cam to give the following motion to the reciprocating follower with a flat mushroom contact face : i) Follower to have a stroke of 20 mm during 120° of cam rotation ; ii) Follower to dwell for 30° of cam rotation ; iii) Follower to return to its initial position during 120° of cam rotation ; and iv) Follower to dwell for remaining 90° of cam rotation. The minimum radius of the cam is 25 mm. The out stroke of the follower is performed with simple harmonic motion and the return stroke with equal uniform acceleration and retardation.	12 Marks	L3	CO5	PO1 PO2 PO3
	UNIT-V				
9.	In a pin jointed four bar mechanism, as shown in Fig. 6.9, AB = 300 mm, BC = CD = 360mm, and AD = 600 mm. The angle BAD = 60°. The crank AB rotates uniformly at 100 r.p.m. Locate all the instantaneous centres and find the angular velocity of the link BC.	12 Marks	L4	CO6	PO1 PO2 PO3
	(OR)				
10.	The crank of a slider crank mechanism rotates clockwise at a constant speed of 300 r.p.m. The crank is 150 mm and the connecting rod is 600 mm long. Determine : i) linear velocity and acceleration of the midpoint of the connecting rod, and ii) angular velocity and angular acceleration of the connecting rod, at a crank angle of 45° from inner dead centre position.	12 Marks	L4	CO6	PO1 PO2 PO3

CODE No.: 19BT30303 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations, November – 2022

MANUFACTURING TECHNOLOGY
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Define pattern and list the various types of patterns with a neat diagram.	6 Marks	L2	CO1	PO1
	b)	Outline the design considerations followed during the design of gating system.	6 Marks	L2	CO1	PO1 PO2 PO3
		(OR)				
2.	a)	Recite the properties of molding sand.	6 Marks	L2	CO1	PO1
	b)	Illustrate the working principle of blast furnace with a neat sketch.	6 Marks	L2	CO1	PO1 PO7
		UNIT-II				
3.	a)	Write short note on full mold casting process.	6 Marks	L2	CO2	PO1 PO7
	b)	List the various casting defects with neat sketch.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Describe centrifugal casting process in detail.	6 Marks	L2	CO2	PO1 PO7
	b)	Write short notes on cleaning and finishing of castings.	6 Marks	L2	CO2	PO1
		UNIT-III				
5.	a)	Discuss the principle of drawing process. List various types of drawing process with beat diagram.	6 Marks	L2	CO3	PO1 PO2
	b)	Elaborate forging operation with a neat sketch.	6 Marks	L2	CO3	PO1 PO7
		(OR)				
6.	a)	Briefly explain progressive die used in sheet metal operations.	6 Marks	L2	CO3	PO1 PO7
	b)	Summarize the magnetic pulse forming process with a neat sketch.	6 Marks	L2	CO3	PO1 PO7
		UNIT-IV				
7.	a)	Explain the working of submerged arc welding with its advantages and limitations.	6 Marks	L2	CO4	PO1 PO7
	b)	List the destructive tests used in welding with neat diagram.	6 Marks	L2	CO4	PO1
		(OR)				
8.	a)	List various welding defects and explain any two welding defects with neat sketches.	6 Marks	L2	CO4	PO1
	b)	Describe thermit welding process with neat sketch.	6 Marks	L2	CO4	PO1 PO7

UNIT-V

9.	a)	Describe the working principle of injection molding process.	6 Marks	L2	CO5	PO1 PO3 PO7
	b)	Discuss the various additives used in plastics with examples.	6 Marks	L2	CO5	PO1 PO2 PO7
		(OR)				
10.	a)	Explain the working principle of compression molding process.	6 Marks	L2	CO5	PO1 PO3
	b)	Recall the properties of plastics.	6 Marks	L2	CO5	PO1

CODE No.: 19BT30304 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations, November – 2022

STRENGTH OF MATERIALS
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		A composite bar is made up of a brass rod of 25 mm diameter enclosed in a steel tube of 40 mm external diameter and 30 mm internal diameter as shown in Fig.1. The rod and tube, being coaxial and equal in length, are securely fixed at each end. If the stresses in brass and steel are not to exceed 70 MPa and 120 MPa respectively, find the load (P) the composite bar can safely carry.	12 Marks	L3	CO1	PO1 PO2

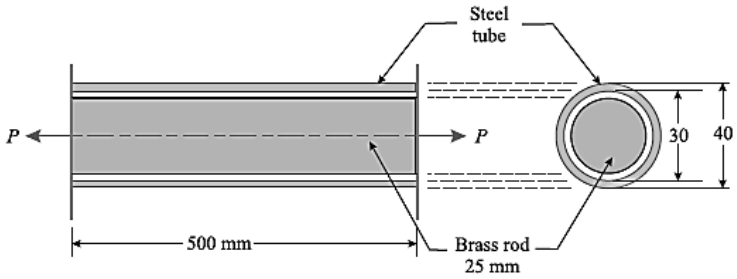


Fig. 1

(OR)

2.		Derive the relation between Modulus of Elasticity (E), Modulus of Rigidity (G) and Bulk modulus (K).	12 Marks	L3	CO1	PO1 PO2

UNIT-II

3.		Draw the shear force and bending moment diagram for the overhanging beam carrying uniformly distributed load of 2kN/m over the entire length and a point load of 2kN as shown in Fig.2. Locate the point of Contra flexure, if any.	12 Marks	L4	CO2	PO1 PO2 PO3

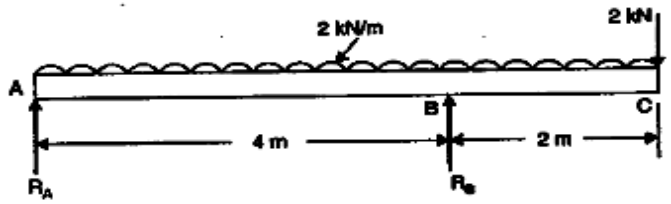


Fig.2

(OR)

4.	a)	What are sagging and hogging bending moments? Explain.	4 Marks	L2	CO2	PO1
	b)	A beam AB 10 m long is simply supported at its ends A and B. It carries a uniformly distributed load of 20 kN/m for a distance of 5 m from the left end A and a concentrated load of 40 kN at a distance of 2 m from the right end B. Draw S.F. and B.M. diagram for the beam. Also find the position and magnitude of maximum bending moment.	8 Marks	L4	CO2	PO1 PO2 PO3

UNIT-III

5.		State the assumptions in the theory of simple bending. Also derive the bending equation from first principles.	12 Marks	L3	CO2	PO1 PO2
		(OR)				
6.		An 'I' section beam consists of two flanges 150 x 20 mm and a web of 310 x 10 mm. Find the magnitude of maximum shear stress when it is subjected to a shear force of 40 kN and draw the shear stress distribution diagram over the depth of the section.	12 Marks	L3	CO2	PO1 PO2 PO3

UNIT-IV

7.	a)	State the assumptions involved in deriving the torsion equation.	4 Marks	L1	CO3	PO1
	b)	A hollow steel shaft of 300 mm external diameter and 200 mm internal diameter has to be replaced by a solid alloy shaft. Assuming the same values of polar modulus for both, calculate the diameter of the latter and work out the ratio of their torsional rigidities. Take C for steel as 2.4 C for alloy.	8 Marks	L3	CO3	PO1 PO2 PO3
		(OR)				
8.	a)	Derive an expression for the stresses on an oblique section of a rectangular body, when it is subjected to a direct stress in only one plane.	4 Marks	L3	CO3	PO1 PO2
	b)	An element in a strained body is subjected to a compressive stress of 200 MPa and a clockwise shear stress of 50 MPa on the same plane. Calculate the values of normal and shear stresses on a plane inclined at 35° with the compressive stress. Also calculate the value of maximum shear stress in the element.	8 Marks	L3	CO3	PO1 PO2 PO3

UNIT-V

9.		A beam AB of 5 m span is simply supported at ends A and B. C is a point on the beam at a distance of 4m from A. The beam has a moment of inertia of 80 x 106 mm4 for the length AC and 20 x 106 mm4 for the length CB. The beam is loaded with a point load of 6 kN at C. Determine the slope at A, deflection at the mid span and maximum deflection. E = 205 GPa.	12 Marks	L4	CO4	PO1 PO2 PO3 PO4
		(OR)				
10.		Derive the relation between slope, deflection and radius of curvature of a deflected beam.	12 Marks	L3	CO4	PO1 PO2 PO3

CODE No.: 19BT30404 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations, November – 2022

SWITCHING THEORY AND LOGIC DESIGN

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Convert: i) octal (26153.7406) to binary. ii) Hexadecimal (2AC5.D) to binary and then to octal. iii) Decimal (1032.2) to binary.	6 Marks	L2	CO1	PO1
	b)	i) Convert gray code 101011 into its binary equivalent. ii) Use 2's complement to perform M - N with the given number M=1010100 N=1000100.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Implement the following logical expression using AND-OR-INVERTER gates and also using only NOR gates. F= A + BC'(D' + BE')	7 Marks	L2	CO1	PO2
	b)	Prove the following using Boolean algebra: i) y'z' + w'x'z' + w'xyz' + wyz' = z' ii) ABC + A'B'C + A'BC +ABC' + A'B'C' = A'B' + B(A+C).	5 Marks	L2	CO1	PO2

UNIT-II

3.	a)	Simplify the following expressions using K-Map i) F = A'B'C'D + AB'C'D + A'B'CD + ABCD' + AB'CD' +A'B'C'D. ii) F (A,B,C,D) = Σm (5,6,7,12,13) + Σd (4,9,14,15).	8 Marks	L4	CO1	PO2
	b)	What are the advantages and disadvantages of Tabulation method over Karnaugh - Map method.	4 Marks	L1	CO1	PO1
		(OR)				
4.		Simplify the given Boolean function using Quine - McCluskey method. F (A,B,C,D) = Σm (5,6,7,12,13) + Σd(4,9,14,15).	12 Marks	L4	CO1	PO2

UNIT-III

5.	a)	Construct a 4×16 decoder using 3×8 decoders.	6 Marks	L3	CO2	PO3
	b)	Construct a 16 × 1 multiplexer with two 8 × 1 and one 2 × 1 multiplexers. Use block diagrams.	6 Marks	L3	CO2	PO3
		(OR)				
6.	a)	Construct an Encoder circuit to convert Octal to Binary.	6 Marks	L3	CO2	PO3
	b)	Design and construct a Four-bit by Three- bit binary multiplier circuit.	6 Marks	L3	CO2	PO4

UNIT-IV

7.	a)	Convert D- Flip-Flop into T- Flip-Flop.	6 Marks	L2	CO2	PO2
	b)	Design a MOD8 synchronous counter using T Flip-Flops.	6 Marks	L3	CO2	PO6
		(OR)				
8.	a)	Describe the operation of the SR Latch using NAND gate with the help of truth table, transition table and the circuit.	6 Marks	L2	CO2	PO2

	b)	Design a 4-bit ripple counter using flip-flops that trigger on the negative edge of the clock.	6 Marks	L2	CO2	PO6

UNIT-V

9.		Design PLA by implementing the following Boolean function with AND-OR structure F1 (A,B,C,D) = Σm (2,12,13). F2 (A,B,C,D) = Σm (7,8,9,10,11,12,13,14,15). F_3 (A,B,C,D) = Σm (0,2,3,4,5,6,7,8,10,11,15) . F4 (A,B,C,D) = Σm (1,2,8,12,13).	12 Marks	L3	CO4	PO3

(OR)

10.	a)	Distinguish the following i) PROM ii) PAL iii) PLA.	6 Marks	L1	CO4	PO2
	b)	Realize a Logic function using F (A, B, C) = Σ_m (2,4,5,6) using Hazard Free logic gate network.	6 Marks	L2	CO3	PO7

❀ ❀ ❀

CODE No.: 14BT50301 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations November - 2022

DYNAMICS OF MACHINERY

[MECHANICAL ENGINEERING]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 The following data relate to a connecting rod of a reciprocating engine 14 Marks
Mass = 55 kg
Distance between bearings = 850 mm
Diameter of small end bearing = 75 mm
Diameter of big end bearing = 100 mm, Time of oscillation when connecting rod is suspended from small end = 1.83 sec, Time of oscillation when connecting rod is suspended from big end = 1.68 sec

Determine
a) The radius of gyration of the rod about an axis passing through the C.G perpendicular to the plane of oscillation.
b) The dynamically equivalent system for the connecting rod constituted of two masses, one of which is situated at small end centre.

(OR)

2 A petrol engine with a speed of 3000rpm has a stroke of 8.75cm. The weight of the connecting rod is 1.75kgf. The length of connecting rod from centre to centre is 17.5cm. The centre of gravity from big end centre is 5.75cm. The radius of gyration about an axis through the center of gravity and perpendicular to the connecting rod is 7.5cm. Find the inertia force of the connecting rod and its direction with the centre line of the connecting rod when the crank makes an angle of 40^0 with I.D.C. Also find inertia torque on the crank shaft. 14 Marks

UNIT-II

3 a) Write expression for gyroscopic couple. 7 Marks
b) Each paddle wheel of a steamer has a mass of 1600kg and a radius of gyration of 1.2m. The steamer turns to port in a circle of 160m radius at 24Km/hr. The speed of the paddle is 90 rpm. Find the magnitude and effect of the gyroscopic couple acting on the steamer. 7 Marks

(OR)

4 a) List out the few machines in which flywheel are used. 7 Marks
b) The crank of a three-cylinder single-acting engine is set equally at 1200 the engine speed is 540 rpm. The turning-moment diagram for each cylinder is a triangle for the power stroke with a maximum torque of 100 N-m at 60^0 after dead- centre of the corresponding crank. On the return stroke, the torque is sensibly zero. Determine (i) The power developed (ii) The coefficient of fluctuation of speed if the flywheel has a mass of 7.5 kg with a radius of gyration of 65 mm. 7 Marks

UNIT-III

5 1. A cone clutch with one cone angle 20˚is to transmit 7.5kw at 750rpm. The normal intensity of pressure between the contact faces is not to exceed 0.12 N/mm2. The coefficient of friction is 0.2. if face width is 1/5th of mean diameter, find; 14 Marks

i) The main dimensions of the clutch.
ii) Axial force required while running.

(OR)

6 Summarize with the help of a neat sketch the principles of operation of an internal expanding shoe. Derive the expression for the braking torque. 14 Marks

UNIT-IV

7 a) A mass is attached to a shaft which is rotating at an angular speed of w rad/s. Describe the procedure of balancing this mass by (i). A single mass only (ii). Two masses in different planes. 7 Marks

b) Three masses of 8 kg, 12 kg and 15 kg attached at radial distances of 80 mm, 100 mm and 60 mm respectively to a disc on a shaft are in complete balance. Determine the angular positions of the masses 12 kg and 15 kg relative to 8 kg mass. 7 Marks

(OR)

8 a) Describe the function of a simple watt governor. What is its limitation? 7 Marks

b) Each ball of a Porter governor has a mass of 6 kg and the mass of the sleeve is 40 kg. The upper arms are 300 mm long and are pivoted on the axis of rotation whereas the lower arms are 250 mm long and are attached to the sleeve at a distance of 40 mm from the axis. Determine the equilibrium speed of the governor for a radius of rotation of 150 mm for 1% change in speed. Also find the effort and the power for the same speed change. 7 Marks

UNIT-V

9 A vibrating system consists of a mass 50 kg, a spring of stiffness 30 KN/m and a damper. The damping provided is only 20% of the critical value. Determine: 14 Marks

a) The damping factor.
b) The critical damping coefficient.
c) The natural frequency of damped vibrations.
d) The logarithmic decrement.
e) The ratio of two consecutive amplitudes.

(OR)

10 A disc having a mass of 6 kg, is mounted half way on a 2 cm dia shaft supported at ends by two bearings. The length between the bearing support is 50 cm. Due to manufacturing defects the CG of the disc is 0.01 mm away from the geometric center of the disc. If the system rotates at 2000 rpm. Find the amplitude of steady state vibration and the dynamic force transmitted to the bearings. Take $E = 1.96 \times 10^{11}$ N/ sq m. 14 Marks

CODE No.: 14BT51003 SVEC-14

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations November - 2022

LINEAR AND DIGITAL IC APPLICATIONS

[Electrical and Electronics Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Distinguish between practical and ideal op-amp. Draw its equivalent circuit. 7 Marks

b) With the help of suitable examples, explain how the slew rate affects the frequency response of an op-amp. 7 Marks

(OR)

2 a) Define the following terms: 4 Marks
i) Input bias current. ii) Input offset voltage.

b) Explain the frequency compensation technique in an op-amp. 10 Marks

UNIT-II

3 a) What is a comparator? Discuss the applications of comparators. 7 Marks

b) Design an op-amp differentiator that will differentiate an input signal with $f_{max} = 100$. 7 Marks

(OR)

4 a) Draw the circuit of Current to Voltage converter and explain its operation. 7 Marks

b) Design a first order low pass filter for a high cut-off frequency of 2KHz and pass band gain of 2. 7 Marks

UNIT-III

5 a) Draw and explain the block diagram of IC566 VCO. 7 Marks

b) With a neat sketch, explain the functional diagram of 555 timer in monostable mode. 7 Marks

(OR)

6 a) LSB of a 9-bit DAC is represented by 19.6mV. If an input of 9 zero bits is represented by 0 volts. 6 Marks
i) Find the output of the DAC for an input 101101101 and 011011011.
ii) What is the Full Scale Reading (FSR) of this DAC?

b) Explain any two applications of PLL. 8 Marks

UNIT-IV

7 a) Draw the CMOS inverter circuit and explain in detail. 7 Marks

b) Realize the Boolean function **f = (a' + b) (b + c')** using CMOS transistor circuit. 7 Marks

(OR)

8 a) Which one is the fastest non-saturated logic gate? Explain its operation with circuit diagram. 7 Marks

b) Draw the circuits for **TTL OR** logic gate and **CMOS OR** logic gate and explain their working. 7 Marks

UNIT-V

9 a) Write a Verilog code for SR flip-flop with NAND gates. 7 Marks

b) In Verilog HDL, explain port declaration with example. 7 Marks

(OR)

10 a) Using gate level modeling, design full adder with the help of half adder. 7 Marks

b) Using two 74 x 138 decoders design a 4 to 16 decoder. 7 Marks

CODE No.: 16BT5HS02 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations November - 2022

COSTING AND FINANCE MANAGEMENT FOR CIVIL ENGINEERS

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	Define and explain the approximate estimation of costs.	CO1	14 Marks
	(OR)		
2	Distinguish between relevant and irrelevant costs.	CO2, CO4	14 Marks

UNIT-II

3	An expenditure of Rs.1,92,000 has been incurred on a contract upto the end of 31st March, 2015. The value of work done and certified is Rs.2,10,000. The cost of work done but not yet certified is Rs.12,000. It is estimated that the contract will be completed by 30th June, 2015 and an additional expenditure of Rs.18,000 will have to be incurred to complete the contract. The total estimated expenditure on the contract is to include a provision of 12 ½ per cent for contingencies. The contract price is Rs.2,80,000 and Rs.1,68,000 has been realized in cash up to 31st March, 2015. Calculate the proportion of profit to be taken to Profit and Loss account as on 31st March, 2015 under different methods.	CO1, CO4	14 Marks
	(OR)		
4	Discuss the procedure followed in accounting for costs under contract costing.	CO1	14 Marks

UNIT-III

5	"Flexibility in a budget is an aid to co-ordination, while the budgetary control is an instrument of co-ordination." Elucidate	CO1, CO2	14 Marks
	(OR)		
6	Explain the relationship between budget and budgetary control.	CO1, CO3	14 Marks

UNIT-IV

7	Elucidate the importance of cash flows in business.	CO1	14 Marks
	(OR)		
8	A choice is to be made between two competing proposals which require an equal investment of Rs.50,000 and are expected to generate net cash flows as under. Suggest which proposal should be chosen under Net Present value method.	CO3, CO4	14 Marks

Year	Project I (Rs.)	Project II (Rs.)
1	25,000	10,000
2	15,000	12,000
3	10,000	18,000
4	NIL	25,000
5	12,000	8,000
6	6,000	4,000

The cost of capital of the company is 10%.

UNIT-V

9	Sketch and explain the operating cycle.	CO1	14 Marks
	(OR)		
10	Evaluate the following equation - "Current Assets – Current liabilities = Working Capital"	CO1, CO2	14 Marks

CODE No.: 16BT41204 SVEC-16

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations, November - 2022

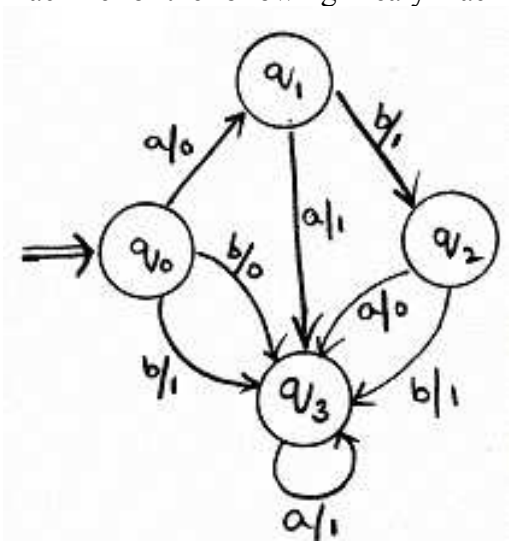
THEORY OF COMPUTATION
[Computer Science and Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

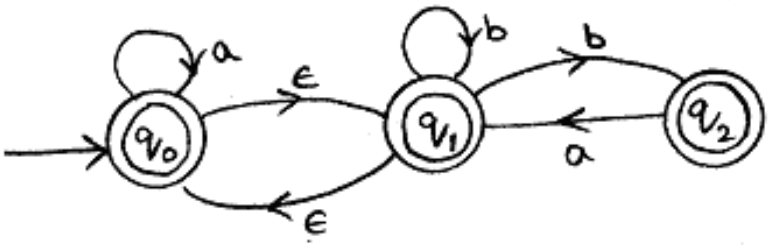
UNIT-I

1	a)	Define the following terms, with an example for each: i) String; ii) Alphabet; iii) Problem; iv) Language	CO1	8 Marks
	b)	Construct Moore machine for the following Mealy machine	CO3	6 Marks



(OR)

2	a)	Construct DFA equivalent to the following Finite automation	CO3	8 Marks



	b)	Draw the NFA accepting the set of all strings whose second symbol from last is 1	CO3	6 Marks

UNIT-II

3	a)	Construct a Finite Automata equivalence to the regular expression (0+1)*(00+11)(0+1)*	CO3	8 Marks
	b)	Write a regular expression to denote a language L which accepts all the strings of 0's and 1's whose number of 0's is divisible by five and whose number of 1's is even.	CO3	6 Marks

(OR)

4	a)	Write a regular expression for the language over the set $\Sigma=\{a, b\}$ in which total number of a's are divisible by. 3.	CO3	6 Marks
	b)	Consider the FA given, construct a regular expression that. is accepted by it.	CO3	8 Marks

	0	1
$\rightarrow q_1$	q_2	q_3
q_2	q_1	q_3
$*q_3$	q_2	q_1

UNIT-III

5	a)	Construct equivalent grammar in Chomsky Normal Form for the grammar $G=(\{S,A,B\},\{a,b\}, \{S\rightarrow aAbB, A\rightarrow aA\|a, B\rightarrow bB\|b\},S)$.	CO2	10 Marks
	b)	Define the following i) Derivation; ii) Parse tree	CO1	4 Marks

(OR)

6	a)	Find the language generated by the grammar : $S\rightarrow 0S1 \mid 0A \mid 0 \mid 1B \mid 1$ $A\rightarrow 0A \mid 0$ $B\rightarrow 1B \mid 1$	CO1	6 Marks
	b)	Discuss in detail about ambiguous grammar and removing ambiguity from grammar.	CO1	8 Marks

UNIT-IV

7	a)	Design PDA for the language $L=\{ww^R \mid w\in\{0,1\}^*\}$..	CO3	10 Marks
	b)	If L is a context free language then prove that there exists a PDA M such that $L = N(M)$.	CO5	4 Marks

(OR)

8	a)	Obtain a PDA to accept the language $\{L = a^n b^n \mid n \geq 1\}$	CO3	12 Marks
	b)	Prove that acceptance by empty stack and by final state is equivalent.	CO2	2 Marks

UNIT-V

9		Design a Turing machine which recognizes palindrome over alphabet {0, 1}.	CO4	14 Marks

(OR)

10		Design a Turing machine M to implement the function "multiplication" using subroutine 'copy'.	CO4	14 Marks

CODE No.: 16BT50101 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations, November - 2022

IRRIGATION ENGINEERING
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define duty, delta and base period. Derive a relationship between the two for a given base period.	CO5	7 Marks
	b)	Find the delta for crop period if the duty for a base period of 150 days is 1600 hectares/cumec.	CO2	7 Marks
		(OR)		
2	a)	What is consumptive use of water? Discuss briefly the factors affecting the consumptive use of water.	CO1	7 Marks
	b)	What do you understand by crop rotation and discuss its advantages?	CO1	7 Marks

UNIT-II

3	a)	What is meant by an intake weir and how does it differ from a surplus weir?	CO1	7 Marks
	b)	Enlist the various functions of a canal head regulator.	CO1	7 Marks
		(OR)		
4	a)	Discuss the Bligh's creep theory for the design of weir constructed over pervious foundation.	CO2	7 Marks
	b)	Compare the Bligh's and Khosla's theories for the design of impervious floor.	CO2	7 Marks

UNIT-III

5	a)	Derive an expression for the limiting height of a low gravity dam, and what are the major differences between low and high gravity dam.	CO5	7 Marks
	b)	Design the practical profile of a gravity dam made of stone masonry given the following data. R.L. of base of the dam = 198m, R.L. of HFL of reservoir =228m, Specific gravity of masonry =2.4m, safe compressive stress in masonry=1200kN/m^3.	CO3	7 Marks
		(OR)		
6	a)	Explain the elementary and practical profile of a gravity dam.	CO1	7 Marks
	b)	What are the criteria to be considered for safe design of earth dams?	CO1	7 Marks

UNIT-IV

7	a)	How will you justify economically the necessity of lining existing canal?	CO1	7 Marks
	b)	Define non-erodible canals. How under-drainage of non-erodible canals are provided?	CO2	7 Marks

(OR)

8	a)	Design the procedure for designing a irrigation channel using Lacey's theory.	CO3	7 Marks
	b)	Explain Kennedy's theory for the design of irrigation channel in alluvial soils.	CO3	7 Marks

UNIT-V

9	a)	Explain the various factors affecting the suitability of aqueduct and siphon aqueduct.	CO1	7 Marks
	b)	How would you estimate the afflux and the uplift pressure on the floor of a siphon aqueduct?	CO7	7 Marks

(OR)

10	a)	Explain the procedure for the design of a level crossing and an inlet-outlet structure.	CO1	7 Marks
	b)	How do you classify Indian rivers and discuss the various stages of a river with salient features of each stage?	CO2	7 Marks

CODE No.: 16BT50102 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations, November - 2022

REINFORCED CEMENT CONCRETE STRUCTURES

[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Show a reinforcement concrete beam section of size 300x700 mm effective depth is reinforced with 3 bars of 20 mm diameter in tension. Determine the moment of resistance and the maximum stresses induced in the materials using working stress method.	CO2	14 Marks
		(OR)		
2		Calculate the area of reinforcement required for a T-beam with the following data. Span = 8 m, ends simply supported, Spacing of beams = 3m, Super imposed load on slab = 3 kN/m^2 Thickness of slab = 130 mm, Weight of wall on beam = 15 kN/m Assume width of web 230 mm, total depth 680 mm, concrete- M20 and steel – Fe250.	CO2	14 Marks

UNIT-II

3	a)	What are the types of reinforcement used to resist shear force?	CO1	4 Marks
	b)	List out the types of reinforcements used to resist shear.	CO1	4 Marks
	c)	Explain briefly the procedure for the design of shear reinforcement.	CO1	6 Marks
		(OR)		
4		Design a cantilever beam of uniform depth for a span of 2.5m, if the superimposed load is 20 kN/m and it is monolithic with R.C column of 300 mm width and 400 mm deep. Use M20 grade concrete and Fe415 steel.	CO3	14 Marks

UNIT-III

5	a)	A Simply supported RCC slab has to be provided for the roof of a room of clear dimensions 3 x 8 m. Width of supporting wall is 300 mm. The weight of weathering course over the slab is 1 kN/m^2. Take the live load on the slab using M 20 grade concrete and HYSD bars. Check the design for stiffness.	CO1	7 Marks
	b)	A Simply supported RCC slab has to be provided for the roof of a room of clear dimensions 3 x 8 m. Width of supporting wall is 300 mm. The weight of weathering course over the slab is 1 kN/m^2. Take the live load on the slab using M 20 grade concrete and HYSD bars. Check the design for stiffness.	CO2	7 Marks
		(OR)		
6		A Simply supported RCC slab has to be provided for the roof of a room of clear dimensions 3 x 8 m. Width of supporting wall is 300 mm. The weight of weathering course over the slab is 1 kN/m^2. Take the live load on the slab using M 20 grade concrete and HYSD bars. Check the design for stiffness.	CO2	14 Marks

UNIT-IV

7	a)	How the compression failures occur in columns.	CO1	7 Marks
	b)	Determine the ultimate load carrying capacity of rectangular column section 400x600mm reinforced with 10nos. of 25mm dia. Use M25 concrete and Fe415 steel.	CO2	7 Marks

(OR)

8		A circular column, 4.6m high is effectively held in position at both ends to carry an axial load of 1200kN, if its dia is restricted to 450mm. Use M20 and Fe425 grade bars.	CO2	14 Marks

UNIT-V

9		Design a suitable footing for a 500 mm x 500 mm square column transferring 100kN axial load and a moment of 35KN-m.The safe bearing capacity of soil is 190 kN/ m^2.Use M20 concrete and Fe415 steel. Adopt limit state design method.	CO3	14 Marks

(OR)

10		A straight stair in residential building is supported on wall on one side and stringer beam on the other side. The risers are 150 mm and treads are 250mm, and the horizontal span of the stair as 1.2m. Design the steps use M20 grade concrete.	CO3	14 Marks

CODE No.: 16BT50103 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations, November – 2022

SOIL MECHANICS
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	If Uniformity coefficient, C_u= 9, and coefficient of curvature, C_c=1 for a soil, what will the ratio of D_{30}/D_{10}?	CO4	6 Marks
	b)	A soil sample collected from the field and observed that the moist soil mass is 1.98 kgs and volume of the mould is 980cc, specific gravity of soil particles is 2.7 and water content is 11% from the laboratory testing. Evaluate the void ratio, dry density and degree of saturation of the soil.	CO2	8 Marks
		(OR)		
2	a)	If a soil sample is having porosity 40% and degree of saturation 80%, what will be its percentage air voids?	CO4	5 Marks
	b)	A soil sample of 3.81cm diameter and 7.62cm height is collected from the field and observed the wet weight of 1.668N and oven dry weight of 1.4N from the laboratory. Also observed the specific gravity as 2.7 in the laboratory. Evaluate the bulk unit weight, dry unit weight, void ratio and degree of saturation.	CO2	9 Marks

UNIT-II

3	a)	In a three layered soil, water flows parallel to that of top and bottom layers. The thickness and permeability of middle layer is twice that of top and bottom layer. What is the average coefficient of permeability for this flow?	CO4	6 Marks
	b)	At a depth of 3m in a sand deposit, when the borehole is made in the month of June, there is no water table observed and the dry unit weight of sand is 16 kN/m^3. How much effective stress decreases, when borehole is made in the month of December, if 1 m height of water is logged above the ground level, i.e., above sand deposit, and the saturated unit weight of sand is 20 kN/m^3.	CO6	8 Marks
		(OR)		
4	a)	The ground water table is lowered from ground level to 5m from the ground surface. If the foundation is made at a depth of 3m, what will be effect on effective stress at the depth of foundation, if the saturated unit weight of soil is 20 kN/m^3?	CO4	5 Marks
	b)	A non-homogeneous soil deposit consists of a silt layer sandwiched between a fine sand layer at top and clay layer below. Permeability of silt layer is 10 times the permeability of the clay layer and 1/10th permeability of sand layer. Thickness of silt layer is 2 times the thickness of sand layer and 2/3rd thickness of clay layer. What is the ratio of equivalent horizontal and equivalent vertical permeability of the deposit?	CO8	9 Marks

UNIT-III

5	a)	What are the assumptions and limitations made in Boussinesq's theory?	CO1	6 Marks
	b)	A rectangular footing with dimensions of 2m x 3m has to carry a uniformly distributed load of 100 kN/m^2. Plot the distribution of vertical stress intensity due to this load on a horizontal plane at a depth of 2 m below the base of the footing by Boussinesq's method.	CO2	8 Marks

(OR)

6	a)	What are the field methods for compacting soils and explain them?	CO1	6 Marks
	b)	The mass of a moist soil sample collected from the field is 465 grams, and its oven dry mass is 405.76 grams. The specific gravity of the soil solids was determined in the laboratory to be 2.68. If the void ratio of the soil in the natural state is 0.83, find the following: i) The moist density of the soil in the field (kg/m^3). ii) The dry density of the soil in the field (kg/m^3) . iii) The mass of water, in kilograms, to be added per cubic meter of soil in the field for saturation.	CO6	8 Marks

UNIT-IV

7	a)	What are the difference between compaction and consolidation?	CO1	6 Marks
	b)	An Oedometer test is performed on a 2 cm thick clay sample. After 5 minutes, 50% consolidation is reached. After how long a time (Days) would the same degree of consolidation be achieved in the field when the clay layer is 4.0m thick? Assume the sample and the clay layer have the same drainage conditions. (Double drainage).	CO7	8 Marks

(OR)

8	a)	Define pre-consolidation pressure. How can you determine it from an oedometer test?	CO1	6 Marks
	b)	The time required for 50% consolidation of a 25mm thick clay layer (drained at both top and bottom) in the laboratory is 2 min 20secs. How long (in days) will take for 3m thick clay layer of the same clay in the field under the same pressure increment to reach 50% consolidation? In the field, there is a rock layer at the bottom of the clay.	CO2	8 Marks

UNIT-V

9	a)	Describe the Mohr-Coulomb failure theory and draw the failure envelopes for various types of soils.	CO3	6 Marks
	b)	Two drained triaxial tests are performed on the material. In the first test the all-round pressure is 200 kN/m^2 and failure occurs at an added axial stress of 600 kN/m^2. In the second test all-round pressure is 350 kN/m^2 and failure occurs at an added axial stress of 1050 kN/m^2. What values of c' and ø' correspond to these results?	CO2	8 Marks

(OR)

10		A thin layer of silt exists at a depth of 18 m below the surface of the ground. The soil above this level has an average dry density of 1.53 Mg/m^3 and an average water content of 36%. The water table is almost at the surface. Tests on undisturbed samples of the silt indicate the following values: C_u= 45 kN/m^2; $ø_u$= 18°; c'= 35 kN/m^2; ø'= 27° Estimate the shearing resistance of the silt on a horizontal plane, (a) when the shear stress builds up rapidly and (b) when the shear stress builds up very slowly.	CO2	14 Marks

CODE No.: 16BT50104 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations, November – 2022

STRUCTURAL ANALYSIS-II
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	A uniformly distributed load of 20 kN/m and 4 m long rolls over a girder of span 16 m. Find the equivalent uniformly distributed load.	CO2	4 Marks
	b)	A girder having a span of 18 m is simply supported at the ends. It is traversed by train loads of 150 kN, 150 kN, 250 kN and 100 kN with 100 kN load leading. The spacing between the loads is 3 m for all loads. Determine the maximum shear force and bending moment at the mid-span of the beam.	CO2	10 Marks

(OR)

2	a)	A single point load of 80 kN crosses a girder of 12 m span. Using influence lines, find the maximum positive and negative shear forces at a point 4 m from the left end.	CO2	7 Marks
	b)	A uniformly distributed load of 500 kN/m longer than the span, rolls over a beam of span 25 m. Using influence lines determine the maximum bending moment at a section 10 m from the left end.	CO2	7 Marks

UNIT-II

3		Analyse the continuous beam ABCD shown in Fig.1, if support C sinks by 10 mm. Take E = 2 x 10^5 N/mm^2 and I = 4 x 10^7 mm^4.	CO2	14 Marks

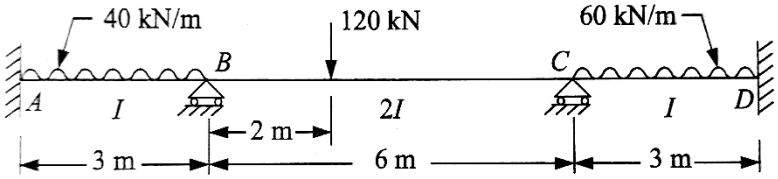


Fig. 1

(OR)

4		Analyse the continuous beam shown in Fig.2 by moment distribution method and draw the bending moment and shear force diagram.	CO6	14 Marks

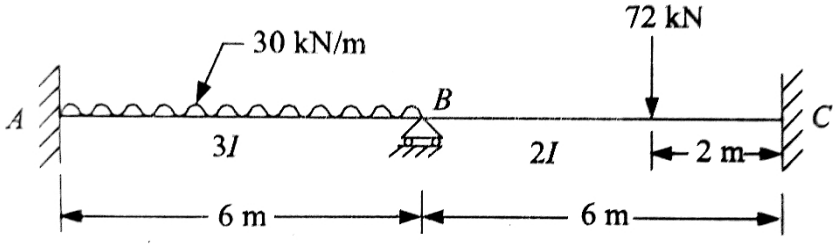


Fig. 2

UNIT-III

5 Analyse the frame shown in Fig. 3 by Kani's method. CO4 14 Marks

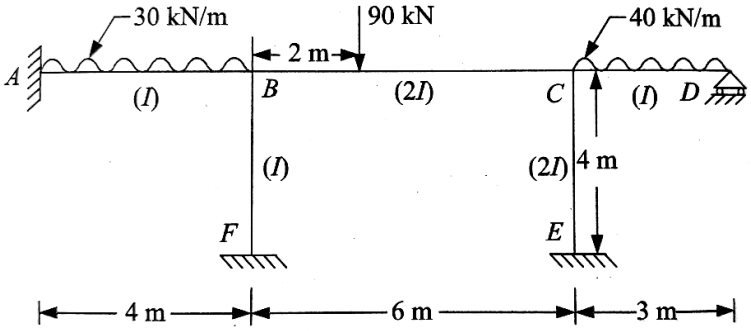


Fig. 3

(OR)

6 a) Derive the expression for strain energy due to bending moment. CO1 7 Marks

b) Determine the deflection under 60 kN load in the beam shown in Fig.4. CO2 7 Marks

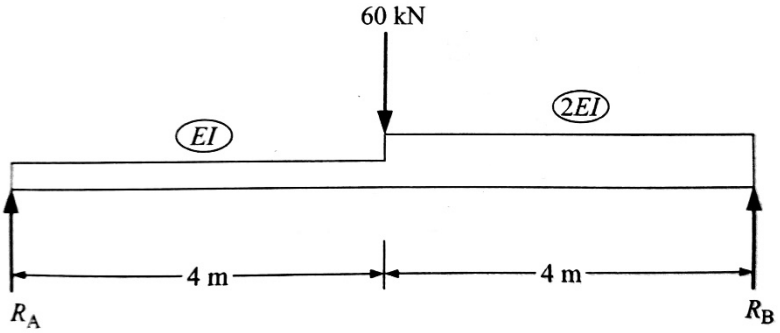


Fig. 4

UNIT-IV

7 Analyze the truss shown in Fig. 5 by Castigliano's theorem. Area of cross section of members in mm^2 is shown in brackets. E is constant throughout. CO4 14 Marks

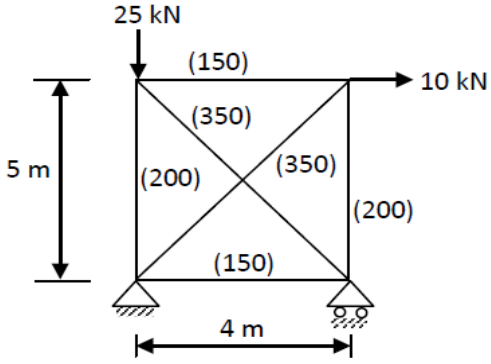


Fig. 5

(OR)

8 Find the forces in all the members of the pin-jointed frame work as shown Fig. 6. All the members have the same area of cross section and Young's modulus. CO2 14 Marks

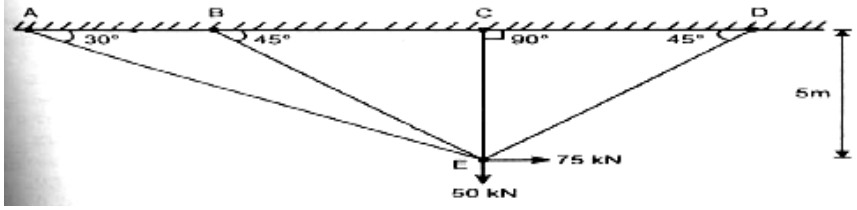


Fig. 6

UNIT-V

9	a)	Derive the moment curvature relationship in plastic analysis.	CO1	7 Marks
	b)	A T-section consists of a flange 150x10mm and a web of 140x10mm. The section modulus of the T-section is 54600mm^3. This section is used as a simply supported beam of 4m span and carries a UDL of 25kN/m on the whole span. Determine the shape factor of the beam and also calculate the collapse load for the beam. Assume yield stress as 250 Mpa.	CO3	7 Marks

(OR)

10		Calculate the plastic moment capacity required for the continuous beam with working loads shown in Fig. 7.	CO3	14 Marks

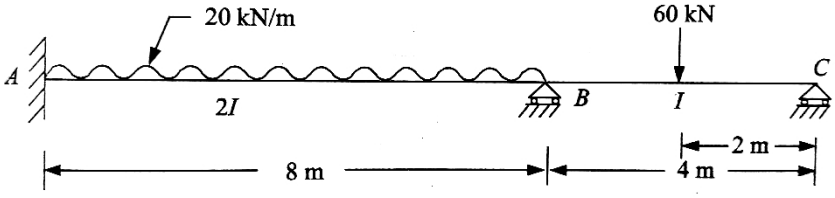


Fig. 7

CODE No.: 16BT50105 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations, November - 2022

WASTE WATER TECHNOLOGY
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	A city with a population of 100,000 has an area of 50km^2. Rate of water supply is 110 litres per capita per day of which 80% turns into sewer. The average run-off coefficient is 0.5 and intensity of rainfall is 14.5mm/hr. Estimate the quantity of combined sewage. Take peak factor as 2.5.	CO3	7 Marks
	b)	Describe conservancy and water carriage system and explain their relative advantages and disadvantages to recommend suitable solutions in collection, treatment and disposal of sewage.	CO4	7 Marks
		(OR)		
2	a)	Explain the principle of working of oil and grease trap. Mention the reasons for excluding grease and oil from sewage.	CO1	7 Marks
	b)	Calculate the diameter of a separate sewer section running half full at maximum discharge for a town with a population of 1,00,000. Water is supplied at a rate of 200 LPCD. Assume 80% of water supply turns as sewage. Take peak factor = 2.25 and n = 0.013 at all depth. Permissible slope is 1 in 600.	CO3	7 Marks

UNIT-II

3	a)	Explain the various Physico-chemical characteristics of sewage and state their environmental significance.	CO2	7 Marks
	b)	The BOD of sewage incubated for one day at 30°C has been found to be 400 mg/l. Calculate the 5 day BOD@20°C. Assume kd= 0.12/day at 20°C.	CO2	7 Marks
		(OR)		
4	a)	Explain the terms BOD and COD. How these parameters are useful in treatment of sewage and disposal standards.	CO6	7 Marks
	b)	Design a rectangular sedimentation tank for treating 12MLD adopting L:B ratio as 2.5 and overflow rate 40m^3/m^2/day. Assume Detention Time as 2 hours.	CO3	7 Marks

UNIT-III

5	a)	Explain different aeration practices in Activated Sludge Process viz i) Tapered Aeration ii) Step aeration and iii) Extended aeration.	CO1	7 Marks
	b)	Examine the size of standard rate trickling filter to treat 6 million litres of sewage per day having BOD of 160 mg/l. Take hydraulic loading of 6m^3/m^2/d and organic loading of 0.35kg/m^3/d.	CO3	7 Marks
		(OR)		
6	a)	Discuss in detail with neat sketches about the effective use of trickling filters and communicate the various advantages and disadvantages of trickling filters	CO9	7 Marks
	b)	Calculate and design an oxidation ditch for a design sewage flow of 50MLD. Assume suitable data wherever necessary. Show the neat sketch of the designed unit.	CO3	7 Marks

UNIT-IV

7	a)	Discuss the need for sludge dewatering and explain the various sludge dewatering methods.	CO5	7 Marks
	b)	Describe briefly the heat treatment method of sludge conditioning.	CO5	7 Marks
		(OR)		
8	a)	Explain briefly about the characteristics of sludge.	CO2	5 Marks
	b)	What is land treatment? Discuss the conditions under which it is suitable.	CO1	9 Marks

UNIT-V

9	a)	Summarize the principle of the self-purification process of river and the various stages of oxygen sag curve.	CO1	7 Marks
	b)	What is sewage farming? List the methods and state its advantages over the method of disposal of sewage by dilution.	CO1	7 Marks
		(OR)		
10	a)	Give the various effluent standards for waste water disposal into inland water bodies and ocean.	CO8	7 Marks
	b)	Design a septic tank with dispersion pit for a hostel with a population of 150 and peak discharge of 205 Lit Per Min. Take desludging period as one year. Assume suitable design criteria and draw a neat sketch of the designed septic tank.	CO3	7 Marks

CODE No.: 16BT50201 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations, November – 2022

CONTROL SYSTEMS

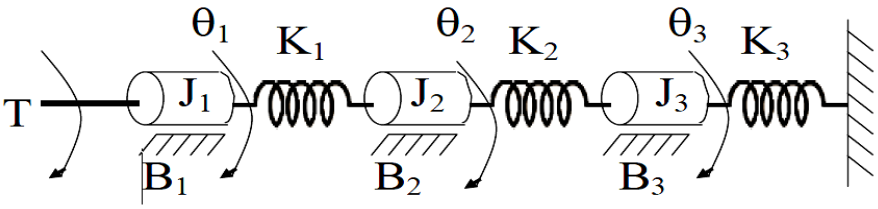
[Electrical and Electronics Engineering, Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks

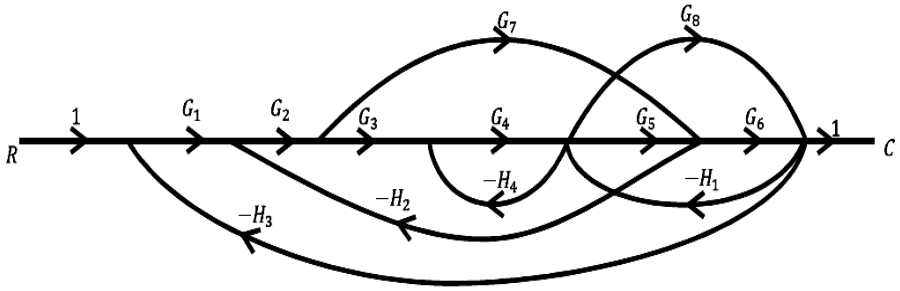
UNIT-I

1	a)	Explain in detail with a neat block diagram, how closed loop system is more effective by taking traffic control system as an example.	CO1	6 Marks
	b)	Write the differential equations and determine the transfer function $\frac{\theta_1(s)}{T(s)}$ of the given mechanical system.	CO4	8 Marks



(OR)

2	a)	Determine the overall gain of the system using Masson's gain formulae.	CO4	7 Marks



	b)	Derive the transfer function of field controlled DC motor and draw the block diagram.	CO4	7 Marks

UNIT-II

3	a)	Derive the expression for the rise time, peak time, peak overshoot and settling time in time domain analysis.	CO2	7 Marks
	b)	The open loop transfer function of a unity feedback system is $G(s) = \frac{20}{s(s+2)(s+5)}$. Find the steady state error when it is subjected to input $r(t) = 5 + 3t + 4t^2$.	CO4	7 Marks

(OR)

4		Sketch the complete root locus for a system with an open loop transfer function $G(s)H(s) = \frac{K}{S(S+2)S^2+2s+2}$. Also find the marginal value of K for system stability.	CO4	14 Marks

UNIT-III

5	a)	Explain the procedure to construct polar plot and to find gain margin and phase margin.	CO1	6 Marks
	b)	The open loop transfer function of a system is given by $G(s) = \frac{K}{S(1+0.1S)(1+S)}$. Determine the value of K for: i) gain margin = 6 db; ii)phase margin = 40^0.	CO5	8 Marks

(OR)

6		Sketch the Bode plot for the given system and determine the system gain K for the gain cross over frequency to be 10 rad/sec. Comment on the stability of the system for K=1. $G(s) = \frac{Ks^2}{(1+S)(1+0.01S)(1+0.1S)}$.	CO5	14 Marks

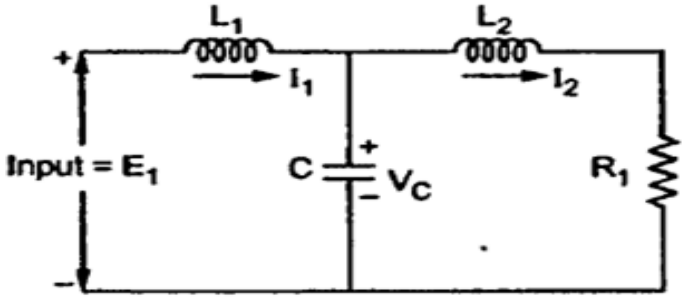
UNIT-IV

7	a)	Explain how series RLC circuit acts as a lag compensator, also draw the pole zero plot.	CO6	7 Marks
	b)	Explain the effect of PI controller on various performance specifications of a second order system.	CO1	7 Marks

(OR)

8		The open loop transfer function of a unity feedback system is $G(s) = \frac{K}{S(S+1)(1+0.1s)}$. Design a phase lag compensator to meet the following specifications. i) velocity error constant $K_v = 10$; ii) phase margin = 35^0. Also compare the cross over frequencies of the un compensated and compensated systems.	CO3	14 Marks

UNIT-V

9	a)	Obtain the state model for the given transfer function: $T(s) = \frac{2}{(S^3+2S^2+4S+8)}$	CO2	7 Marks
	b)	Obtain the state model of a given electrical system by taking voltage across capacitor as output. 	CO2	7 Marks

(OR)

10	a)	Explain the concept of controllability and observability.	CO1	7 Marks
	b)	Obtain the time response of the following system with: $\begin{bmatrix}\dot{X}_1\\ \dot{X}_2\end{bmatrix} = \begin{bmatrix}1 & 0\\ 1 & 1\end{bmatrix}\begin{bmatrix}X_1\\ X_2\end{bmatrix} + \begin{bmatrix}1\\ 1\end{bmatrix}u, \quad X_0 = \begin{bmatrix}1\\ 0\end{bmatrix}$	CO4	7 Marks

❀ ❀ ❀

CODE No.: 16BT50241 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations, November - 2022

RENEWABLE ENERGY
[Civil Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Define the following terms used in solar radiation i) Solar Constant ii) Incident Angle iii) Zenith angle iv) Solar azimuth angle v) Altitude angle vi) Hour angle vii) Declination angle	CO1	14 Marks
		(OR)		
2		Describe in detail about the environmental impacts by the usage of renewable as well as non-renewable energy sources for energy conversion.	CO1	14 Marks

UNIT-II

3		Write short notes on i) Heat extraction from a solar pond. ii) Chemical energy storage method iii) Maintenance of stable density gradient in a solar pond. iv) Electromagnetic energy storage.	CO1	14 Marks
		(OR)		
4		Write short notes on i) Solar distillation ii) Solar pumping iii) Solar cooking iv) Solar cell	CO1	14 Marks

UNIT-III

5		Describe in detail about the performance of wind machines with neat sketch.	CO1	14 Marks
		(OR)		
6	a)	Explain in detail about the Geothermal potential in India.	CO1	7 Marks
	b)	Write short notes on the environment aspects of wind energy.	CO1	7 Marks

UNIT-IV

7	a)	Explain the comparison between open cycle and closed cycle OTEC systems.	CO1	7 Marks
	b)	Describe in detail about the settings of OTEC plants	CO1	7 Marks
		(OR)		
8		Discuss in detail about mini and micro hydel power plants and their economics.	CO1	14 Marks

UNIT-V

9		Describe in detail the utilization of biogas for the operation of CI and SI engines with neat sketches.	CO1	14 Marks
		(OR)		
10	a)	Explain briefly about the methods of energy extraction from the Biomass.	CO1	7 Marks
	b)	How the biogas plants are classified and explain them briefly.	CO1	7 Marks

CODE No.: 16BT50301 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations, November - 2022

DESIGN OF MACHINE ELEMENTS-II
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		The load on the journal bearing is 150 kN due to turbine shaft of 300 mm diameter running at 1800 r.p.m. Determine the following : i) Length of the bearing if the allowable bearing pressure is 1.6 N/mm^2, and ii) Amount of heat to be removed by the lubricant per minute if the bearing temperature is 60°C and viscosity of the oil at 60°C is 0.02 kg/m-s and the bearing clearance is 0.25 mm.	CO2	14 Marks

(OR)

2		Write the design procedure for journal bearing.	CO1	14 Marks

UNIT-II

3		Select a single row deep groove ball bearing for a radial load of 4000 N and an axial load of 5000 N, operating at a speed of 1600 r.p.m. for an average life of 5 years at 10 hours per day. Assume uniform and steady load.	CO4	14 Marks

(OR)

4		A single row deep groove ball bearing operating at 2000 r.p.m. is acted by a 10 kN radial load and 8 kN thrust load. The bearing is subjected to a light shock load and the outer ring is rotating. Determine the rating life of the bearing.	CO6	14 Marks

UNIT-III

5		A cast steel spur gear pinion having 24 teeth and rotating at 1800 rpm is required to transmit 9kW to a high grade to run at 600rpm. The teeth are 14.5^o Involute form. Design the gears completely.	CO3	14 Marks

(OR)

6		Design a pair of helical gears to transmit 20kW at 1200 rpm of pinion. The velocity ratio is 3:1 pinion has 24 teeth and is made of 0.3% carbon steel untreated. The gear is made of cast steel. The teeth are 14.5^o Involute form in normal plane. Helix angle is 25^o.	CO3	14 Marks

UNIT-IV

7	a)	Write the design a procedure of helical spring	CO1	8 Marks
	b)	A cantilever beam of rectangular cross-section is 1200mm long. The allowable bending stress for the material used is 420MPa. It is fixed at one end and carries a load of 900N at its free end. Take E= 210GPa. Find its width and thickness. The deflection is not to exceed 120 mm.	CO2	6 Marks

(OR)

8 Table below gives the particulars of concentric helical springs. If the spring is subjected to an axial load of 400N. Determine for each spring. CO2 14 Marks

Determine for each spring:

i) The load shared,

ii) The change in length and

iii) The torsional shear stress induced. Take G=84GPa.

Sl No.	Particulars	Outer Spring	Inner Spring
1	Wire diameter	4.875 mm	4 mm
2	Mean coil diameter	40 mm	30 mm
3	No. of active coils	10	8
4	Free Length	90 mm	75 mm

UNIT-V

9 a) Derive the relation for the ratio of driving tensions of a V-belt. CO5 7 Marks

b) Determine the dimensions of cross section of the connecting rod for a diesel engine with the following data. CO2 7 Marks

Cylinder bore = 100 mm
Length of connecting rod = 350 mm
Maximum gas pressure = 4 MPa
Factor of safety = 6.

(OR)

10 Write a note on: CO1 14 Marks

i) The materials suitable for engine cylinders.

ii) Construction of V-Belts

iii) Factor of safety in wire ropes

CODE No.: 16BT50302 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations, November - 2022

INDUSTRIAL ENGINEERING AND MANAGEMENT
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Briefly describe the evolution of management thought.	CO1	6 Marks
	b)	Discuss the different types of managerial skills in conjunction with various levels of management.	CO5	8 Marks
		(OR)		
2		What is the need for systems approach to management? Explain.	CO4	14 Marks

UNIT-II

3		Enumerate various maintenance practices and discuss their relative advantages and disadvantages.	CO1	14 Marks
		(OR)		
4	a)	Discuss the following terms with examples i) Failure density, ii) Failure rate, iii) MTTF, v) MTBF	CO1	5 Marks
	b)	A four wheel car uses four identical tyres and has an identical tyre as a standby. If the failure rate of each tyre is 6.5 for 10^6 km, what is the probability that the car will not fail due to tyre failure in 10000 km of running? What is the increase in reliability, if you add one more tyre as stand by?	CO4	9 Marks

UNIT-III

5		Define work sampling. List and explain the procedural steps involved in work sampling.	CO3	14 Marks
		(OR)		
6		Define performance rating. List and explain different types of performance rating and also state its importance for improving productivity.	CO2	14 Marks

UNIT-IV

7	a)	Define value analysis. Also give its importance to minimize the burden of inventory in the organization.	CO4	7 Marks
	b)	Give the procedure of purchasing and also state how it correlates to stores management.	CO2	7 Marks
		(OR)		
8		Define materials management. Explain the procedure involved in stores management using VED analysis.	CO1	14 Marks

UNIT-V

9		List the general safety rules in industry for industrial safety and also explain the duties of plant safety inspector.	CO6	14 Marks
		(OR)		
10		Explain single and double sampling plans in controlling the quality using the block diagram.	CO1	14 Marks

CODE No.: 16BT50303 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations, November – 2022

METROLOGY AND MEASUREMENTS

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Define the following terms: i) Accuracy; ii) Precision; iii) Range.	CO1	6 Marks
	b)	List out the various instruments used for linear measurement. With the help of neat sketch explain the working of vernier Calipers and Micrometer gauge.	CO2	8 Marks

(OR)

2	a)	Draw the conventional diagram of limits and fits and explain the terms: i) Basic Size; ii) Upper Deviation; iii) Lower Deviation.	CO1	6 Marks
	b)	Determine the tolerances on the hole and the shaft for a precision running fit designated by 20 H7e8. Also determine the allowance and maximum clearance.	CO3	8 Marks

UNIT-II

3	a)	Explain Taylors Principle of gauges.	CO1	6 Marks
	b)	Describe the method of magnification involved in pneumatic Comparator. Also explain its working principle.	CO5	8 Marks

(OR)

4	a)	List out the possible sources of errors in Sine bars.	CO2	4 Marks
	b)	Find the minimum no of angle gauges required to measure following angles using standard gauge in degrees 1,3,9,27 and 41 minutes 1, 3, 9, and 27 ; seconds 3, 6, 18 and 30. i) 24º 3’; ii) 32º 50’ 54”.	CO3	10 Marks

UNIT-III

5	a)	Describe with the help of neat sketch the principle and construction of NPL flatness Interferometer.	CO3	8 Marks
	b)	Explicate the working of Optical flat with a neat sketch.	CO2	6 Marks

(OR)

6	a)	Define the following terms. i) Roughness; ii) Waviness; iii) Lay. iv) Sampling length.	CO1	6 Marks
	b)	Describe the construction and working of Talysurf surface roughness measuring instrument with neat sketch.	CO3	8 Marks

UNIT-IV

7	a)	Illustrate the basic nomenclature of external screw thread and mention various elements.	CO1	4 Marks
	b)	Describe the methods of computing the effective diameter, angle of thread and thread pitch by three wire methods.	CO5	10 Marks

(OR)

8	a)	Enumerate various types of errors in gear measurement.	CO1	4 Marks
	b)	Derive the expression of gear setting parameters by using chordal thickness method.	CO2	6 Marks
	c)	Calculate the setting of the gear tooth vernier to inspect a gear having 40 teeth and module 5 mm.	CO3	4 Marks

UNIT-V

9	a)	Define the term gauge factor and derive the expression.	CO1	6 Marks
	b)	Describe the method of measuring a strain in half bridge circuit.	CO5	8 Marks

(OR)

10	a)	Define the term pressure and classify the various types of pressure Measuring instruments.	CO1	6 Marks
	b)	Compare the working principle of RTD, thermocouple and thermistor.	CO3	8 Marks

CODE No.: 16BT50304 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations, November – 2022

REFRIGERATION AND AIR CONDITIONING
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	What is the need of air conditioning of air-crafts at high altitudes where ambient temperatures are very low?	CO1	6 Marks
	b)	A refrigerator working on Bell-Coleman cycle (Reverse Brayton cycle) operates between 1 bar and 10 bar. Air is drawn from cold chamber at -10ºC. Air coming out of compressor is cooled to 50ºC before entering the expansion cylinder. Polytropic law $PV^{1.3}$ = constant is followed during expansion and compression. Find theoretical C.O.P of the origin. Take 1.4γ= and C_P= 1.00 kJ/kg ºC for air.	CO2	8 Marks

(OR)

2	a)	Explain refrigeration system using Brayton cycle and show the state points on Temperature-Entropy diagram considering the irreversibilities.	CO1	6 Marks
	b)	A dense air refrigeration machine operating on Bell-Coleman cycle operates between 3.4 bar and 17 bar. The temperature of air after the cooler is 15ºC and after the refrigerator is 6ºC. For a refrigeration capacity of 6 tonnes, find: i) Temperature after compression and expansion, ii) Air circulation required in the cycle per minute, iii) Work of compressor and expander, iv) Theoretical C.O.P and v) Rate of water circulation required in the cooler in kg/min, if the rise in temperature is limited to 30ºC.	CO3	8 Marks

UNIT-II

3	a)	Discuss the effect of sub-cooling on COP. Would you desire large sub-cooling and why?	CO1	6 Marks
	b)	A vapour compression refrigerator uses R-12 as refrigerant and the liquid evaporates in the evaporator at -15ºC. The temperature of this refrigerant at the delivery from the compressor is 15ºC when the vapour is condensed at 10ºC. Find the coefficient of performance if the liquid is cooled by 5ºC before expansion by throttling. Take specific heat at constant pressure for the superheated vapour as 0.64kJ/kg K and that for liquid as 0.94 kJ/kg K. the other properties of refrigerant are as follows:	CO4	8 Marks

Temperature ^{0}C	Liquid heat (kJ/kg)	Latent heat (kJ/kg)	Entropy of liquid (kJ/kg K)	Entropy of Vapour (kJ/kg K)
-15	22.3	180.88	0.0904	0.7051
10	45.4	191.76	0.1750	0.6921

(OR)

4	a)	Draw the vapour compression refrigeration cycle on T-s diagram when the refrigerant is dry and saturated at the end of compression and find an expression for the C.O.P in terms of i) Temperature and entropies; ii) Enthalpy	CO1	7 Marks
	b)	A refrigerator using Ammonia works between the temperatures -10 deg. C and 25 deg. C. The gas is dry at the end of compression and there is no under cooling of liquid. Using the tables, Calculate the theoretical COP of the cycle	CO2	7 Marks

UNIT-III

5	a)	What is the effect of inert gas in three fluid refrigeration systems?	CO1	7 Marks
	b)	Draw a neat diagram of lithium bromide water absorption system and explain its working.	CO1	7 Marks

(OR)

6	a)	What are the characteristics of ideal absorbent and refrigerant mixture in vapour absorption refrigeration?	CO1	7 Marks
	b)	Draw a neat sketch of a practical vapour absorption refrigeration cycle. Indicate there on the phases of various fields and the name of the equipments. Also indicate the direction of the external energy flow to or from the equipments.	CO4	7 Marks

UNIT-IV

7		An auditorium of 100 seating capacity of conditioned for the given specifications: Out door conditions - 35 and 65% RH Required air inlet conditions – 15ºC and 40 RH. The required condition is achieved first by cooling and dehumidifying and then by heating. Find the following i) The capacity of the cooling coil in tons of refrigeration ii) Capacity of the heating coil in kW iii) By-pass factor of the heating coil if the surface temp of the coil is 22 ºC.	CO5	14 Marks

(OR)

8	a)	Define the term `bypass` factor used for cooling or heating coil and find the expression for that.	CO1	6 Marks
	b)	The amount of air supplied to an air conditioned hall is 300 m^3/min. The atmospheric conditions are 35ºC DBT and 55% RH. The required conditions are 20ºC DBT and 60% RH. Find the Sensible Heat and Latent Heat removed from air per minute.	CO6	8 Marks

UNIT-V

9	a)	Compare the viscous impingement filter with dry filter.	CO1	7 Marks
	b)	Write short notes on air-washer type humidifier.	CO1	7 Marks

(OR)

10	a)	Discuss the common considerations for humidification of air in air conditioning.	CO1	7 Marks
	b)	With a simple sketch explain the principle of centrifugal dust collector.	CO1	7 Marks

CODE No.: 16BT50305 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations, November – 2022

THERMAL ENGINEERING-II
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Comment the efficiency of the Modified Rankine cycle with respect to Rankine cycle. Also obtain the expression for efficiency of Modified Rankine cycle.	CO1	7 Marks
	b)	A basic steam power plant works on ideal Rankine cycle between 30 bar and 0.04 bar. The initial condition of steam being 0.8 dry and flow rate 10 kg/s determine i) Work required for pumping ii) Work done by the turbine iii) Cycle efficiency.	CO2	7 Marks

(OR)

2	a)	State functions of various mountings and accessories of a boiler.	CO1	7 Marks
	b)	Discuss the working of Benson boiler with a neat sketch.	CO1	7 Marks

UNIT-II

3	a)	Mention steps involved in preparing the heat balance sheet for a boiler.	CO1	7 Marks
	b)	A boiler working at a pressure of 20 bar evaporates 10 kg of water per kg of coal fired from feed water entering at 40^0C. The steam at the inlet of the stop valve is 0.9 dry. Determine the equivalent evaporation from and at 100^0C.	CO2	7 Marks

(OR)

4	a)	Derive the expression for the draught produced in terms of water column.	CO2	7 Marks
	b)	Calculate the height of chimney required to produce a draught equivalent to 1.7cm of water if the flue gas temperature is 270^0C and ambient temperature is 22^0C and minimum amount of air per kg of fuel 17kg.	CO4	7 Marks

UNIT-III

5	a)	Explain the supersaturated flow of steam through a nozzle and the significance of Wilson's line.	CO1	7 Marks
	b)	Steam enters a group of nozzles of a steam turbine at 12 bar and 220^0C and leaves at 1.2 bar. The steam turbine develops 220KW with a specific steam consumption of 13.5 kg/KWh. If the diameter of nozzles at throat is 7mm, calculate the number of nozzles.	CO5	7 Marks

(OR)

6	a)	Show by graphical representation of pressure and velocity of a steam in impulse turbine.	CO1	7 Marks
	b)	In a De-Lavel turbine, the steam enters the wheel through a nozzle with a velocity of 500 m/s and at an angle of 20° to the direction of motion of the blade. The blade speed is 200 m/s and the exit angle of the moving blade is 25°. Find the inlet angle of moving blade, exit velocity of steam and its direction and work done per kg of steam.	CO3	7 Marks

UNIT-IV

7		At a stage of Reaction Turbine, the Rotor diameter is 1.4 m and speed ratio 0.7.If the blade outlet angle is 20° and the rotor speed 3000 rpm. Find the blade inlet angle and diagram efficiency. Also find the %increase in diagram efficiency and rotor speed, if the Turbine is designed to run at best theoretical speed.	CO3	14 Marks

(OR)

8	a)	Compare the merits and demerits of surface condensers over jet condensers	CO1	7 Marks
	b)	The following were obtained from the test of a surface condenser. Condenser vacuum=711 mm of Hg, hot well temperature=32°C, Inlet temperature of circulated water =12°C, outlet temperature of circulated water=28°C, Barometric reading=760 mm of Hg. Compute the vacuum efficiency and efficiency of condenser.	CO5	7 Marks

UNIT-V

9	a)	Differentiate between closed cycle and open cycle gas turbine.	CO1	7 Marks
	b)	The pressure ratio of an open cycle gas turbine power plant is 5.6. Air is taken at 30^0C and 1 bar. The compression is carried out in 2 stage with perfect intercooling in between the maximum temperature of the cycle is limited to 700^0C. Assuming the isentropic efficiency of each compressor stage as 85% and that of a turbine as 90%. Determine power output if mass flow rate of air is 1.2kg/s and efficiency cycle if C_P=1.02kJ/kg-K and γ =1.41.	CO2	7 Marks

(OR)

10	a)	Discuss the principle of operation of ram jet engine with a neat sketch.	CO1	7 Marks
	b)	A gas-turbine unit has a pressure ratio of 10/1 and a maximum cycle temperature of 700°C. The isentropic efficiencies of the compressor and turbine are 0.82 and 0.85 respectively. Calculate the power output of an electric generator geared to the turbine when the air enters the compressor at 15°C at the rate of 15 kg/s. Take Cp=1.005 kJ/kg-K and γ=1.4 for compression process, and take Cp=1.11 kJ/kg-K and γ=1.333 for the expansion process.	CO2	7 Marks

CODE No.: 16BT50402 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations, November - 2022

MICROPROCESSORS AND MICROCONTROLLERS
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Suggest the criterion for choosing level of programming for developing system software centered around Intel 8086.	CO6	7 Marks
	b)	Develop an ALP to evaluate the product of two 16-bit Hexadecimal Numbers.	CO4	7 Marks
		(OR)		
2	a)	Mention the role of Direction flag while performing string operations with example?	CO1	7 Marks
	b)	Compose an Assembly Language Program to Explore usage of 8086 String related Instructions with a suitable examples.	CO4	7 Marks

UNIT-II

3	a)	Design the timing diagram of memory Read and write cycle in minimum mode configuration.	CO3	7 Marks
	b)	Illustrate control flags? Describe maskable and non-maskable interrupts available in 8086?	CO1	7 Marks
		(OR)		
4	a)	Formulate the sequence of initializing and operating steps necessary to program 8259A.	CO3	7 Marks
	b)	Illustrate types of Intel 8086 interrupts and Outline their default priorities.	CO1	7 Marks

UNIT-III

5	a)	Summarize different modes in which the ports of 8255A can be operated and explain 8255A control word formats.	CO2	7 Marks
	b)	Apply the Mode set control word needed to initialize an 8255A for following requirements: Port A - handshake input, Port B - handshake output, Port C - bits PC6, PC7 as outputs.	CO3	7 Marks
		(OR)		
6	a)	Apply interfacing concept to explain about interfacing ADC with Intel 8086 using 8255.	CO5	10 Marks
	b)	Give the expression to count the rotating shaft of the stepper motor through a specified angle? Design flowchart to Initialize 8251A to send and receive characters on polled basis.	CO2	4 Marks

UNIT-IV

7	a)	Define addressing mode? List addressing modes supportable for 8051 with suitable examples.	CO1	7 Marks
	b)	Explain the following 8051 instructions i) XCHD; ii) SWAP; iii) DJNZ.	CO2	7 Marks
		(OR)		
8	a)	Interpret 8051 SMOD and SCON Special Function Register formats.	CO2	7 Marks
	b)	List the hardware features of 8051 Microcontroller.	CO1	7 Marks

UNIT-V

9	a)	Apply 8051Microcontroller interfacing concept to interface 4 digits of 7 segment LED display to Intel 8051	CO6	10 Marks
	b)	Draw and explain the format of SCON and SMOD.	CO1	4 Marks
		(OR)		
10	a)	Draw and discuss the formats and bit definitions of the following SFR's in 8051. i) PSW; ii) TMOD.	CO1	7 Marks
	b)	Model the setup and develop an ALP to operate different modes of operating Timers/Counters in 8051.	CO6	7 Marks

CODE No.: 16BT50403 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations November - 2022

VLSI DESIGN

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain how a bipolar NPN transistor is included in N well CMOS processing.	CO5	7 Marks
	b)	For a CMOS inverter, calculate the shift in the transfer characteristic curve when βn/βp ratio is varied from 1/1 to 10/1.	CO3	7 Marks
		(OR)		
2	a)	Suggest a step-by-step procedure for a typical n-well process with neat diagrams.	CO5	7 Marks
	b)	For the inverter circuit shown in Fig.1 give the expression for the energy drawn from supply VDD to charge capacitor C_L.	CO3	7 Marks

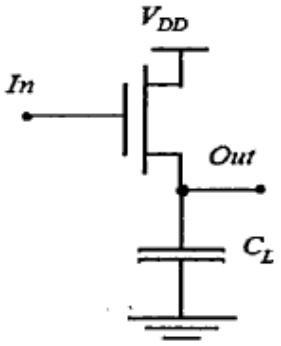


Fig.1

UNIT-II

3	a)	Describe three sources of wiring capacitances. Explain the effect of wiring capacitance on the performance of a VLSI circuit.	CO6	7 Marks
	b)	Design a stick diagram and layout diagram for the CMOS logic shown below Y=((A+B)(C+D))'.	CO4	7 Marks
		(OR)		
4	a)	Develop the layout diagram for three input-NAND and NOR gates using CMOS logic.	CO4	7 Marks
	b)	Explain the concept of sheet resistance and apply it to compute the ON resistance (VDD to GND) of an NMOS inverter having pull up to pull down ratio of 4:1, if n channel resistance is Rsn = 104 per square.	CO6	7 Marks

UNIT-III

5	a)	Enumerate all the 16 possible functions of a two input ALU.	CO2	7 Marks
	b)	Compare the different types of CMOS subsystem Multipliers.	CO2	7 Marks
		(OR)		
6	a)	Compare the different types of Adders.	CO2	7 Marks
	b)	Appraise the use of carry generation and propagation in carry look-ahead adder.	CO5	7 Marks

UNIT-IV

7	a)	Implement an adder cell and register cell using transmission gates and explain.	CO4	7 Marks
	b)	Sketch and compare the schematics of CPLD and FPGA.	CO2	7 Marks
		(OR)		
8	a)	Summarize the purpose of using Programmable Interconnect structures and explain in detail.	CO5	7 Marks
	b)	Design a 4-bit synchronous up/down counters using adders and registers.	CO3	7 Marks

UNIT-V

9	a)	Write short notes on "need for CMOS testing".	CO1	7 Marks
	b)	Explain the basic sources of errors in CMOS Circuit and how they are tested in synthesis process.	CO4	7 Marks
		(OR)		
10	a)	Discuss different low power techniques for SRAM memory cells.	CO1	7 Marks
	b)	Suggest design methodologies for power reduction.	CO4	7 Marks

CODE No.: 16BT51202 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations, November – 2022

OBJECT ORIENTED ANALYSIS AND DESIGN

[Computer Science and Engineering, Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1		Explain about conceptual model of UML.	CO1	14 Marks
		(OR)		
2		Design a class diagram for School information system using structural relationships.	CO4	14 Marks
		UNIT-II		
3	a)	Define a classifier.	CO1	2 Marks
	b)	List and explain standard stereotypes that apply to classes.	CO1	6 Marks
	c)	List and explain different kinds of classifier.	CO1	6 Marks
		(OR)		
4	a)	Differentiate between sample, anonymous, orphan and multi object instances.	CO2	7 Marks
	b)	How can we model object structures? Explain with an example.	CO1	7 Marks
		UNIT-III		
5	a)	Design sequence diagram for Online Shopping.	CO5	8 Marks
	b)	Distinguish sequence diagram from collaboration diagram.	CO2	6 Marks
		(OR)		
6	a)	Design usecase diagram for Hospital Management System Problem statement: Patients request for appointment for any doctor. The details of the existing patients are retrieved by the system. New patients update their details in the system before they request for appointment with the help of assistant. The assistant confirms the appointment based on the availability of free slots for the respective doctors and the patient is informed. Assistant may cancel the appointment at any time.	CO4	9 Marks
	b)	Illustrate the steps involved in modeling the requirements of a system.	CO1	5 Marks
		UNIT-IV		
7	a)	Design state chart diagram for ATM system with sub states.	CO4	8 Marks
	b)	Distinguish sequential states and concurrent states.	CO2	6 Marks
		(OR)		
8	a)	Define an Event.	CO1	3 Marks
	b)	List and explain different kinds of events with an example.	CO1	11 Marks
		UNIT-V		
9	a)	Differentiate between components and classes.	CO2	5 Marks
	b)	List and explain the different kinds of components with an example.	CO1	9 Marks
		(OR)		
10	a)	Explain the relationship between components and interfaces with a suitable example	CO1	7 Marks
	b)	Apply modeling processes and devices techniques to design a client/server system.	CO3	7 Marks

CODE No.: 16BT51203 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations, November - 2022

WEB TECHNOLOGIES
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Design a web page which provides the following details: i) Train Name; ii) Starting Place; iii) Destination; iv) Arrival and Departure time v) Fare Place a border for the table and use cell padding to present the cell data with clarity. Align the table in the center of the screen. Use a caption saying 'Time and Fare List'.	CO6	14 Marks
		(OR)		
2	a)	Design a web page with fields user id, password and a submit button. Consider the following while writing a HTML code. i) Table to include fields. ii) Background image with repeatable option iii) Font Styles and Sizes.	CO5	7 Marks
	b)	Classify different types of CSS. List the advantages of external CSS.	CO2	7 Marks

UNIT-II

3	a)	Design a web page to load a list box dynamically using XMLHttpRequest Object.	CO4	7 Marks
	b)	Develop a web page to perform hiding and showing of HTML elements using JQuery.	CO4	7 Marks
		(OR)		
4	a)	Compare and Contrast AJAX Web Application Model and Classical Web Application Model.	CO2	7 Marks
	b)	Design a webpage with animation effects using JQuery methods.	CO5	7 Marks

UNIT-III

5		Create contact us page using bootstrap responsive classes	CO2	14 Marks
		(OR)		
6		Create a grid system for mobile, tablet and desktop with bootstrap.	CO5	14 Marks

UNIT-IV

7	a)	Define Associative array. Write a code to implement associative array.	CO1	7 Marks
	b)	Explain the following concepts of PHP arrays: i) Merging; ii) Slicing; iii) Splicing	CO1	7 Marks
		(OR)		
8	a)	Classify data types of PHP.	CO2	7 Marks
	b)	Define Type casting. List cast operators of PHP with syntax.	CO1	7 Marks

UNIT-V

9	Develop a PHP code to perform the following with MySQL database: i) Connection Establishment. ii) Query generation for table creation. iii) Retrieving the data from the select query.	CO3	14 Marks
	(OR)		
10	Develop a PHP code for the following: i) Fetching database results into an object. ii) Retrieving database results using indexed and associative arrays.	CO3	14 Marks

CODE No.: 16BT51241 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations, November - 2022

OBJECT ORIENTED PROGRAMMING
[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Explain the steps involved in creating and executing a java program.	CO1	7 Marks
	b)	Design a program to implement Money class. This class should have fields for initializing a rupee and paisa value. The paisa value will be in the range from 0 – 99 with the paisa being the same sign as that of rupees. The class should have all reasonable constructors, addition and subtraction methods, and a main() method that provides a thorough test of all the methods in the class.	CO6	7 Marks
		(OR)		
2	a)	Java compiled and interpreted. Justify.	CO4	5 Marks
	b)	Create a class Rectangle. The class has two attributes, length and width, each of which defaults to 0. It has methods that calculate the perimeter and area of the rectangle. It has set and get methods for both length and width. The set methods should verify that length and width are floating – point numbers larger than 0.0 and less than 20.0.	CO3	9 Marks

UNIT-II

3	a)	Explain **final** keyword with all its usages. Support explanation with a program.	CO1	7 Marks
	b)	Explain the various forms of implementing **interface**s.	CO1	7 Marks
		(OR)		
4	a)	What are Nested Interfaces? Explain with a suitable example.	CO1	7 Marks
	b)	Create a class within the package "`AmountInWords`" to convert the amount into words. (Consider the amount to be not more than 100000.)	CO3	7 Marks

UNIT-III

5	a)	Explain the steps in creating a thread using **Runnable** interface.	CO1	6 Marks
	b)	Design a java program that demonstrates how a high-priority thread using sleep makes way for the lower-priority threads to execute.	CO3	8 Marks
		(OR)		
6	a)	What is a try-with-resources block and how it is used?	CO1	4 Marks
	b)	Consider a Student examination database system that prints the marksheet of students. Input the following from the command line: i) Student's name ii) Marks in six subjects These marks should be between 0 to 100. If the marks are not in the specified range, raise a RangeException, else find the total marks and print the percentage of the student.	CO6	10 Marks

UNIT-IV

7	a)	Design a program that shows a screen sot with an applet running inside the applet viewer. The applet should display your name.	CO5	6 Marks
	b)	Explain the difference between with a suitable example: i) Vector and ArrayList ii) Enumeration and Iterator	CO1	8 Marks

(OR)

8	a)	Explain the use of overriding the following methods for an applet. init() start() stop() destroy() paint()	CO1	6 Marks
	b)	Create a collection class named Queue to implement the FIFO order of queues.	CO3	8 Marks

UNIT-V

9	a)	How is the concept of inner classes used for event handling?	CO2	7 Marks
	b)	What is the difference between doGet () and doPost () or GET and POST?	CO1	7 Marks

(OR)

10	a)	What do you mean by HTTP servlet request and response? What is the procedure for initializing a servlet ?	CO1	7 Marks
	b)	What is the advantage of having anonymous classes while handling events in Java?	CO1	7 Marks

CODE No.: 16BT60402 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations, November - 2022

DIGITAL SIGNAL PROCESSING
[Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	The impulse response of LTI system is $h(n)=\{1,2,1,-1\}$. Find the response of the system to the input $x(n)=\{2,1,0,2\}$.	CO5	7 Marks
	b)	Check whether following system is linear, causal and time invariant. $Y(n)=x(n)x(n-2)$.	CO2	7 Marks
		(OR)		
2	a)	Classify discrete time systems with examples.	CO2	7 Marks
	b)	Derive the relation between the input and output of LTI system.	CO3	7 Marks

UNIT-II

3	a)	Derive and sketch the structure of decimation in time FFT algorithm for N=8.	CO3	8 Marks
	b)	Synthesize the time domain sequence using IDFT of the sequence $X(k)=\{1,\ 1\text{-}2j,\ -1,\ 1+2j\}$.	CO5	6 Marks
		(OR)		
4	a)	Find the 8-Point DFT of the sequence $x(n)=\{1,\ -1,\ -1,\ -1,\ 1,\ 1,\ 1,\ -1\}$ using DIT FFT algorithm.	CO5	7 Marks
	b)	Derive and sketch the structure of Decimation in Frequency FFT algorithm for N=8.	CO3	7 Marks

UNIT-III

5	a)	Apply the bilinear transformation to $H_a(s) = \frac{4}{(s+3)(s+4)}$ with T=0.5s and find $H(z)$.	CO4	7 Marks
	b)	Derive an expression for order of the butterworth analog prototype filter.	CO2	7 Marks
		(OR)		
6	a)	Convert the following analog filter transfer function Bilinear Transformation method. $H(s)=1/(s+0.2)$ Consider T= 1 Sec.	CO4	7 Marks
	b)	Compare the characteristics of butter worth and chebyshev approximations.	CO2	7 Marks

UNIT-IV

7	a)	Synthesize the Direct form realizations of linear phase FIR filter when N is even and odd.	CO4	7 Marks
	b)	Design a linear phase FIR bandstop filter to reject frequencies in the range 0.35π to 0.48π rad/sample by taking 75samples of rectangular window.	CO3	7 Marks
		(OR)		
8	a)	What is gibbs phenomenon? How its effect can be reduced in the design of FIR filters.	CO3	7 Marks
	b)	Derive the frequency response of Linear phase FIR filter when impulse response is symmetric when N even no. samples.	CO2	7 Marks

UNIT-V

9	a)	Explain the internal architecture of TMS320C6X DSP processor.	CO1	7 Marks
	b)	Discuss the modified bus structures and memory access schemes with supporting block diagrams.	CO1	7 Marks

(OR)

10	a)	Explain VLIW architecture with neat block diagram and explain how higher throughput is obtained using VLIW architecture with an Example.	CO1	7 Marks
	b)	Write a short note on i) pipelining; ii) Onchip peripherals.	CO1	7 Marks

CODE No.: 16BT60404 SVEC-16

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Supplementary Examinations, November – 2022

IMAGE PROCESSING
[Information Technology]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I		
1	a)	Draw the Block diagram of Image Processing System and explain each block in detail.	CO1	8 Marks
	b)	Analyze the Performance of Haar Transform with kernel.	CO2	6 Marks
		(OR)		
2	a)	Write the Properties of: i) Slant Transform. ii) KL Transform.	CO1	4 Marks
	b)	Derive the kernel for N = 4 using Discrete Cosine Transform.	CO3	10 Marks
		UNIT-II		
3	a)	How Histogram Equalization is used in Modern Digital image Processing?	CO6	7 Marks
	b)	Apply various techniques in image Sharpening and explain in brief.	CO5	7 Marks
		(OR)		
4	a)	What are the techniques used in image processing to remove blurring in an image?	CO5	7 Marks
	b)	What are the applications of image enhancement in the society?	CO6	7 Marks
		UNIT-III		
5	a)	Write a brief notes on Weiner Filtering.	CO1	7 Marks
	b)	Differentiate between enhancement and restoration processes. Present the restoration technique employing inverse filter.	CO2	7 Marks
		(OR)		
6	a)	Design additive and multiplicative noise models.	CO1	7 Marks
	b)	Briefly explain the approach of inverse filtering method used for image restoration.	CO2	7 Marks
		UNIT-IV		
7	a)	Write notes on image compression standards.	CO1	7 Marks
	b)	Develop an algorithm for 'Huffman coding' to compress an image.	CO3	7 Marks
		(OR)		
8	a)	What is meant by Error-free compression? Discuss about variable-length coding and Token based coding.	CO1	7 Marks
	b)	What is the algorithm used in Arithmetic coding? Explain with an example.	CO3	7 Marks
		UNIT-V		
9	a)	Explain RGB color model using Cartesian coordinate system with supporting diagram.	CO1	7 Marks
	b)	Identify various color models used in the digital representation of a color image.	CO4	7 Marks
		(OR)		
10	a)	Write a short notes on: i) Color models. ii) Color image segmentation.	CO1	8 Marks
	b)	Suggest an operator to perform edge detection in 2-D and explain its significance.	CO4	6 Marks

CODE No.: 19BT4HS08 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations, November – 2022

INDIAN HISTORY

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

	UNIT-I				
1.	Define the term institution and describe major functions of institution that includes different types of marriages.	12 Marks	L1	CO1	PO1
	(OR)				
2.	What are major Varna's in the Indian history (vedic period) and explain roles and responsibilities of the family system?	12 Marks	L2	CO1	PO1
	UNIT-II				
3.	Describe about the Mohenjodaro civilization and period of occurrence.	12 Marks	L1	CO1	PO1
	(OR)				
4.	Analyze the farming and construction of houses of Harappan's with the present constructional features.	12 Marks	L2	CO2	PO2
	UNIT-III				
5.	Explain briefly about the Satavahana dynasty and Sunga dynasty.	12 Marks	L2	CO2	PO1
	(OR)				
6.	Examine the ruling of Vijayanagar kings and the efforts they made to improve the social culture.	12 Marks	L2	CO2	PO6
	UNIT-IV				
7.	Analyze the political situation in India when East India Company entered in 18th Century.	12 Marks	L2	CO2	PO2
	(OR)				
8.	How British east India company stabilized their place in India during 18th century?	12 Marks	L1	CO1	PO1
	UNIT-V				
9.	"Modernization and globalization changed the face of the India". Interpret.	12 Marks	L2	CO2	PO2
	(OR)				
10.	Mention the existing trends of job market and change in technology.	12 Marks	L1	CO1	PO6

CODE No.: 19BT40403 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations, November – 2022

LINEAR AND DIGITAL IC APPLICATIONS

[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Sketch the functional schematic of 555-timer for Astable multivibrator and describe in detail.	6 Marks	L1	CO1	PO1
	b)	Explain the principle of operation of 565 PLL with the help of block diagram.	6 Marks	L1	CO1	PO2
		(OR)				
2.	a)	Analyze the basic principle of operation of RC Phase shift oscillator using op-amp. Derive the condition for frequency of oscillations.	6 Marks	L2	CO1	PO8
	b)	Design a First order Butter worth LPF and plot the Frequency response.	6 Marks	L4	CO2	PO3

UNIT-II

3.	a)	Explain the principle of operation of Flash type ADC.	6 Marks	L1	CO3	PO1
	b)	Compare the operation of a Dual-slope ADC with flash type ADC.	6 Marks	L1	CO3	PO2
		(OR)				
4.	a)	Design a Butterworth high pass filter of order two with cut off frequency of 3 KHz.	6 Marks	L4	CO2	PO8
	b)	Develop a successive approximation ADC and explain its operation in detail.	6 Marks	L2	CO3	PO2

UNIT-III

5.	a)	Write Verilog code for 16-to-1 multiplexer using case statement in dataflow modeling.	6 Marks	L4	CO4	PO1
	b)	Compare the data types in Verilog HDL.	6 Marks	L1	CO4	PO2
		(OR)				
6.	a)	Analyze the performance of case and if statements in Verilog HDL program.	6 Marks	L2	CO4	PO2
	b)	Develop behavioral style Verilog code for the following functions. $F(S) = A \oplus B \oplus C1$ $F(CO) = AB + AC1 + BC1$	6 Marks	L2	CO4	PO1

UNIT-IV

7.	a)	Sketch the IC diagram of the 74 x 999 subtractor and explain its operation.	6 Marks	L1	CO5	PO1
	b)	Write Verilog code in any modeling style and analyze the concept of a simple floating-point encoder.	6 Marks	L2	CO5	PO2
		(OR)				
8.	a)	Explain the concept of 74 x 280 9-Bit Parity Generator with an example.	6 Marks	L2	CO5	PO1
	b)	Design a Barrel Shifter using 74 x 151 multiplexer and write its Verilog HDL code.	6 Marks	L2	CO5	PO2

UNIT-V

9.	a)	Design a 3-bit LFSR counter using 74x194. List out the sequence assuming that the initial state 111.	6 Marks	L3	CO5	PO4
	b)	Explain the operation of standard IC 74x194 and Write Verilog HDL code for 74x194.	6 Marks	L2	CO5	PO6
		(OR)				
10.	a)	Sketch the symbol, functional table and write Verilog HDL source code of 74x194 IC.	6 Marks	L2	CO5	PO6
	b)	Design a modulo-8 binary counter and decoder with glitch-free outputs. Explain the operation.	6 Marks	L4	CO5	PO3

CODE No.: 19BT50103 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations, November – 2022

REINFORCED CEMENT CONCRETE STRUCTURES

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain about working stress method and its importance.	2 Marks	L2	CO1	PO1
	b)	Design the reinforcement required for a doubly reinforced beam having a width of 250mm and effective depth of 500mm and cover to the center of compression reinforcement is 50mm. Maximum bending moment under working load conditions is 160 kNm. Use M20 concrete and Fe 250 steel.	10 Marks	L4	CO1	PO1 PO2 PO4 PO5 PO6 PO10
		(OR)				
2.	a)	What are the provisions to calculate the effective length for a T – Beam and L – Beam?	2 Marks	L2	CO1	PO1
	b)	Design a singly reinforced concrete beam having a clear span of 3m to support a live load of 6 kN/m and width of the beam as 250mm and support width as 230mm. Consider M20 and Fe415 grades. Sketch the reinforcement detailing.	10 Marks	L4	CO1	PO1 PO2 PO4 PO5 PO6 PO8 PO10
		UNIT-II				
3.	a)	Explain the stress strain curve of concrete.	2 Marks	L2	CO2	PO1
	b)	Design a singly reinforced simply supported reinforced concrete beam over a clear span of 4 m with a super imposed load of 20 kN/m having a width of 300mm and support width of 300mm. Consider M 20 and Fe 415 steel with a cover of 50 mm. sketch the details of reinforcement. Check for shear.	10 Marks	L4	CO2	PO1 PO2 PO4 PO5 PO6 PO8 PO10
		(OR)				
4.	a)	Explain the need to check for shear in beams.	2 Marks	L2	CO2	PO1
	b)	Explain about the types of the section with neat sketches.	10 Marks	L4	CO2	PO1 PO2 PO4
		UNIT-III				
5.	a)	Explain about bending moment variations in one way slab and two way slab.	2 Marks	L2	CO3	PO1
	b)	Determine the moment of resistance of a slab for office room of size 4m x 6m subjected to factored load of 8 kN/m² and floor finish load of 1 kN/m². The corners of the slab is prevented from lifting and two adjacent edges are discontinuous. Use M20 and Fe415 grades of concrete and steel.	10 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO6 PO8 PO10
		(OR)				

6.	a)	Calculate the effective depth required for a one-way slab of span 4 m for 0.4% steel of Fe415 grade and M20 Concrete.	2 Marks	L2	CO3	PO1
	b)	Design a simply supported slab supported on masonry walls having a clear span of 3m to bear a live load of 4 kN/m² on a side bearing walls of 120 mm thick. Use M20 and Fe415 grades of concrete and steel and sketch the reinforcement detailing.	10 Marks	L4	CO3	PO1 PO2 PO4 PO5 PO6 PO10
		UNIT-IV				
7.	a)	Explain about clear cover and effective span. Mention the minimum clear cover for beams and columns.	2 Marks	L2	CO4	PO1
	b)	Design a reinforced square column, with following dimensions 400 mm x 400 mm subjected to factored load 2000 KN, factored moment 150Kn/m and with grade of concrete M_{20}, grade of steel Fe-415N/mm². Column surrounded by concrete clear cover 20mm.	10 Marks	L4	CO4	PO1 PO2 PO4 PO6 PO8 PO10
		(OR)				
8.	a)	Explain in detail about the classification of columns based on type of reinforcement and sketch them neatly.	2 Marks	L2	CO4	PO1
	b)	Design a reinforced circular column, with following dimensions i.e, diameter of column 450 mm subjected to factored load 1500KN, factored moment 110 Kn/m and with grade of concrete M 20, grade of steel Fe - 250N/mm². Column surrounded by concrete cover 40 mm (clear cover) and also evaluate hoop and helical reinforcement.	10 Marks	L4	CO4	PO1 PO2 PO4 PO5 PO6 PO8 PO10
		UNIT-V				
9.	a)	Explain in detail about one-way shear in design of footings.	2 Marks	L2	CO5	PO1
	b)	Design an isolated footing for a rectangular column. 230mm x 450mm with 16-20mm diameter longitudinal bars carrying a service load of 2000 kN. Assume safe bearing capacity of soil as 300 kN/m² at a depth of 1 m below ground level. Use M25 concrete and Fe415 steel. Sketch the reinforcement details and check for shear.	10 Marks	L4	CO5	PO1 PO2 PO4 PO5 PO6 PO8 PO10
		(OR)				
10.	a)	Explain about Dog Legged staircase with neat sketch.	2 Marks	L2	CO5	PO1
	b)	Design one of the flights of a dog legged stair case spanning between landing beams using following data. Number of steps in flight = 10, Tread = 300mm, Rise = 150mm Width of landing beams = 300mm, Live load = 5 kN/m² , Floor finish = 1 kN/m², Grade of concrete = M20, Grade of steel = Fe415.	10 Marks	L4	CO5	PO1 PO2 PO4 PO5 PO6 PO8 PO10

❀ ❀ ❀

CODE No.: 19BT50104 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations, November – 2022

TRANSPORTATION ENGINEERING

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	As a highway engineer suggest and write the ideal alignment requirements for a highway.	6 Marks	L4	CO1	PO1 PO2 PO4 PO5 PO6 PO7
	b)	Design the length of the transition curve and shift using the following data; Design speed= 70 kmph Radius of circular curve= 220 m Allowable rate of super elevation= 1 in 150 Pavement rotated about inner edge of the pavement Pavement width including extra widening= 7.5 m	6 Marks	L6	CO2	PO1 PO2 PO3 PO4 PO8
		(OR)				
2.	a)	Explain in detail about the different road pattern with neat sketches.	6 Marks	L2	CO1	PO1 PO10
	b)	Design the extra widening required for a pavement of width 7m on a horizontal curve of radius 250 m if the longest wheel base of vehicle expected on the road is 7.0 m. Design speed is 70 kmph.	6 Marks	L6	CO2	PO1 PO2 PO3 PO4 PO8

UNIT-II

3.	a)	A two lane road at present carrying traffic of 1200 CVPD. It is to be strengthen for growing traffic needs, VDF=2.75, rate of growth of traffic 7.5% annum, period of construction is 5 years. The pavement is to be designed for a life of 15 years after completion. Calculate the cumulative standard axles used for design.	6 Marks	L6	CO3	PO1 PO2 PO3 PO5 PO8
	b)	Write a short note on Aggregate Crushing test and its significance.	6 Marks	L2	CO1	PO1 PO5 PO8
		(OR)				
4.	a)	Write a short note on Softening Point test on bitumen and its significance.	6 Marks	L2	CO1	PO1 PO5 PO8
	b)	Calculate the stress at interior, edge and corner regions of a cement concrete pavement using Westergaard's equation. Use the following data. Wheel load, P=5000kg; Modulus of elasticity of concrete, $E=3.0x10^5$ kg/cm^2; Pavement thickness, h=20 cm, Poisson's ratio=0.15; Modulus of subgrade reaction=6.0 kg/cm^3; Radius of contact area=15 cm.	6 Marks	L4	CO3	PO1 PO2 PO8

UNIT-III

5.	a)	What is the need of Origin and Destinations studies discuss briefly.	6 Marks	L4	CO4	PO1 PO2
	b)	Discuss the relationship between speed, density and flow with neat sketches.	6 Marks	L4	CO4	PO1 PO2 PO10
		(OR)				
6.	a)	For designing a two phase fixed signal at an intersection having N-S and E-W roads where only a straight ahead traffic is permitted. The lost time per cycle is 11 sec. The average normal flow of traffic on N-S and E-W during design period are 1100 PCU per hour and 800 PCU per hour respectively. The saturation flow values are 2400 PCU per hour and 2900 PCU per hour for N-S and E-W roads respectively. Calculate the optimum cycle length (sec) as per Webster's approach.	6 Marks	L4	CO4	PO1 PO2 PO4 PO5 PO6
	b)	Briefly discuss the traffic volume data collection methods and list out latest trends in traffic volume data collection.	6 Marks	L4	CO4	PO1 PO2 PO12

UNIT-IV

7.	a)	Discuss briefly about Points and Crossings.	6 Marks	L4	CO5	PO1 PO2
	b)	A turnout takes off as a 5º curve with contrary flexure from a BG main line on a 3º curve. The speed on the branch line is restricted to 50 km/hr. Determine the maximum permissible speed on the main line.	6 Marks	L4	CO5	PO1 PO2 PO4
		(OR)				
8.	a)	Discuss railway development in Indian Scenario.	6 Marks	L2	CO5	PO1
	b)	Determine the equilibrium speed for which super elevation is to be maintained for the following split-up of the trains and their speeds in the section: 14 trains at 55 km/h 5 trains at 62 km/h 5 trains at 85 km/h 2 trains at 92 km/h The track is on BG and the main line curve is a 2º curve. Determine the super elevation to be provided allowing cant deficiency of 75 mm, and the speed for this section.	6 Marks	L4	CO5	PO1 PO2 PO4

UNIT-V

9.	a)	Write a short note on Aircraft characteristics.	6 Marks	L2	CO6	PO1 PO6 PO7 PO8
	b)	The monthly average of the maximum daily temperature at the proposed site of an airport is 47º C during the hottest month of the year. During the same month, the average daily temperature is 36º C. Calculate the airport reference temperature. If the site is at MSL and is having an effective gradient of 0.6%. Calculate the actual length to be provided, if basic runway length is 2245 m.	6 Marks	L4	CO6	PO1 PO2 PO4 PO8
		(OR)				
10.	a)	Compare and contrast VASI and PAPI system with neat sketches.	6 Marks	L4	CO6	PO1 PO2 PO8 PO10
	b)	Write down the steps involved in drawing Type-II Wind rose diagram along with explaining wind coverage, cross wind and calm period briefly.	6 Marks	L2	CO6	PO1 PO8

CODE No.: 19BT50105 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations, November – 2022

CONSTRUCTION EQUIPMENT AND AUTOMATION

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	What is equipment maintenance? List the objectives of maintenance.	6 Marks	L2	CO1	PO1 PO3
	b)	A excavator is purchased in the year 12 may, 2000 with a cost of Rs. 32,00,000/- which the company assured its service period as 20years.the scrap value of the equipment is Rs. 25000/- find the depreciation value for each and year using diminishing method. Also, find the rate of depreciation.	6 Marks	L4	CO1	PO1 PO2 PO5 PO10
		(OR)				
2.	a)	List the steps to improve equipment's productivity.	4 Marks	L2	CO1	PO1 PO5
	b)	A lathe machine is purchased for Rs. 84,000/- and the assumed life is 10years and scrap value is Rs. 20,000/-. If the depreciation is charged by diminishing balance method, calculate the percentage by which, value of the lathe is reduced every year and depreciation fund after 2years and also find out the cost of the lathe machine for each year.	8 Marks	L3	C01	PO1 PO2 PO5 PO10

UNIT-II

3.	a)	What are basic earthwork operations? Suggest a multipurpose equipment to perform different earthwork operations.	6 Marks	L4	CO2	PO1 PO2 PO5 PO6
	b)	Explain densification of soil with neat sketch.	6 Marks	L2	CO2	PO1 PO5 PO10
		(OR)				
4.	a)	Enlist different soil compaction principles.	6 Marks	L2	CO2	PO1 PO5
	b)	What is dump truck? How will you calculate the number of dump trucks required for a project?	6 Marks	L4	CO2	PO1 PO2 PO5 PO6

UNIT-III

5.	a)	How will you enhance the production capacity of: i) Jaw crushers. ii) Hammer mills. iii) Screening plants. iv) Crushing plants	6 Marks	L4	CO3	PO1 PO2 PO4 PO5
	b)	Explain the method of tunneling by "drill and blast".	6 Marks	L2	CO3	PO1 PO5 PO6

(OR)

6.	a)	Write the uses of Ready Mix Concrete (RMC).	6 Marks	L2	CO3	PO1 PO5
	b)	Compare and contrast the following : i) Multi-stage pump ii) Submersible pump iii) Deep well pump	6 Marks	L4	CO3	PO1 PO2 PO5

UNIT-IV

7.	a)	Explain the stages of project planning.	6 Marks	L2	CO4	PO1 PO11
	b)	In which aspects the BIM is useful? Explain in detail.	6 Marks	L4	CO4	PO1 PO2 PO5 PO10 PO11

(OR)

8.	a)	How do building automation system work? Explain with neat sketch.	6 Marks	L2	CO4	PO1 PO5 PO10 PO11
	b)	What sort of barriers would a engineer face while implementing BIM?	6 Marks	L4	CO4	PO1 PO2 PO5 PO10 PO11 PO12

UNIT-V

9.	a)	Define a robot. Illustrate different types of robots.	6 Marks	L2	CO5	PO1 PO5 PO11
	b)	Write the advancement in surveying using autonomous machines and explain how drone survey helps in surveying the areas with ease.	6 Marks	L4	CO5	PO1 PO2 PO5 PO11

(OR)

10.	a)	What steps would you like to take for starting the use of your own drone in construction project?	6 Marks	L4	CO5	PO1 PO2 PO5 PO11 PO12
	b)	Discuss the use of robots in pre-fabrication works for housing projects.	6 Marks	L4	CO5	PO1 PO2 PO5 PO11

CODE No.: 19BT50302 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations, November - 2022

OPERATIONS RESEARCH
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. Solve following Linear Programming problem using Simplex method. — 12 Marks | L3 | CO1 | PO1 PO2

$Maximize\, Z = X_1 + X_2 + X_3$

$Subject\, to\ 4X_1 = 5X_2 + 3X_3 \leq 15$

$10X_1 + 7X_2 + X_3 \leq 12$

$and\ X_1, X_2, X_3 \geq 0$

(OR)

2. Use two-phase method to solve the following Linear Programming Problem. — 12 Marks | L3 | CO1 | PO1 PO2

$Maximize\ Z = 3X_1 - X_2$

$Subject\, to\ 2X_1 = X_2 \geq 2$

$X_1 + 3X_2 \leq 2$

$X_2 \leq 4$

$and\ X_1, X_2 \geq 0$

UNIT-II

3. Goods have to be transported from sources S_1, S_2 and S_3 to destination D_1, D_2 and D_3. The transportation cost per unit, capacities of the sources, and the requirements of the destinations are given in the following table. — 12 Marks | L3 | CO1 | PO1 PO2

	D_1	D_2	D_3	Supply
S_1	8	5	6	120
S_2	15	10	12	80
S_3	3	9	10	80
Demand	150	80	50	

Determine a transportation schedule so that cost is minimized. Use North-west corner rule to find Basic Feasible Solution.

(OR)

4. A travelling salesman has to visit 5 cities. He wishes to start from a particular city, visit each city once and then return to his starting point. The travelling cost (in '000 Rs) of each city from a particular city is given below: — 12 Marks | L3 | CO1 | PO1 PO2

		To city				
		A	B	C	D	E
From city	A	-	2	5	7	1
	B	6	-	3	8	2
	C	8	7	-	4	7
	D	12	4	6	-	5
	E	1	3	2	8	-

What should be the sequence of visit of the salesman so that the cost is minimum?

UNIT-III

5. a) Explain i) Pure strategy in a game ii) Row dominance in game problem iii) Column dominance in game problem. — 4 Marks | L1 | CO2 | PO1

b) Solve the game whose payoff matrix is given below: — 8 Marks | L3 | CO2 | PO1 PO2

Player B

Player A	B_1	B_2	B_3	B_4
A_1	3	2	4	0
A_2	3	4	2	4
A_3	4	2	4	0
A_4	0	4	0	8

(OR)

6. Find the optimal order quantity of a product for which the price breaks are as follows: — 12 Marks | L3 | CO3 | PO1 PO2

Quantity (Units)	Price per Unit (Rs)
$0 < Q_1 < 100$	20
$100 \leq Q_2 < 200$	18
$200 \leq Q_3$	16

The monthly demand of the product is 400 units. The storage cost is 20 % of the unit cost and the cost of ordering is Rs 25.

UNIT-IV

7. The following table gives the activities of construction project and duration: — 12 Marks | L3 | CO4 | PO1 PO2 PO3

Activity	1-2	2-3	2-4	3-5	3-6	4-6	4-7	5-8	6-8	7-8
Duration (days)	2	3	5	4	1	6	2	8	7	4

Draw the network for the project .Find the critical path and project duration.

(OR)

8. A small project involves 7 activities and their estimates are listed in the following table. — 12 Marks | L3 | CO4 | PO1 PO2 PO3

Activity	Duration (Weeks)		
	Optimistic	Most likely	Pessimistic
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

i) Draw the network of the activities

ii) Find expected duration, variance for each activity and expected Project Length.

iii) What is the probability that the project will be completed at least 4 weeks earlier than expected. time.

UNIT-V

9. Trucks arrive at a loading dock at an average rate of 4 trucks per hour. The loading of a truck takes 10 minutes on the average by a crew of three men. The operating cost of a truck is Rs 20 per — 12 Marks | L3 | CO5 | PO1 PO2 PO3

hour and the men are paid at Rs 6 each per hour. Is it advisable to add another crew of three men?

(OR)

10. A company trading in motor vehicle spare parts wishes to determine the levels of stock it should carry for the items in the range. The demand is not certain and there is a lead time for stock replenishment. For an item A, the following information is obtained: 12 Marks L4 CO5 PO1 PO2 PO3

Demand (units/day)	3	4	5	6	7
Probability	0.10	0.20	0.30	0.30	0.10

Carrying cost (per unit/day) =Rs 2, Ordering cost (per order) = Rs 50, lead time for replenishment = 3 days. Stock on hand at the beginning of the simulation exercise was 20 units. Carry out a simulation run over a period of 10 days with the objective of evaluating the inventory rule: Order 15 units when present inventory falls below 15 units. Use random numbers in the sequence: 0, 9, 1, 1, 5, 1, 8, 6, 3, 5. Also calculate total inventory cost.

CODE No.: 19BT50303 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations, November – 2022

THERMAL ENGINEERING-II

[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Differentiate Benson boiler and locomotive boiler.	6 Marks	L2	CO1	PO1
	b)	Calculate the equivalent evaporation from and at 1000C for a boiler, which receives water at 600C and produces steam at 1.5MPa and 3000C. The steam generation rate is 16000kg/h. Coal is burnt at the rate of 1800 kg/h. The calorific value of coal is 34750 kJ/kg. Also evaluate the thermal efficiency of the boiler. If the efficiency of the boiler is increased by 5% due to use of economiser, find the saving in coal consumption per hour	6 Marks	L3	CO1	PO1
		(OR)				
2.	a)	Differentiate between water tube and fire tube boilers.	6 Marks	L2	CO1	PO1
	b)	Discuss the working principle of Babcock and Wilcox boiler with a neat sketch.	6 Marks	L3	CO1	PO1
		UNIT-II				
3.	a)	What are the effects of super saturated flow on the performance of nozzle?	6 Marks	L2	CO2	PO1 PO2 PO3
	b)	Derive the expressions for maximum velocity and discharge through a convergent-divergent nozzle in terms of initial pressure, specific volume and polytropic index.	6 Marks	L3	CO2	PO1
		(OR)				
4.	a)	Draw the schematic diagram of counter flow jet condenser and explain its working.	6 Marks	L2	CO2	PO1 PO2 PO3
	b)	The surface condenser is designed to handle 16000kg of steam per hour. The steam enters the condenser at 0.09 bar abs. and 0.88 dryness fraction and condensate leaves the condenser at the corresponding saturation temperature. Determine the rise in cooling water temperature if the cooling water flow rate is 8.96 x 105 kg/hour. Assume that the pressure is constant throughout the condenser.	6 Marks	L3	CO2	PO1
		UNIT-III				
5.	a)	Derive an expression for maximum blade efficiency.	6 Marks	L2	CO3	PO1 PO2 PO3
	b)	The following data refer to a particular stage of a Parson's reaction turbine Speed of the turbine = 1500 r.p.m, Mean diameter of the rotor = 1 metre, Stage efficiency = 80%, Speed ratio = 0.7, Blade outlet angle = 200. Determine the available isentropic enthalpy drop in the stage.	6 Marks	L3	CO3	PO1
		(OR)				

6.	a)	What is 50%Reaction turbine. What are the characteristics of 50% reaction turbine.	6 Marks	L2	CO3	PO1 PO2 PO3
	b)	Draw and analyze velocity diagram for De-laval turbine.	6 Marks	L3	CO3	PO1 PO2 PO3

UNIT-IV

7.	a)	An ammonia VCR refrigerator operates between -15ºC to 40ºC. The vapor is dry and saturated at the entry to the compressor and compression is isentropic. Assuming there is 5ºC of under cooling, calculate: i) Mass flow rate and power input per kW of refrigeration. ii) COP of the system.	6 Marks	L2	CO4	PO1
	b)	Discuss the working principle of air refrigeration system with a neat diagram.	6 Marks	L3	CO4	PO1 PO2 PO3
		(OR)				
8.	a)	Explain how the COP of vapor compression refrigeration system varies with the following parameters i) Suction pressure. ii) Deliver pressure. iii) Sub-cooling of the refrigerant. iv) Superheating of the refrigerant.	6 Marks	L2	CO4	PO1
	b)	Discuss the difference between heat pump, refrigerator and heat engine with a neat sketch.	6 Marks	L3	CO4	PO1

UNIT-V

9.	a)	Can you explain how the following Psychometric processes can be achieved? Show them on Psychometric chart also. i) Cooling and dehumidification. ii) Heating and humidification.	6 Marks	L2	CO5	PO1
	b)	20 m^3 of air per minute at 30^{0}C and 60% RH are cooled to 22^{0}C DBT maintaining specific humidity constant. Find the following: i) Heat removed from air. ii) RH of cooled air. iii) WBT of the cooled air. Take air pressure = 1 bar.	6 Marks	L3	CO5	PO1 PO2 PO3
		(OR)				
10.	a)	Discuss the constructional details of psychometric chart.	6 Marks	L2	CO5	PO1
	b)	Calculate the properties of moist air whose DBT is 25^{0}C and WBT 15^{0}C.	6 Marks	L3	CO5	PO1

❀ ❀ ❀

CODE No.: 19BT50401 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations, November – 2022

DIGITAL COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Derive an expression for Signal to Quantization noise in a DM System.	6 Marks	L3	CO1	PO2
	b)	What is Companding and explain different types of Companding techniques?	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Find the optimum step size required to avoid slope overload distortion when an analog signal $x(t)=10\sin(2\varpi x10^3t)$is sampled at thrice of Nyquist rate in a Delta Modulator.	6 Marks	L2	CO1	PO1
	b)	Explain the operation of Differential Pulse code modulator and demodulator.	6 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Explain Nyquist's criterion for distortion less transmission of base band signals.	6 Marks	L2	CO2	PO1
	b)	Explain in detail about Inter symbol Interference and Eye Pattern.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	What is a Baseband binary PAM system? Explain.	6 Marks	L2	CO2	PO1
	b)	Explain in detail about Duo binary coding and decoding.	6 Marks	L2	CO2	PO1
		UNIT-III				
5.	a)	Derive the expression for the probability of error in Coherent PSK.	6 Marks	L3	CO2	PO2
	b)	Illustrate the merits of DPSK over BPSK.	6 Marks	L3	CO2	PO2
		(OR)				
6.	a)	Implement a Digital System for generation and reception of DPSK signals with a neat block diagram.	6 Marks	L2	CO2	PO3
	b)	Distinguish between ASK, FSK and PSK systems.	6 Marks	L3	CO2	PO2
		UNIT-IV				
7.	a)	A discrete message source is generating the message sequence [X] = [A B C D E F G H] with probabilities [P] = [0.50, 0.15, 0.15, 0.08, 0.08, 0.02, 0.01, 0.01]. Find the Code words using Huffman coding.	6 Marks	L2	CO3	PO4
	b)	Define mutual information and explain the properties of mutual information.	6 Marks	L2	CO3	PO2

(OR)

8.	a)	Apply the Shanon-Fano coding procedure for the following message ensemble to find the code word:	6 Marks	L2	CO3	PO4
			Signal	X1	X2	X3	X4	X5
			Probability	0.30	0.25	0.20	0.15	0.1
	b)	Define the following: i) Channel Capacity of Continuous Channel. ii) Hartley Shannon's theorem.	6 Marks	L1	CO3	PO1

UNIT-V

9.	a)	Briefly describe about the Code tree, Trellis and State Diagram for a Convolution Encoder.	6 Marks	L3	CO4	PO1
	b)	Discuss about the matrix description of linear block codes.	6 Marks	L3	CO4	PO2

(OR)

10.	a)	Explain Convolution Decoding using Viterbi algorithm.	6 Marks	L2	CO4	PO2
	b)	Find (7,4) cyclic codeword generated in Systematic and Non-systematic form when message data D(1011), D(0101) is applied to Cyclic Encoder with generator polynomial of **a** is $g(x) = 1 + X + X^3$.	6 Marks	L3	CO4	PO3

CODE No.: 19BT50402 SVEC-19

Roll No. | | | | | | | | | | |

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-19) Supplementary Examinations, November - 2022

DIGITAL SIGNAL PROCESSING

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	The system is represented by the difference equation y(n) = x(n+1) + 3x(n) + 5x(n-1) .Is the system causal, stable, and time invariant? Justify your answer.	8 Marks	L3	CO1	PO2
	b)	Determine the z-transform the signal $x(n) = (-1)^n \cos\left(\frac{n\pi}{3}\right)u(n)$.	4 Marks	L3	CO1	PO4
		(OR)				
2.		Determine the solution of the difference equation $y(n) = x(n) + \frac{5}{6}y(n-1) - \frac{1}{6}y(n-2)$ *for* $x(n) = 2^n u(n)$.	12 Marks	L3	CO1	PO4

UNIT-II

3.	a)	State and prove circular time reversal and convolution properties of Discrete Fourier Transform.	6 Marks	L2	CO2	PO2
	b)	Explain the process of evaluating DFT through DITFFT algorithm.	6 Marks	L3	CO2	PO2
		(OR)				
4.		Compute 8-point DFT for the sequence. $x(n) = \begin{Bmatrix} 2, 0 \le n \le 7 \\ 0, otherwise \end{Bmatrix}$ radix-2 DITFFT algorithm.	12 Marks	L3	CO2	PO5

UNIT-III

5.	a)	Compare the characteristics of Butterworth and Chebyshev approximations.	4 Marks	L2	CO3	PO2
	b)	Design a Digital Chebyshev Type-I Low pass filter using bilinear transformation with the specifications. α_p=1 dB ripple in the pass band $0 \le \omega \le 0.2\pi$. α_s=15 dB ripple in the stop band $0.3\pi \le \omega \le \pi$.	8 Marks	L4	CO3	PO3
		(OR)				
6.	a)	Construct the Cascade form structure of the LTI system having $H(z) = \frac{\left(1+\frac{3}{2}z^{-1}+\frac{1}{2}z^{-2}\right)\left(1+\frac{3}{2}z^{-1}+z^{-2}\right)}{\left(1+z^{-1}+\frac{1}{4}z^{-2}\right)\left(1+\frac{1}{4}z^{-1}+\frac{1}{2}z^{-2}\right)}$.	7 Marks	L3	CO3	PO5
	b)	Derive an expression for order of the butter worth analog prototype filter.	5 Marks	L3	CO3	PO2

UNIT-IV

7.	a)	Design FIR high pass filter with a frequency response using hamming window for N = 7. $H_d(e^{j\omega}) = 1$; $\pi/4 \leq \lvert \omega \rvert \leq \pi$ $= 0$; otherwise	7 Marks	L4	CO3	PO3
	b)	Distinguish the window functions used in the design of FIR filters.	5 Marks	L2	CO3	PO2
		(OR)				
8.	a)	Determine the direct form realization of FIR filter having transfer function. $H(z) = 1 + 2z^{-1} - 2z^{-2} + 3z^{-3} + 3z^{-4} - z^{-5} + 2z^{-6} + z^{-7}$	7 Marks	L4	CO3	PO5
	b)	Discuss the advantages and disadvantages of FIR and IIR filters.	5 Marks	L2	CO3	PO1
		UNIT-V				
9.	a)	Explain the internal architecture of TMS320C6X DSP processor.	7 Marks	L2	CO4	PO1
	b)	List the relative merits and demerits of RISC and CISC processors.	5 Marks	L2	CO4	PO1
		(OR)				
10.	a)	Explain Serial port and TDM serial port on-chip peripherals of P-DSPs.	6 Marks	L2	CO4	PO1
	b)	Write a short note on Memory Access schemes in P-DSPs	6 Marks	L2	CO4	PO1