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.

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

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

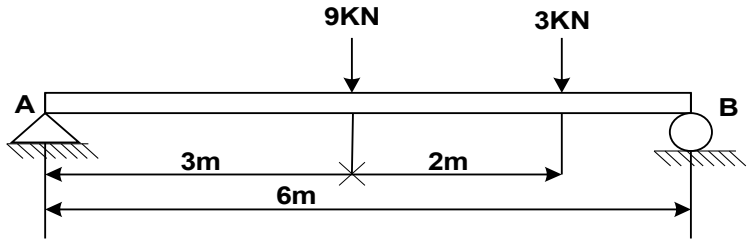
ENGINEERING MECHANICS
[Civil Engineering, Mechanical Engineering]

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

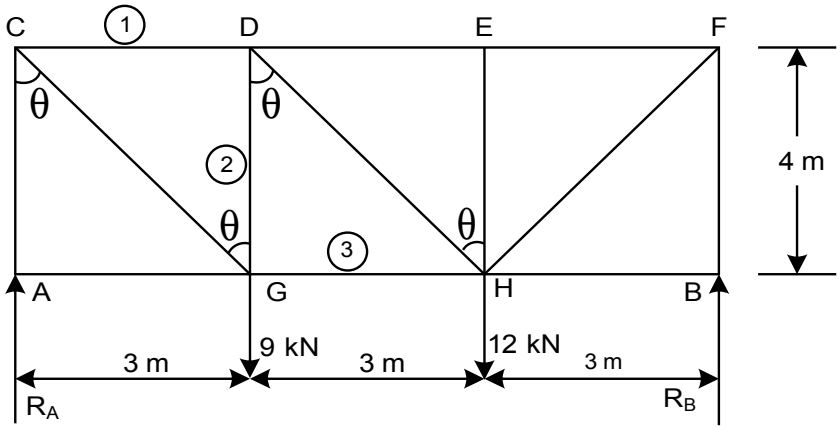
3 a) Differentiate between a roller support and a hinged support. 4 Marks

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

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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

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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

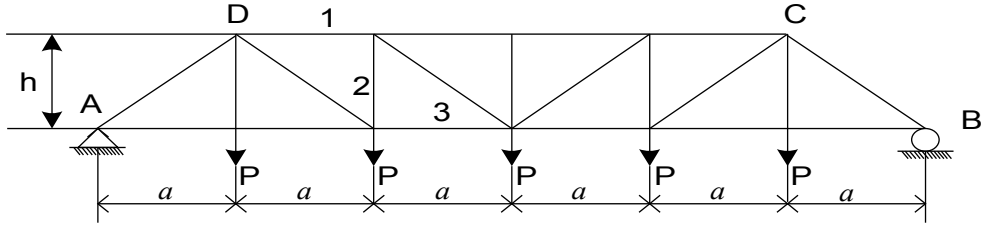
b) A screw jack has square threads of mean diameter 6cm, helix angle 10^0 and coefficient of friction 0.3. Determine the force that must be applied to the end of 60cm lever to raise a weight of 3000N. 10 Marks

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.: 16BT1BS01 SVEC-16

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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: 6 Marks

i) Reverberation. ii) Reverberation time.
iii) Echelon effect. iv) Absorption coefficient.

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

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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

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CODE No.: 16BT1BS04 SVEC-16

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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CODE No.: 16BT10201 SVEC-16

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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

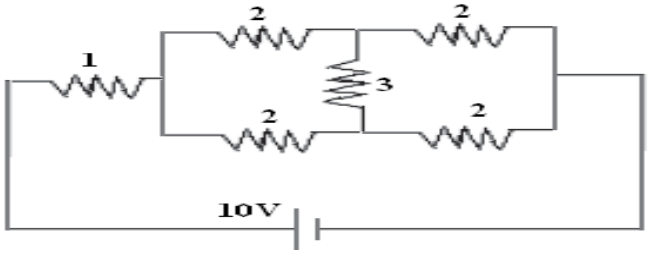


Fig. 1

(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

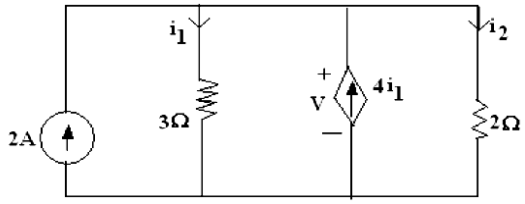


Fig. 2

UNIT-II

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

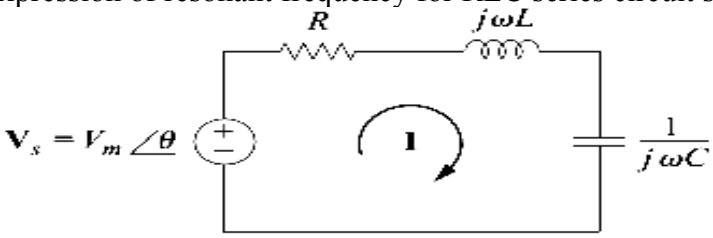


Fig. 3

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.

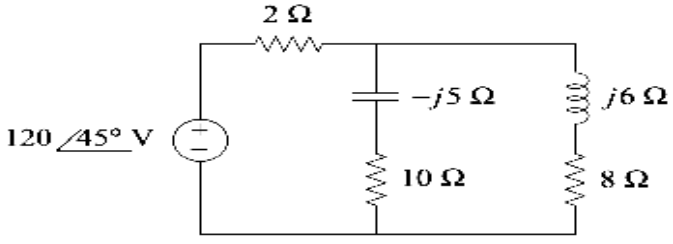


Fig. 4

(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

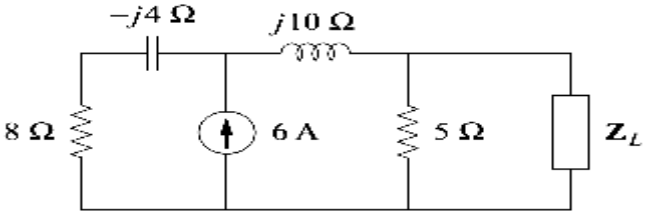


Fig. 5

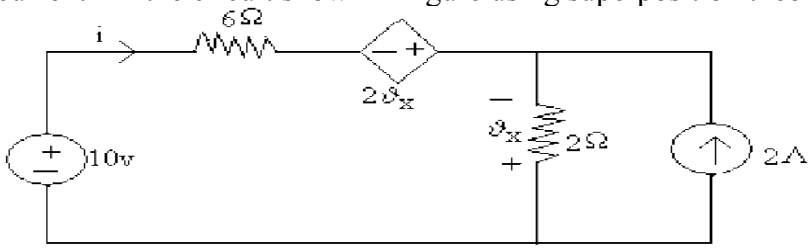
UNIT-III

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

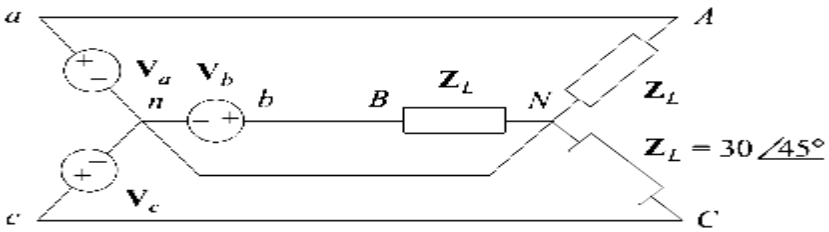


Fig. 6

(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

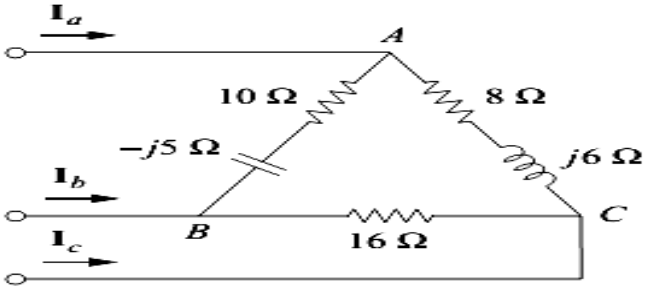


Fig. 7

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

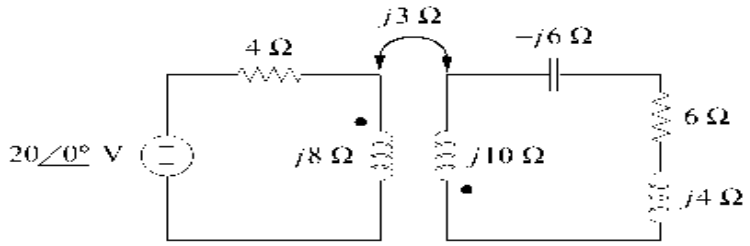


Fig. 8

(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

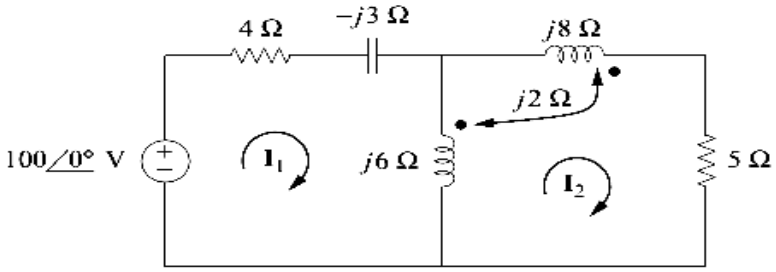


Fig. 9

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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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

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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

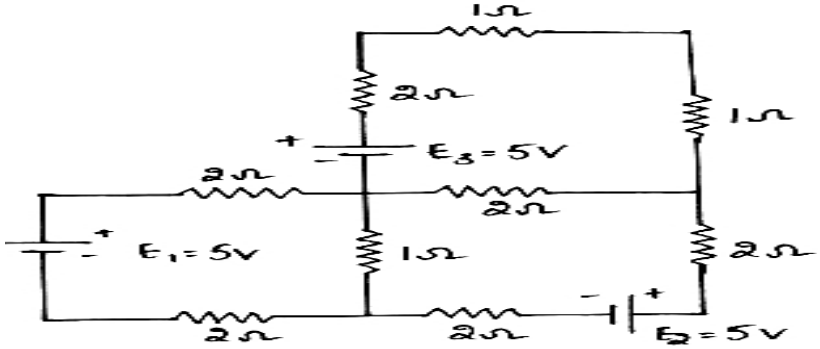


Fig. 1

(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

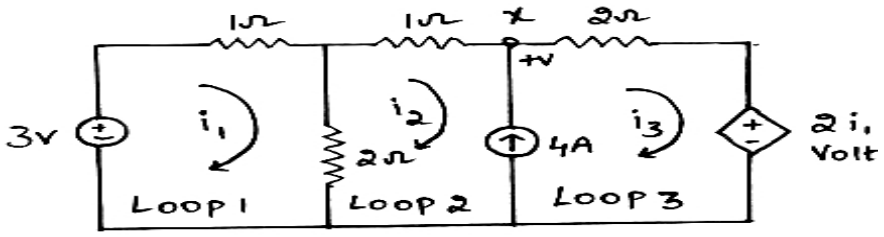


Fig. 2

UNIT-II

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

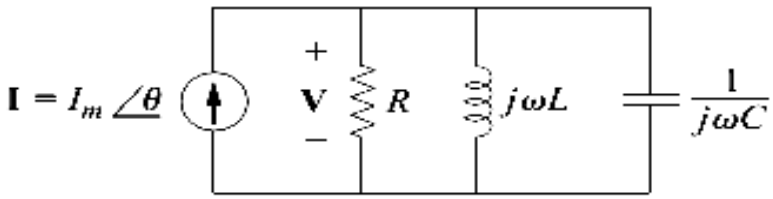


Fig. 3

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

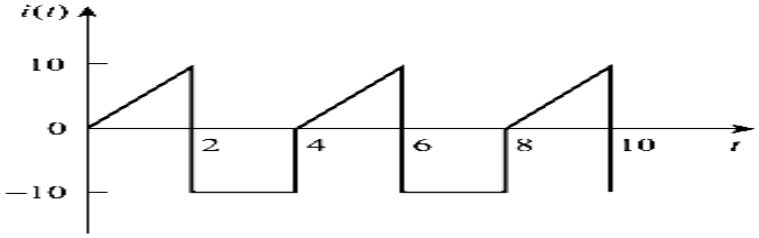


Fig. 4

(OR)

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

RCL series circuit shown in Fig. 5

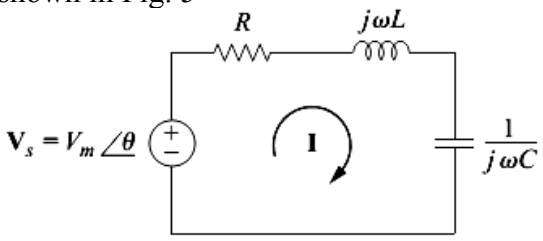


Fig. 5

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

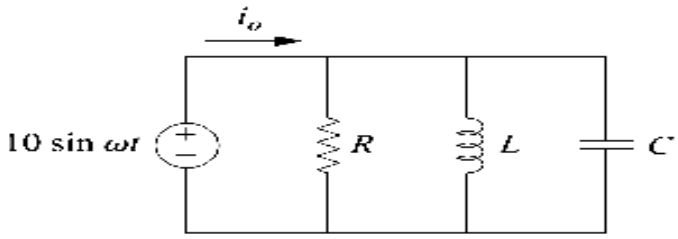


Fig. 6

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

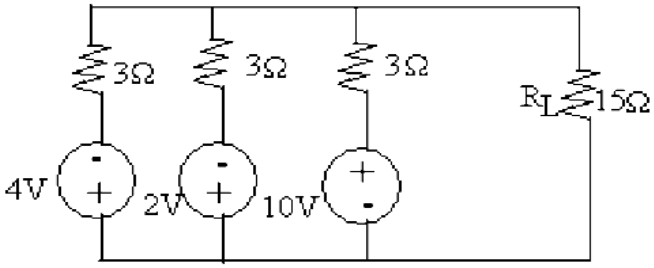
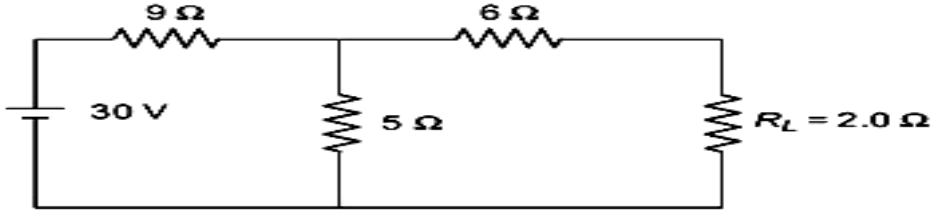


Fig. 7

(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

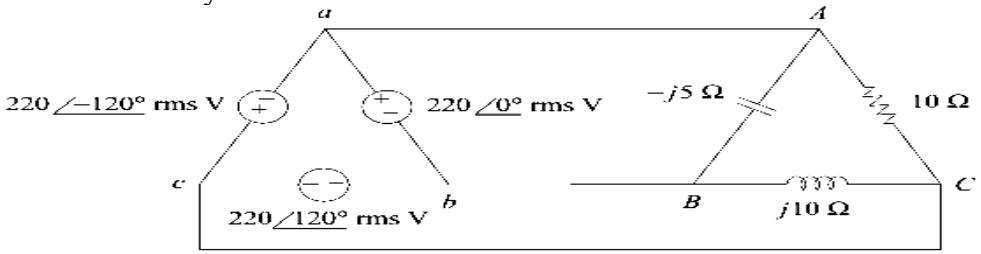


Fig. 8

(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

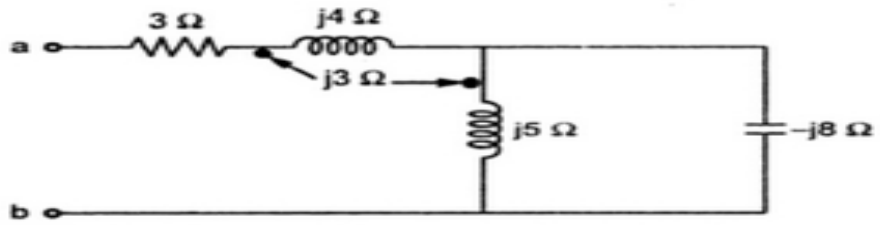


Fig. 9

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

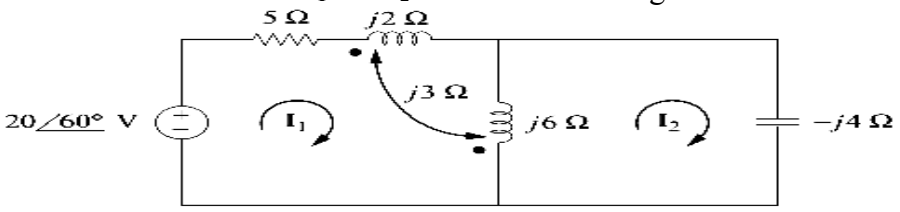


Fig. 10

(OR)

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

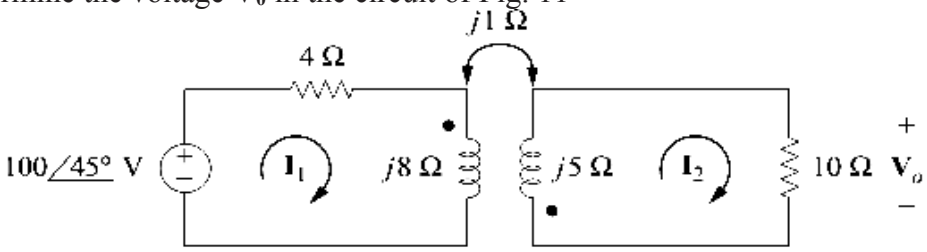


Fig. 11

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

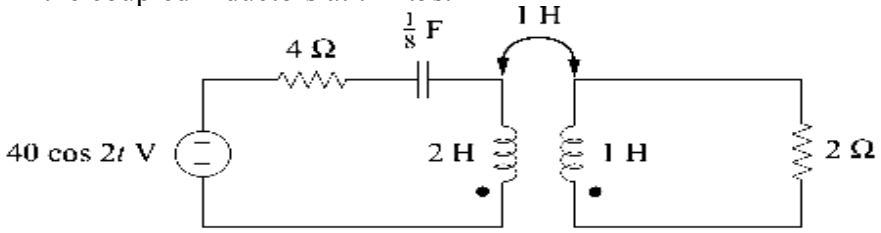


Fig. 12

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

NETWORK ANALYSIS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

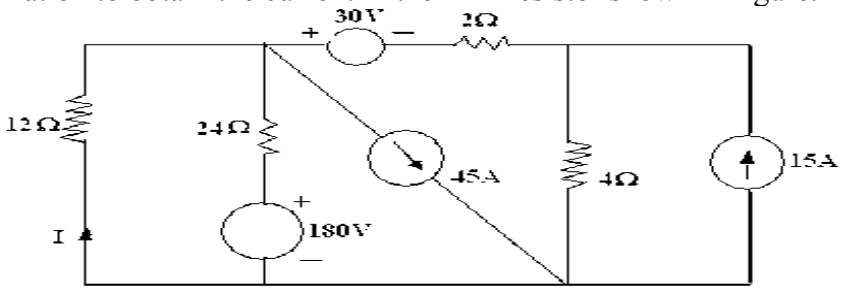
Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

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

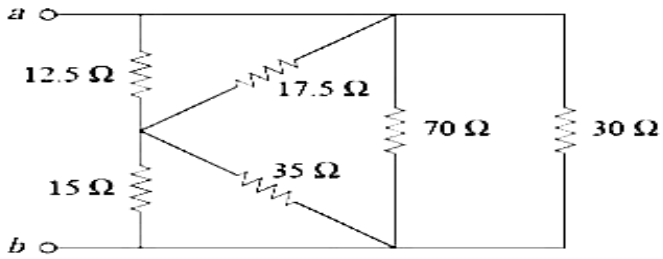
b) Reduce the network to a single loop network by successive source transformation to obtain the current in the 12 Ωresistor shown in figure. 7 Marks



(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

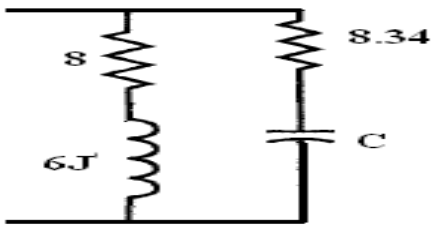
3 a) Explain the concept of active, reactive and apparent power and draw the power triangle. 7 Marks

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)

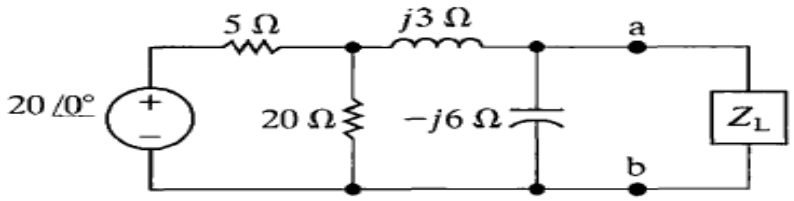
4 a) Define cut-off frequencies and bandwidth. Derive the expressions for cut-off frequencies and bandwidth of series RLC circuit. 7 Marks

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



UNIT-III

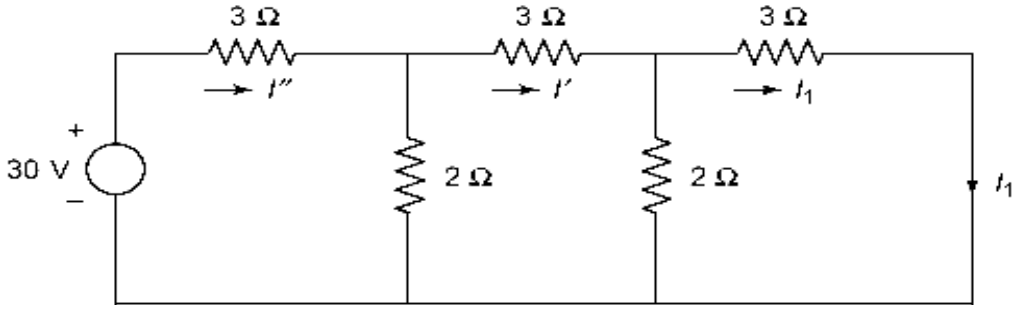
5 For the circuit shown in figure, determine the impedance Z_L that results in maximum average power transfer to Z_L. Also find the maximum power transferred. 14 Marks



(OR)

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

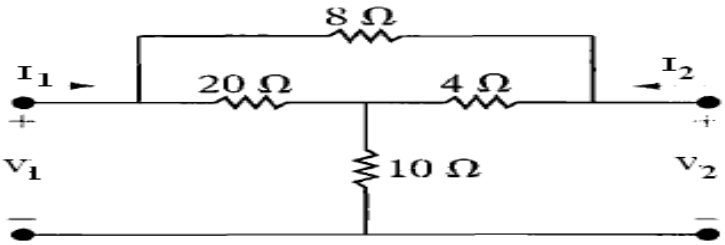
b) Verify reciprocity theorem for the circuit shown in below figure. 7 Marks



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)

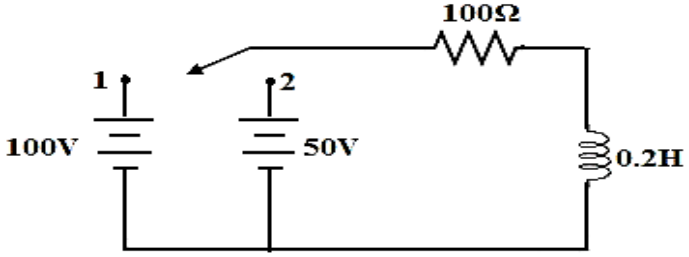
8 a) Define reciprocity and symmetry for a generalized two port network and derive the conditions for reciprocity and symmetry in terms of ABCD parameters. 7 Marks

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

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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

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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

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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, $\lambda = 5860A^0$. 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

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CODE No.: 19BT1BS04 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-19) Supplementary Examinations February - 2021

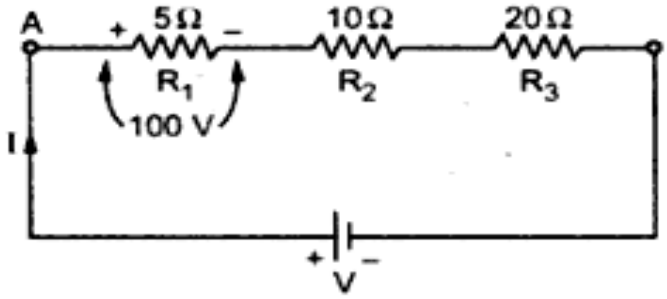
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

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

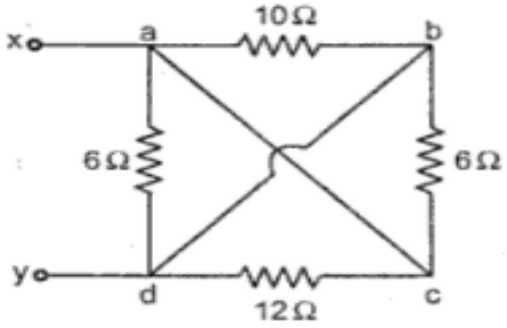
Time: 3 hours **Max. Marks: 60**

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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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 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)	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 Science)]

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 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)	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

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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

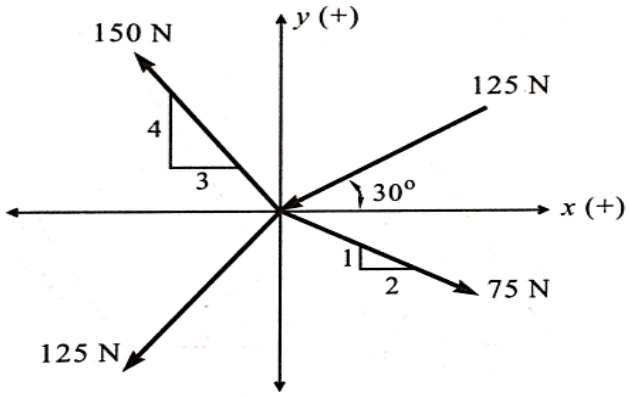


Fig.1

	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

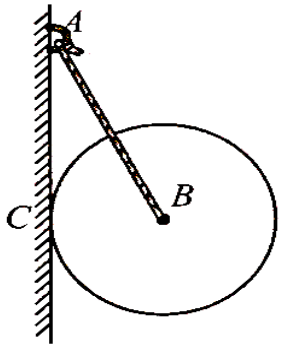


Fig.2

(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

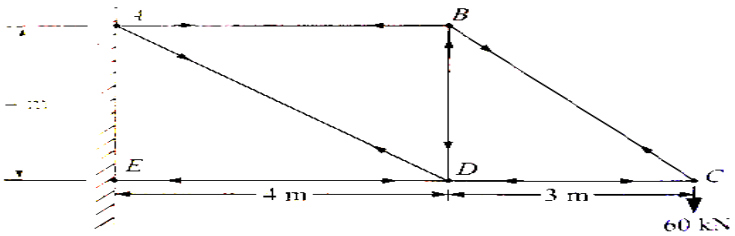


Fig.3

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

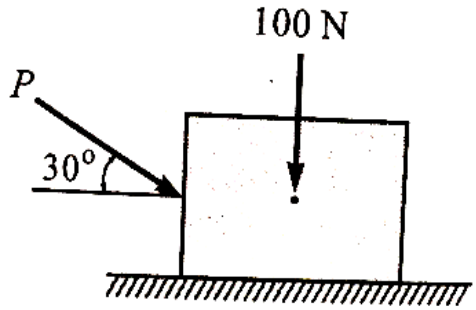


Fig.4

(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

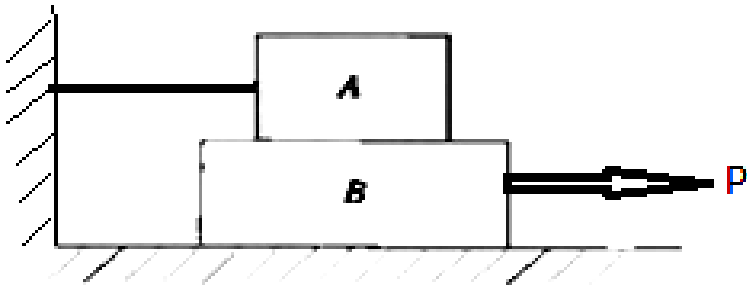


Fig.5

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

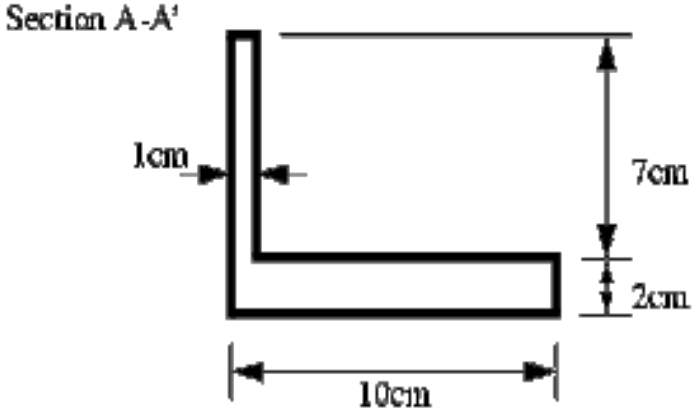
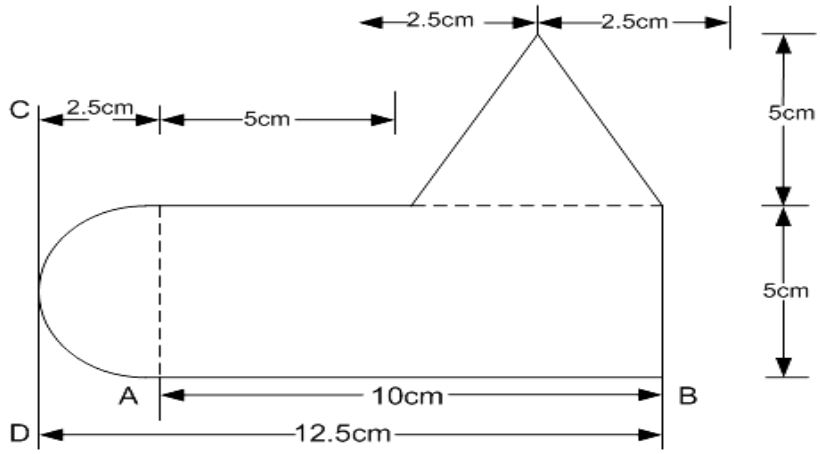


Fig.6

(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

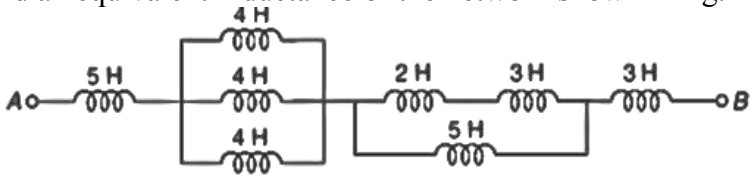
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

[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 Science)]

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

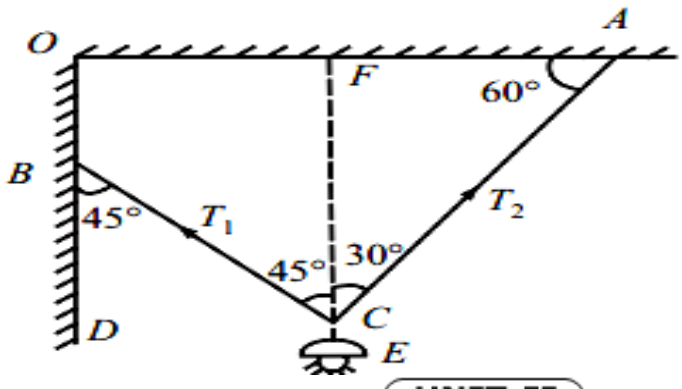
1.	a)	Briefly explain how Civil Engineering contributes for the welfare of society.	7 Marks	L1	CO1	PO1 PO6
	b)	The following observations were taken to a boundary from a chain line.	7 Marks	L4	CO1	PO1 PO2 PO5

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 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 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

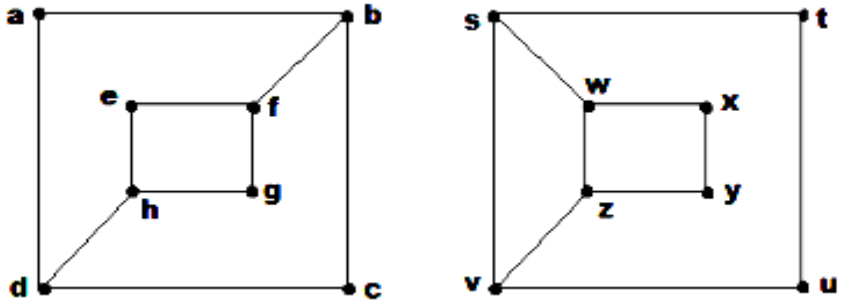
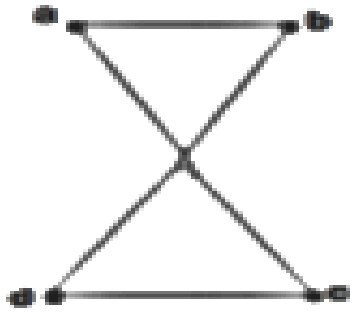
DISCRETE MATHEMATICAL STRUCTURES

[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

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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 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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

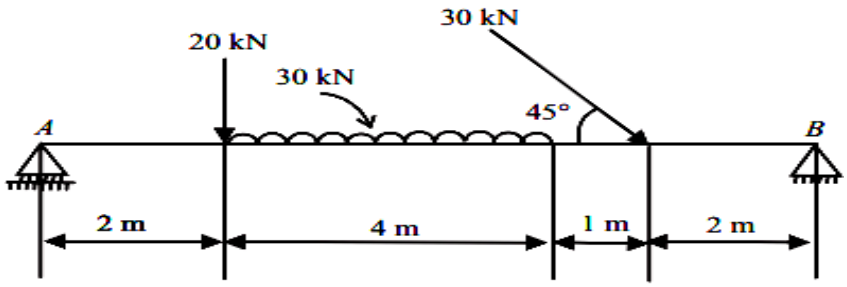

Fig.1

(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

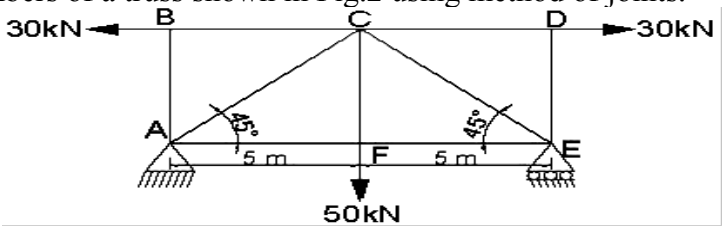

Fig.2

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

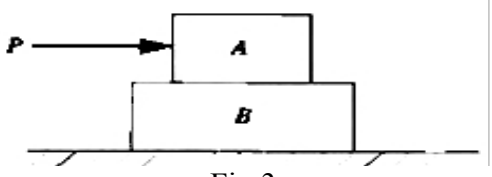

Fig.3

(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

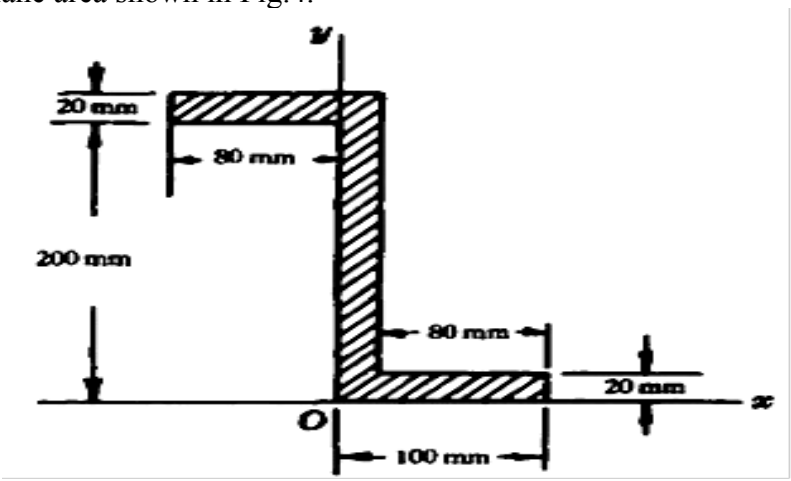

Fig.4

(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

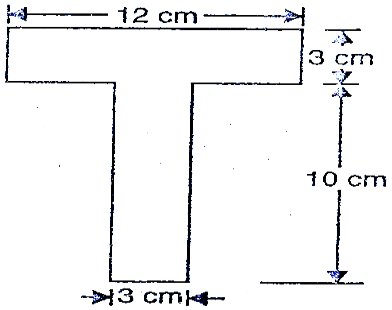

Fig.5

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

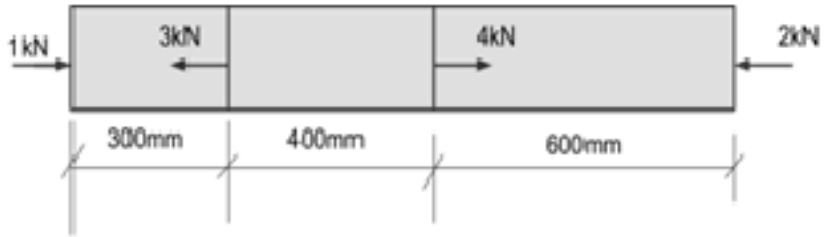

Fig.6

	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

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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

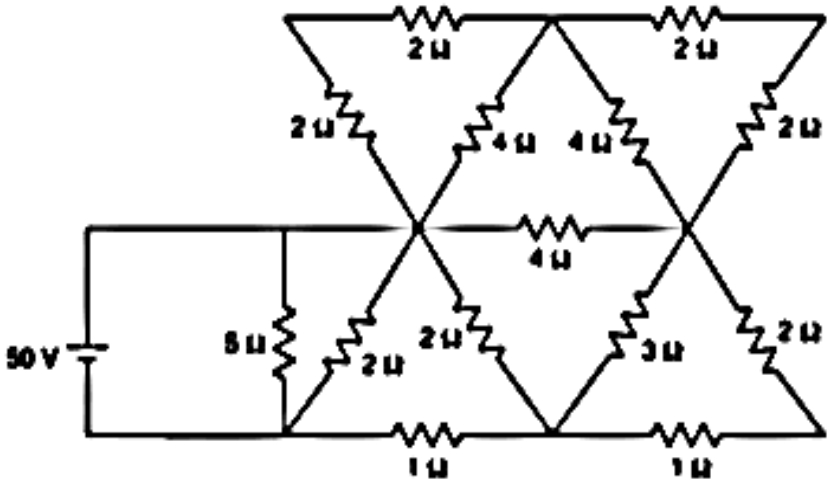
[Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering, Computer Science and Engineering (Artificial Intelligence),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

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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

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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.

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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.: 16BT1BS01 SVEC-16

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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. 6 Marks

i) $Al(s)/Al^{3+}(aq)//Ag^{+}(aq)/Ag(s)$

ii) $Zn(s)/Zn^{2+}(aq)//Cr^{3+}(aq)/Cr(s)$

iii) $Fe(s)/Fe^{2+}(aq)//Hg^{2+}(aq)/Hg(l)$

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

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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

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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

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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

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CODE No.: 16BT20102 SVEC-16

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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]

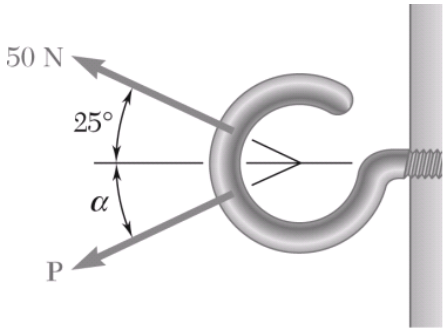
Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

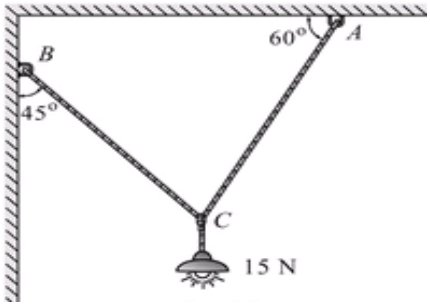
UNIT-I

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



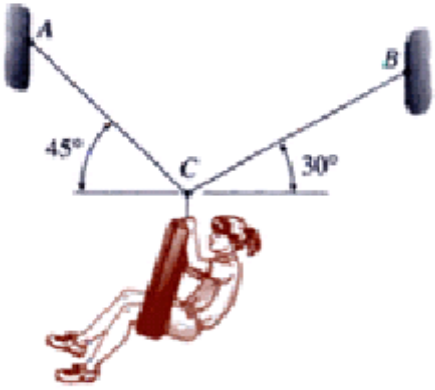
c) An electric light weighing 15N hangs from a point C by two strings AC and BC as shown in the figure, AC is inclined at 60^0 to the horizontal and BC at 45^0 to the vertical as shown. Find the forces in the strings AC and BC. 7 Marks



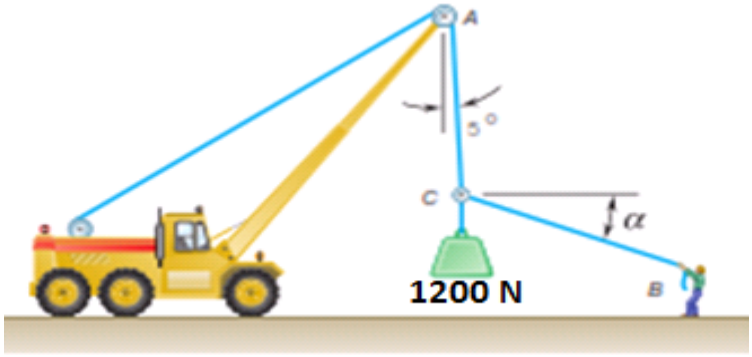
(OR)

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



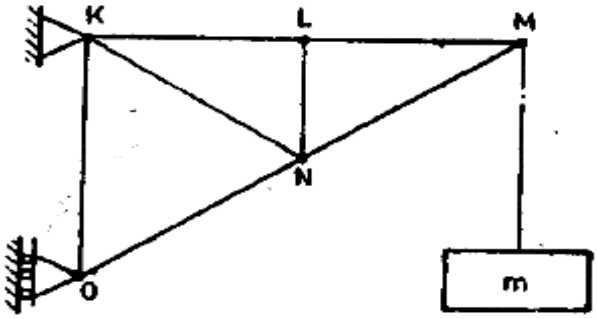
c) Knowing that $\alpha = 20^0$, determine the tension: 6 Marks
i) in cable AC, ii) in rope BC.



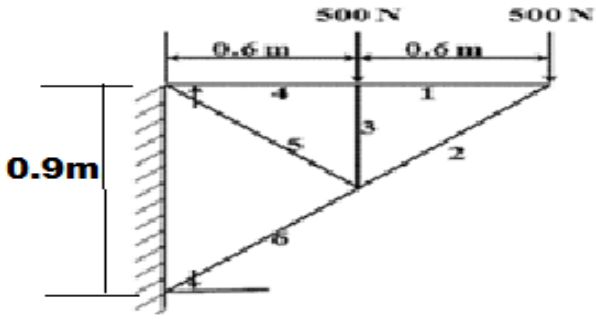
UNIT-II

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

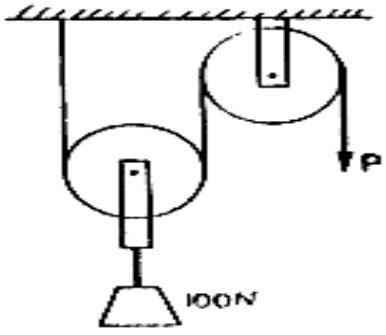


c) Determine the axial force in each bar of the plane truss loaded as shown in the figure. 7 Marks

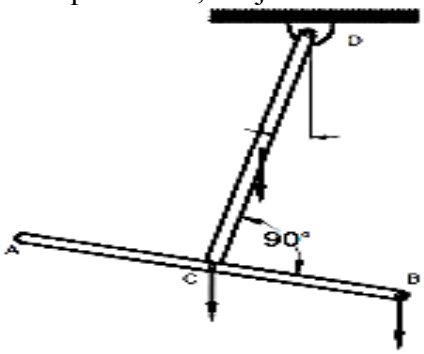


(OR)

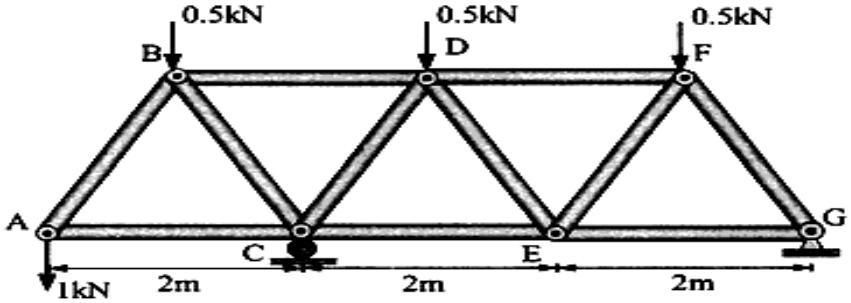
4 a) Using the principle of virtual work, determine the effort P required to hold the weight of 100N in equilibrium in a system of two frictionless pulleys of the same diameter as shown in figure. 3 Marks



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

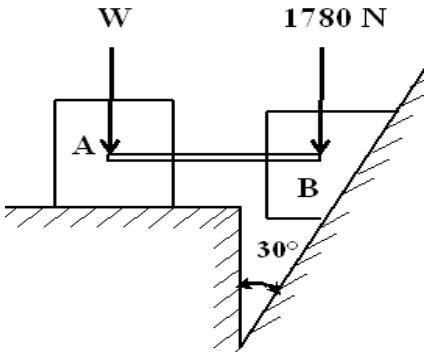


c) Using method of sections determine the forces in members BD and CD of the truss as shown in fig. All triangles are equilateral. 6 Marks

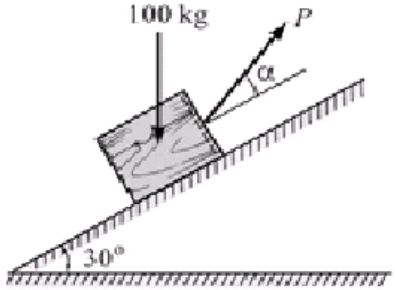


UNIT-III

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

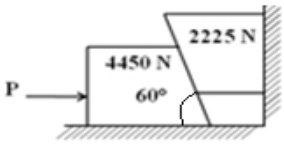


b) Determine the minimum value of force P required to cause motion of a 100 kg block to impend upon a 30° plane shown in figure. The coefficient of friction is 0.2. 7 Marks



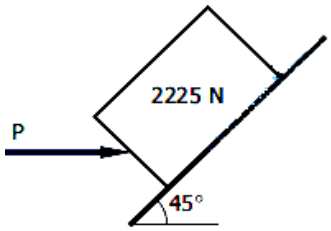
(OR)

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

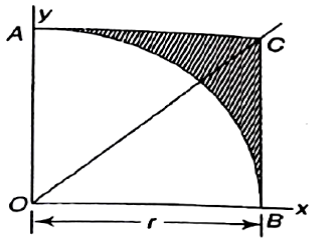
i) just start the block up the incline.
ii) just prevent motion down the incline.



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

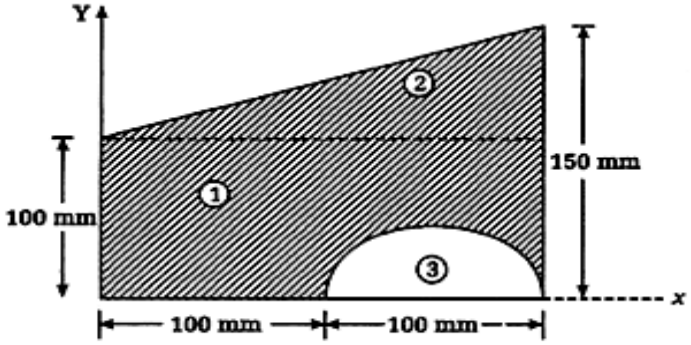


c) Explain the method of finding the centroids of composite area with suitable example. 5 Marks

(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

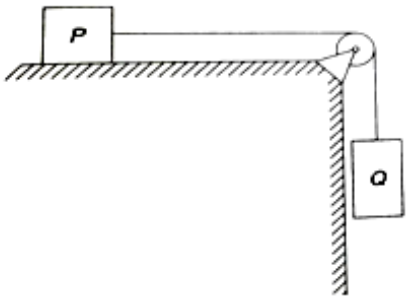
c) A car of mass 1500 kg is uniformly accelerated. Its speed increases from 50kmph to 75kmph after travelling a distance of 200m. The resistance to the motion of the car is 0.2% of the weight of the car. Determine (i) the maximum power required, (ii) the power required to maintain a constant speed of 75kmph. 7 Marks

(OR)

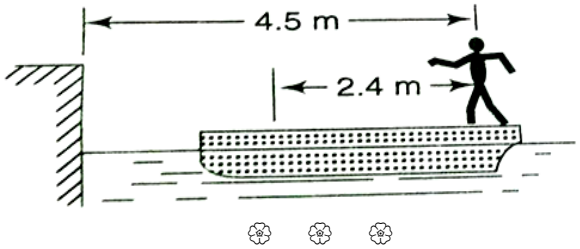
10 a) i) A car starts from rest with a constant acceleration of 4m/sec^2. Determine the distance travelled in the 7th second. 4 Marks

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]

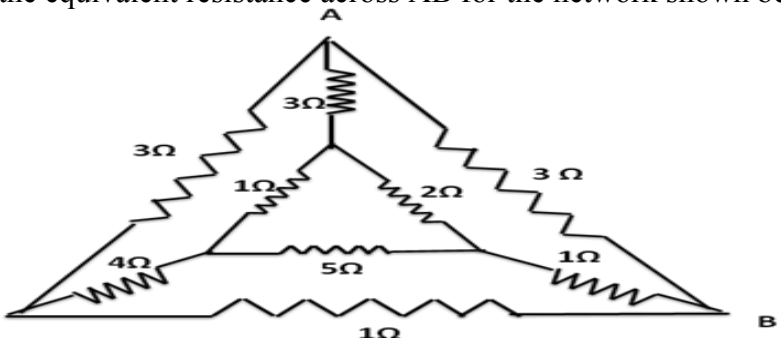
Time: 3 hours **Max. Marks: 70**

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

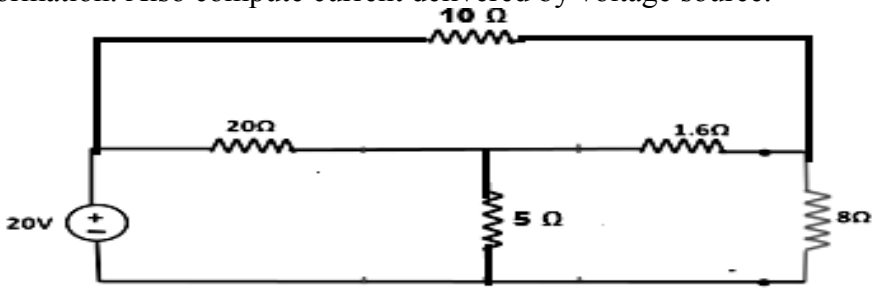
b) Compute the equivalent resistance across AB for the network shown below. 7 Marks



(OR)

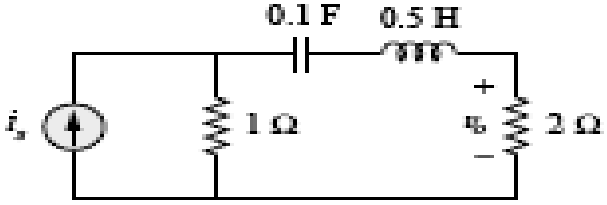
2 a) State and explain the terms node, loop, path with examples. 6 Marks

b) Compute the equivalent resistance across voltage source using star/delta transformation. Also compute current delivered by voltage source. 8 Marks

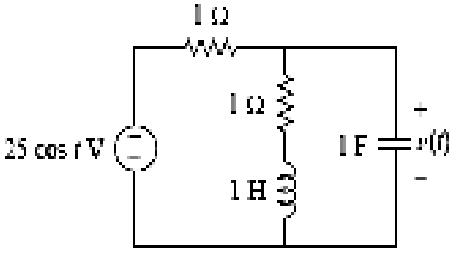


UNIT-II

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



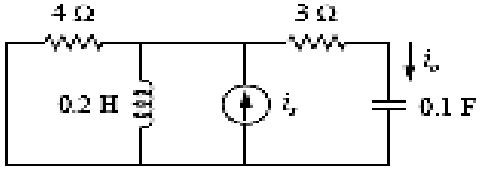
b) Compute the V(t), shown in figure below. 7 Marks



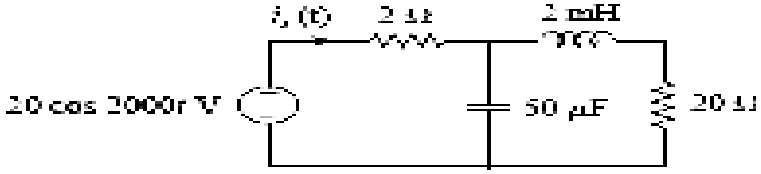
(OR)

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)

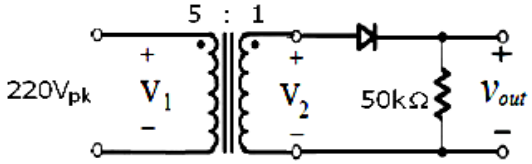
8 a) State the need for data acquisition system, explain the data acquisition system with the help of block diagram. 7 Marks

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

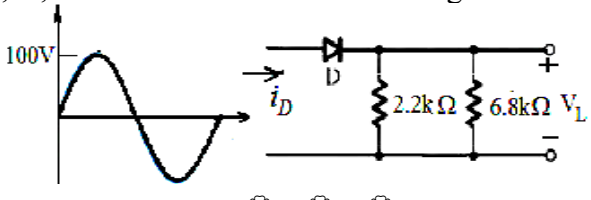
b) A 5:1 transformer is connected to a half wave rectifier circuit with a 50 kΩ load. Find i) V_p; ii)I_p; iii) I_{dc}; iv) I_{ac}. In put voltage is 220 V_{pk}. 8 Marks



(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.

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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 3×10^{-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

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CODE No.: 16BT20541 SVEC-16

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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

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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

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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

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

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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

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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]

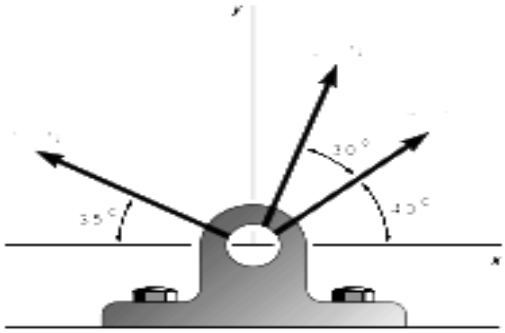
Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit.
All questions carry equal marks.

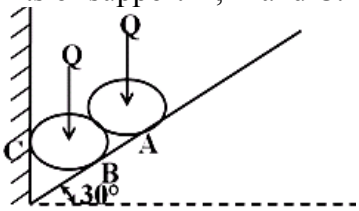
UNIT-I

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



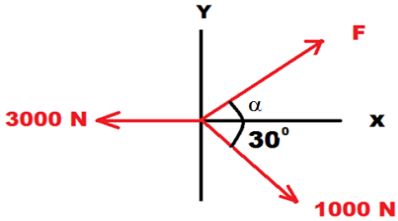
c) Two identical rollers each of weight Q = 445N are supported by an inclined plane and a vertical wall as shown in figure. Assuming smooth surfaces, find the reactions induced at the points of support A, B and C. 7 Marks



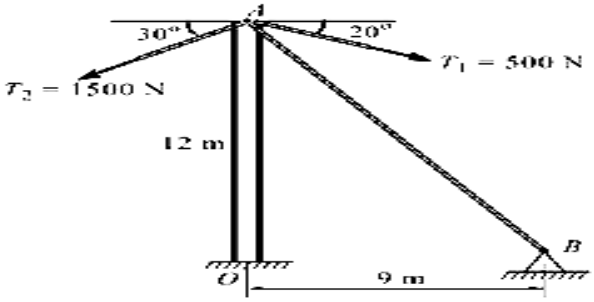
(OR)

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



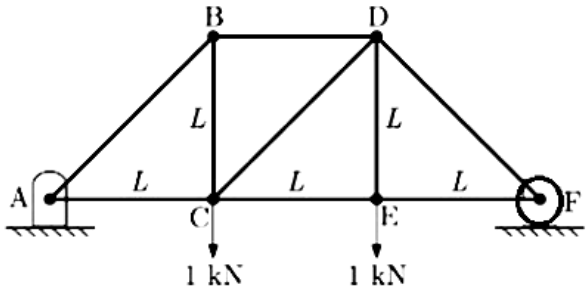
c) The top end of vertical boot is connected by two cables having tension T_1=500N and T_2=1500N as shown in figure. The third cable AB is used as a guy wire. Determine the tension in cable AB if resultant of the three concurrent forces acting at A is vertical. Also find the resultant. 7 Marks



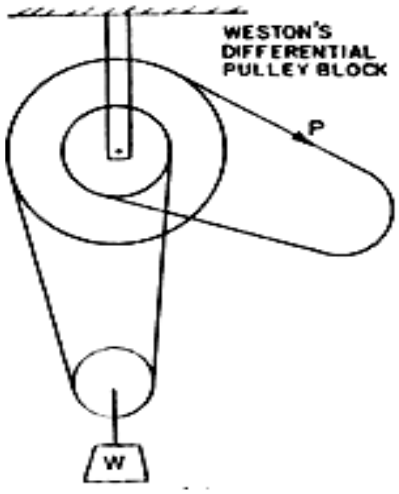
UNIT-II

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



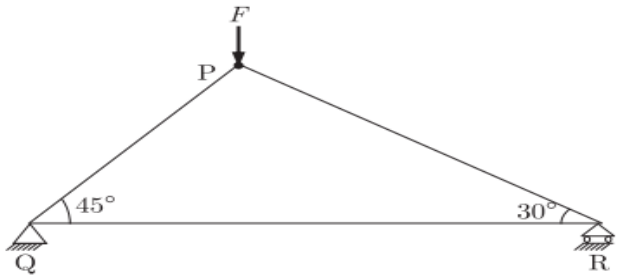
c) The diameters of the two steps of the pulley of a Weston's differential pulley block are 40cm and 30cm respectively. Determine the value of the effort required to lift a load of 4KN using the principle of virtual work. Neglect the frictional forces. 7 Marks



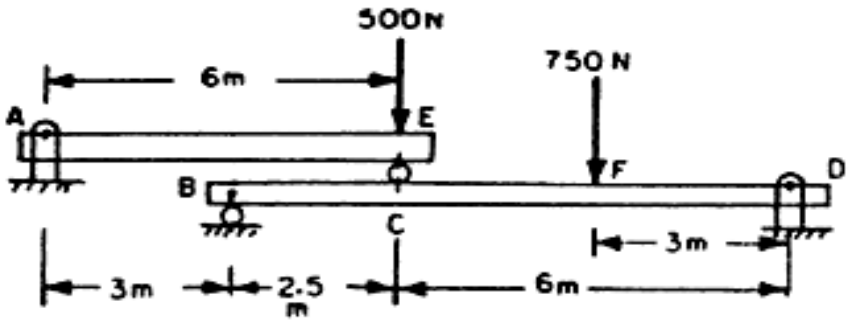
(OR)

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

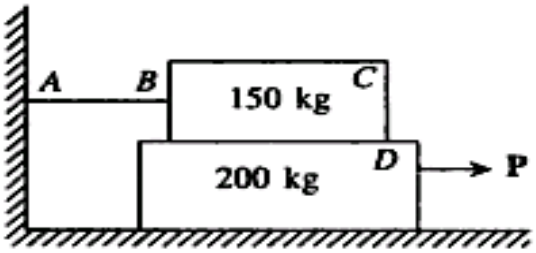


c) Determine the reactions at rollers B and C of the beam shown in figure using the method of virtual work. 7 Marks

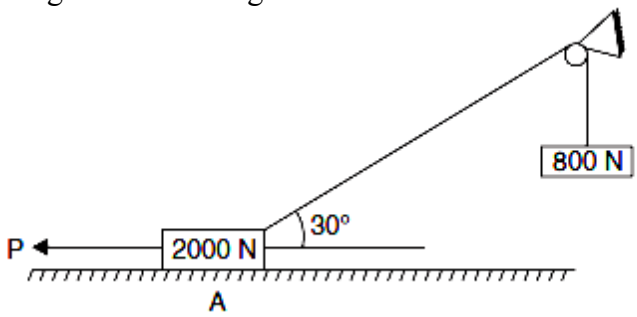


UNIT-III

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

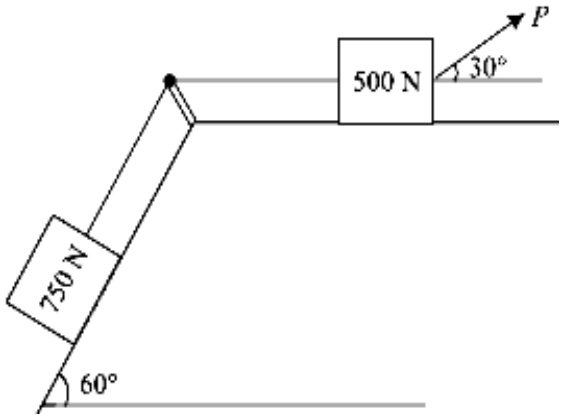


b) The block A shown in figure weighs 2000N. The cord attached to if passes over a frictionless pulley and supports a weight equal to 800N. The value of coefficient friction between A and the horizontal plane is 0.35. Determine the horizontal force P: (i) If the motion is impending towards the left. (ii) if the motion is impending towards the right. 6 Marks

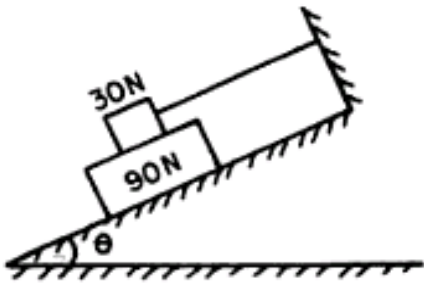


(OR)

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



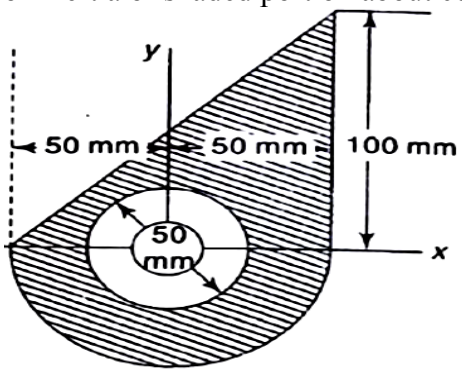
b) What should be the value of the angle θ in figure so that the motion of the 90 N block impends down the plane? The coefficient of friction μ for all the surfaces is 1/3. 7 Marks



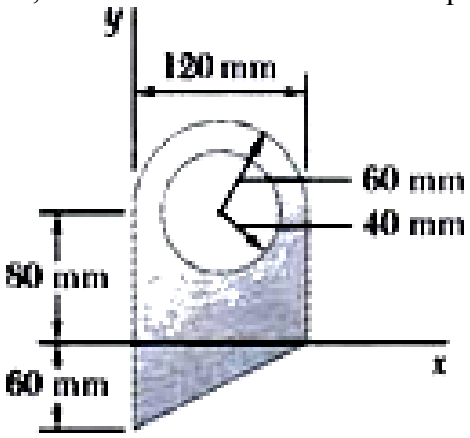
UNIT-IV

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



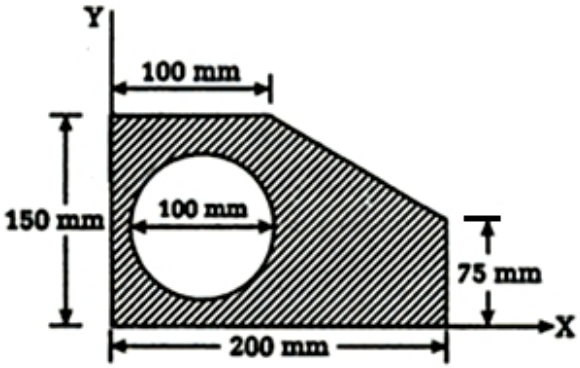
c) For the plane area shown, determine the centroid with respect to the x-axis. 4 Marks



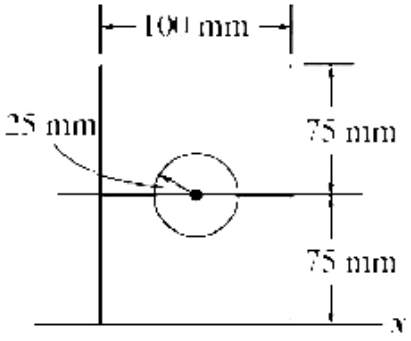
(OR)

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

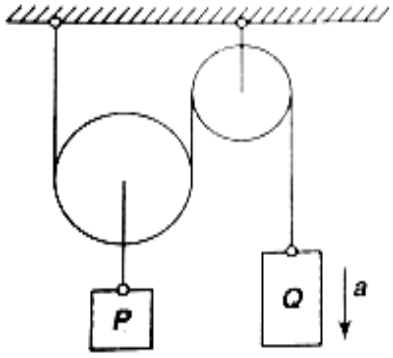
(OR)

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

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

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

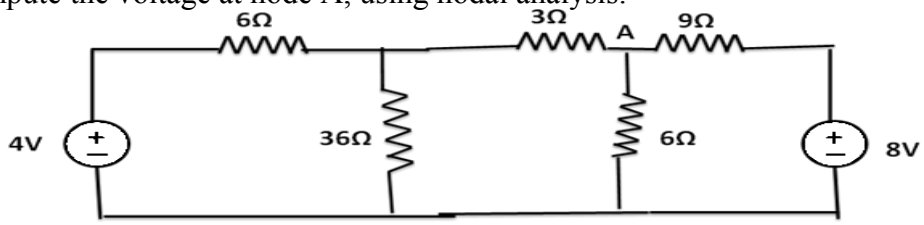
[Civil Engineering, Mechanical Engineering]

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

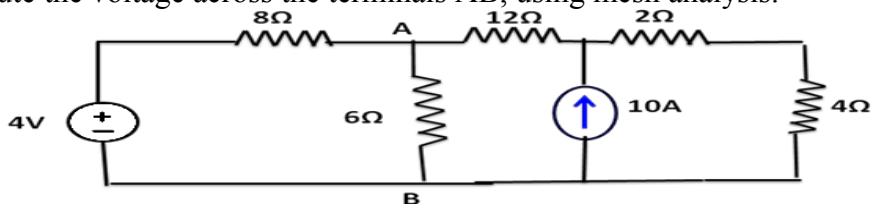
Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1 a) Compute the voltage at node A, using nodal analysis. 7 Marks

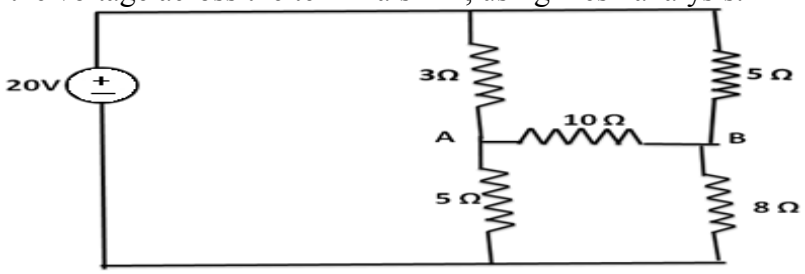


b) Compute the voltage across the terminals AB, using mesh analysis. 7 Marks

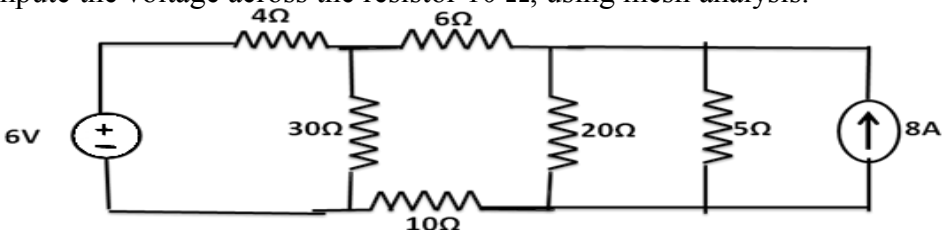


(OR)

2 a) Compute the voltage across the terminals AB, using mesh analysis. 7 Marks

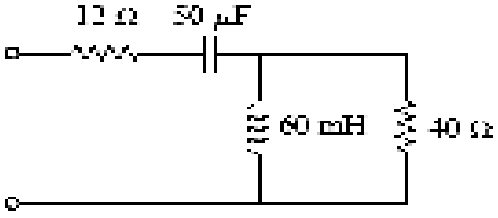


b) Compute the voltage across the resistor 10 Ω, using mesh analysis. 7 Marks

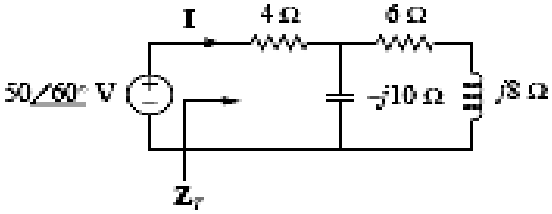


UNIT-II

3 a) Find the input impedance of the circuit, assume ω = 377 rad/sec. 7 Marks

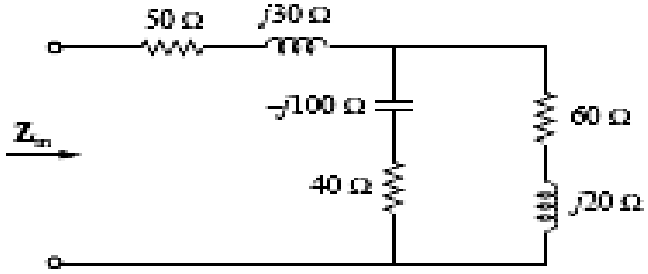


b) Find Z_f and I in the circuit shown below. 7 Marks

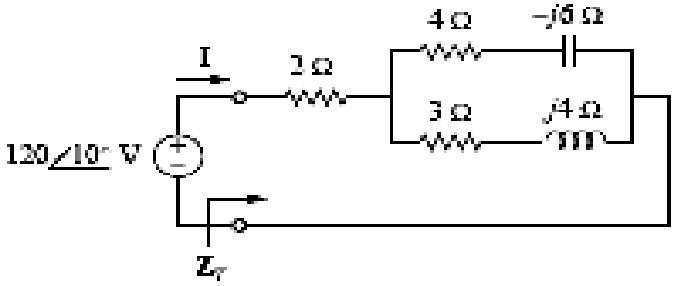


(OR)

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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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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 $F_1(A, B, C) = \Sigma m(3, 5, 6, 7)$; $F_2(A, B, C) = \Sigma m(0, 2, 4, 7)$ Implement the circuit with a PLA having three inputs, four product terms and two outputs.	14 Marks

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 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

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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

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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 25°C (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

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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

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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

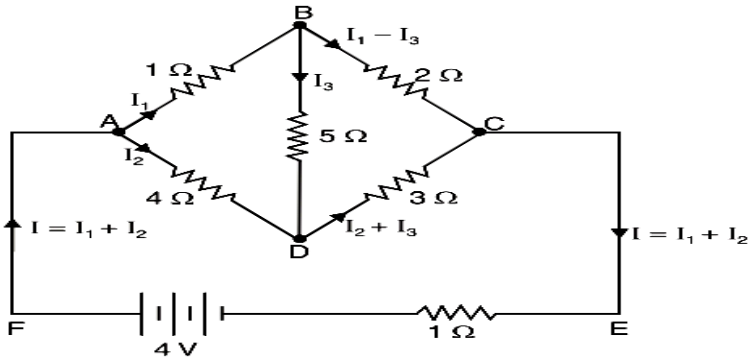
[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

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

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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

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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

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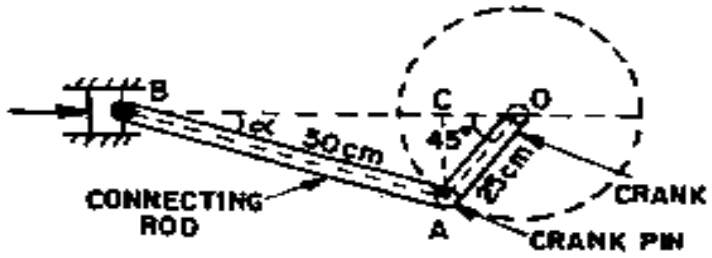
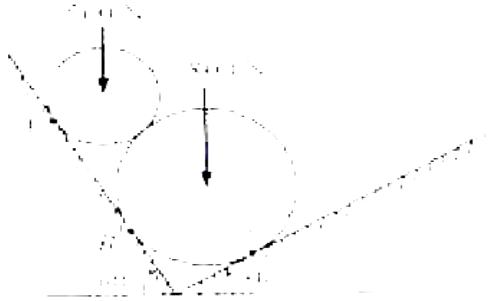
I B.Tech II Semester (SVEC-19) Supplementary Examinations August – 2021

ENGINEERING MECHANICS
[Civil Engineering]

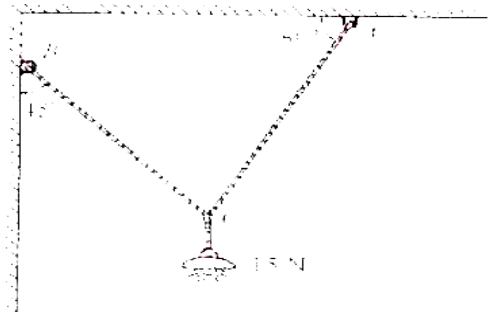
Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

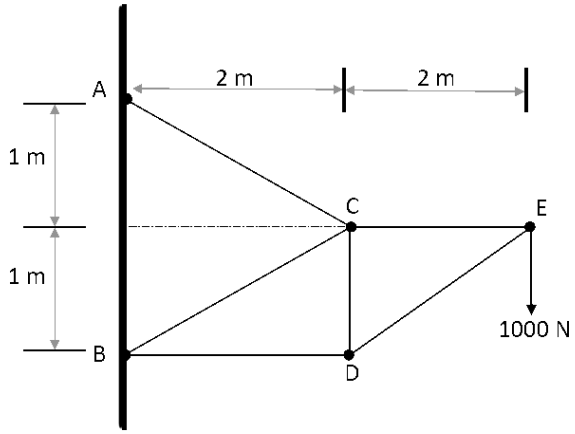
UNIT-I

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)

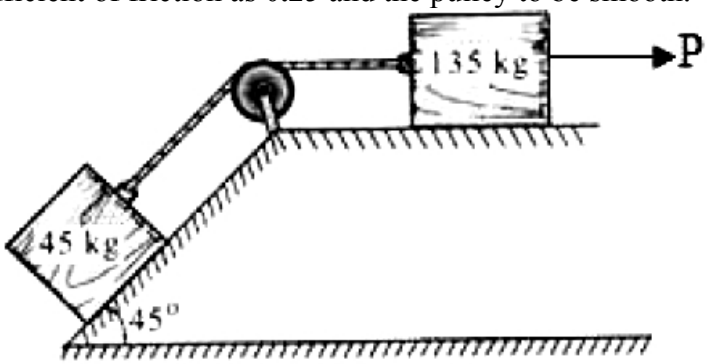
2.	a)	An electrical light weighing 15N hangs from a point C by the two strings AC and BC as shown in the figure. AC is inclined at 60^0 to the horizontal and BC at 45^0 to the vertical. Using Lami's theorem, find the forces in the strings AC and BC. Find the tension in each cable for the given figure. 	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

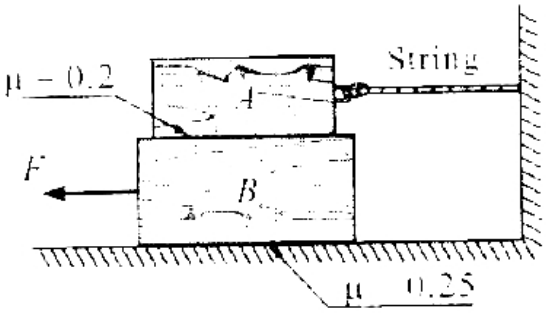
3.	a)	Determine the necessary force P acting parallel to the plane to cause motion to impend as shown in the figure. Assume coefficient of friction as 0.25 and the pulley to be smooth.	8 Marks	L4	CO1	PO1 PO2



	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

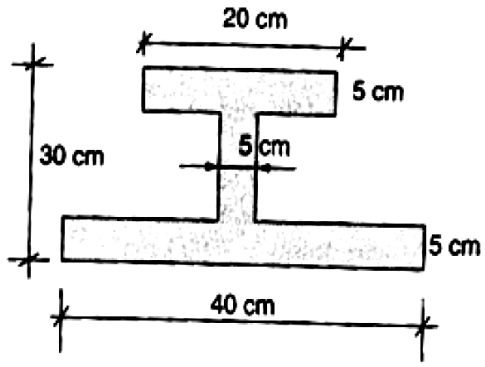


UNIT-III

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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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I B.Tech II Semester (SVEC-19) Supplementary Examinations August – 2021

ELECTRIC CIRCUITS

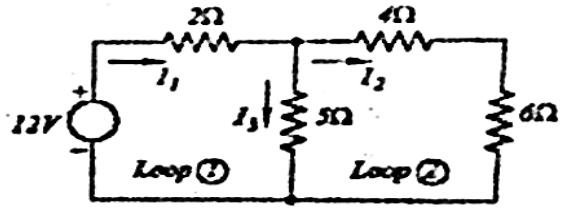
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

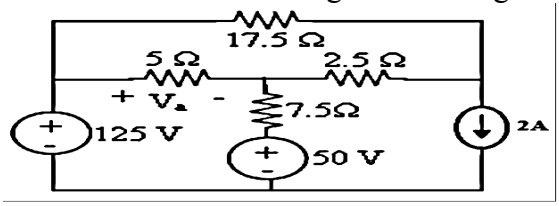
UNIT-I

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

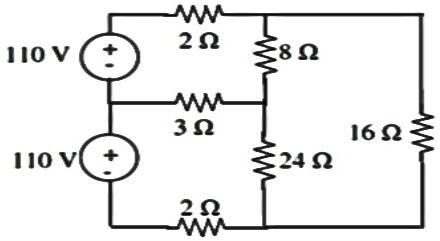


(OR)

2.	a)	Find the value of V_a for the following circuit using KVL.	6 Marks	L3	CO1	PO3

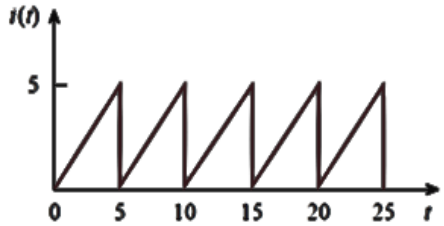


	b)	Using nodal analysis find all branch currents for the following circuit.	6 Marks	L3	CO1	PO2



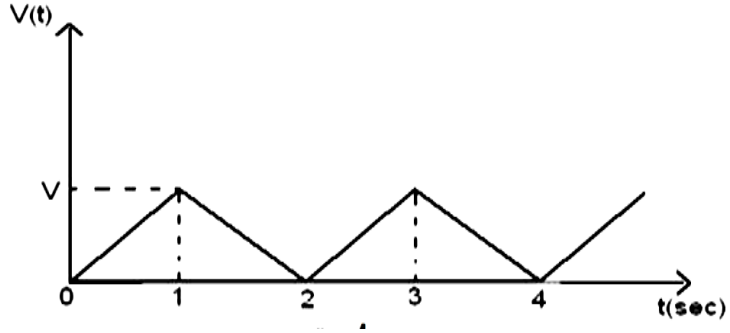
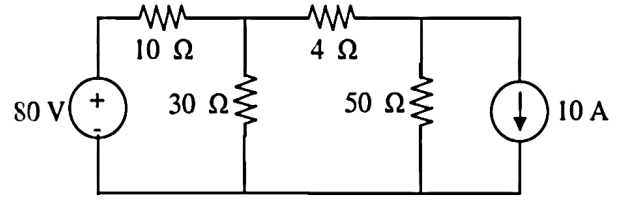
UNIT-II

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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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I B.Tech II Semester (SVEC-19) Supplementary Examinations August – 2021

NETWORK ANALYSIS

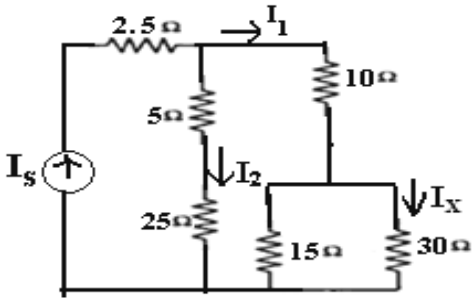
[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

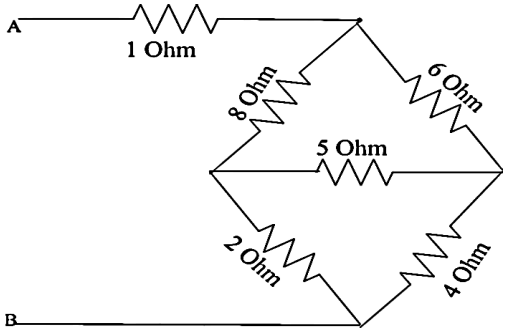
Answer One Question from each Unit
All questions carry equal marks

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.

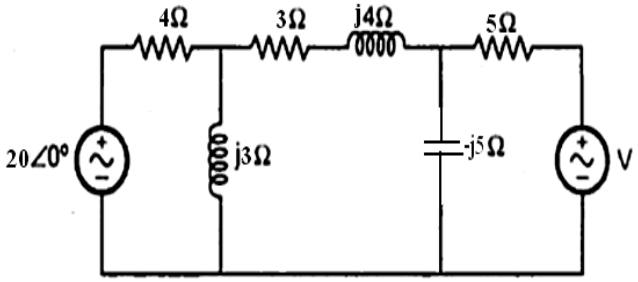


   b) Find equivalent resistance across terminals A-B for the circuit shown below. 6 Marks L3 CO1 PO2

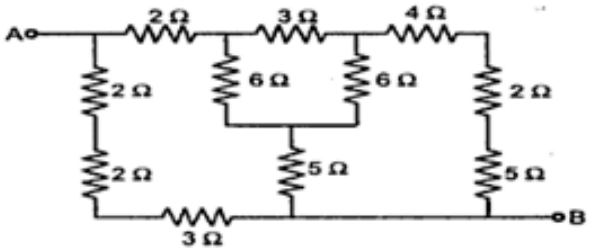


(OR)

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

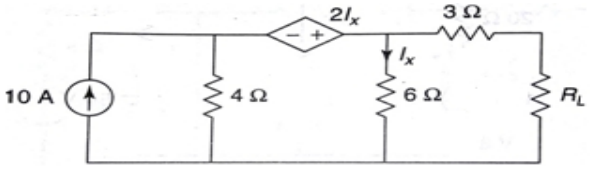


UNIT-II

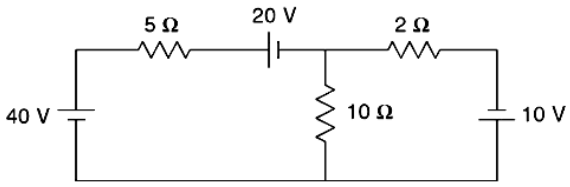
3.	a)	A two element series circuit is connected across AC source given by V=200√2Sin(314t+20º).The current in the circuit is found to be i=10√2 cos(314 t-25º).Determine the parameters of the circuit. Also determine the power factor, real power and reactive power taken by the circuit.	6 Marks	L3	CO2	PO2
	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

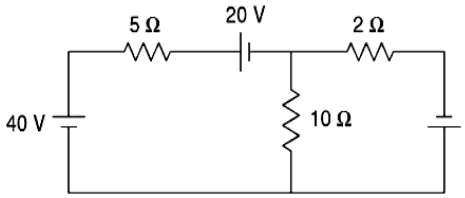
5.	a)	For the network shown below calculate the maximum power delivered to load resistance R_L.	8 Marks	L3	CO1	PO2



	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

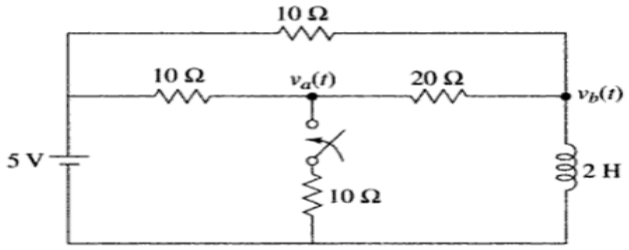


	b)	Find the current through 2Ω resistor using super position theorem.	6 Marks	L3	CO1	PO2



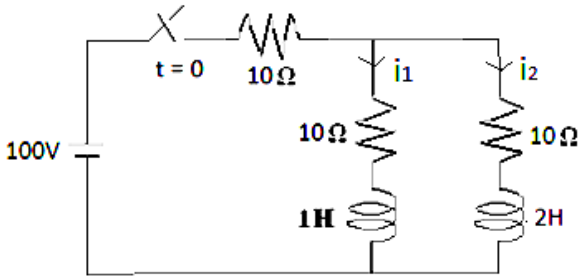
UNIT-IV

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



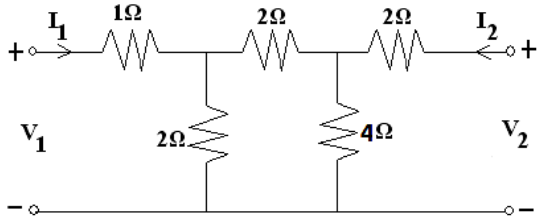
(OR)

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

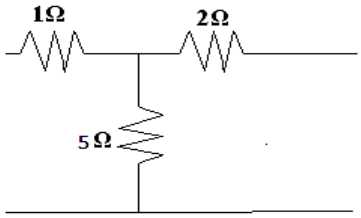
9.	a)	Find the Y parameters for the network.	6 Marks	L3	CO1	PO2



	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

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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

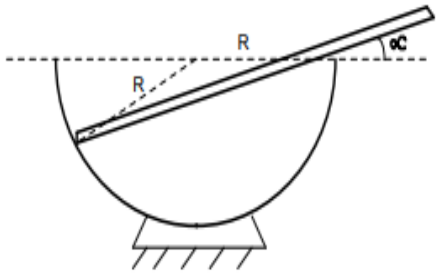
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

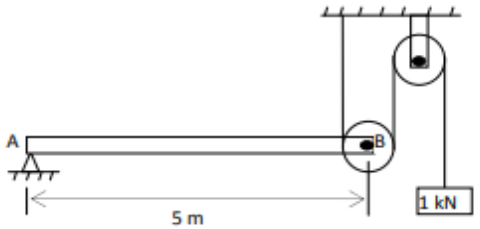
UNIT-I

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



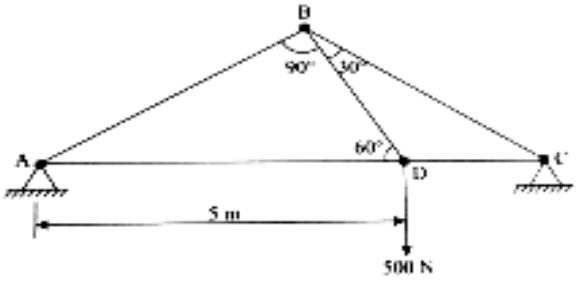
UNIT-II

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

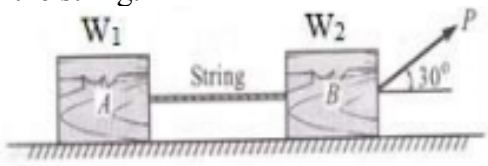
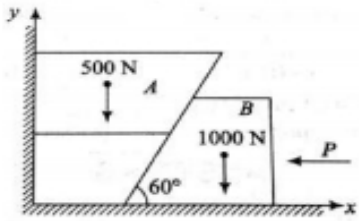


(OR)

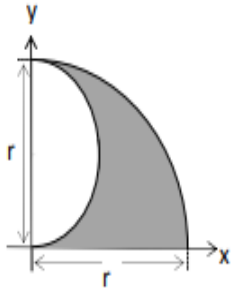
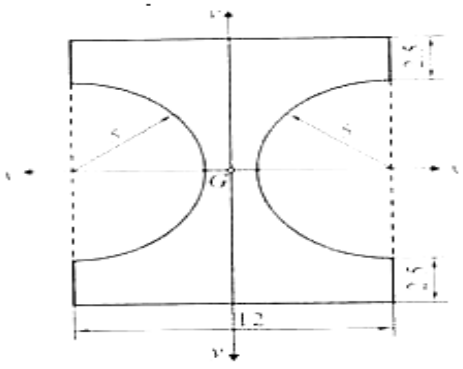
4.		A truss is loaded as shown in figure. Find the forces in members AB, BD and BC.	12 Marks	L2	CO1	PO1 PO2



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

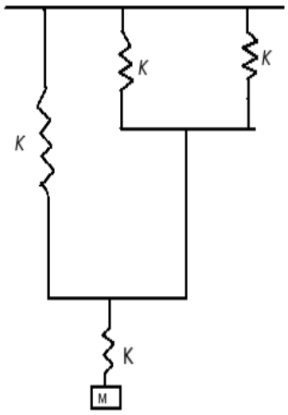
7.	a)	Find the centroid for the shaded area shown. 	6 Marks	L3	CO2	PO1 PO2
	b)	State and prove Parallel Axis theorem.	6 Marks	L3	CO2	PO1
		(OR)				
8.		Find the moment of inertia of the plane area, about centriodal x and y-axis. 	12 Marks	L3	CO2	PO1 PO2

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



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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

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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

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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

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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

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

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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

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(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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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I B.Tech II Semester (SVEC-19) Supplementary Examinations March – 2021

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

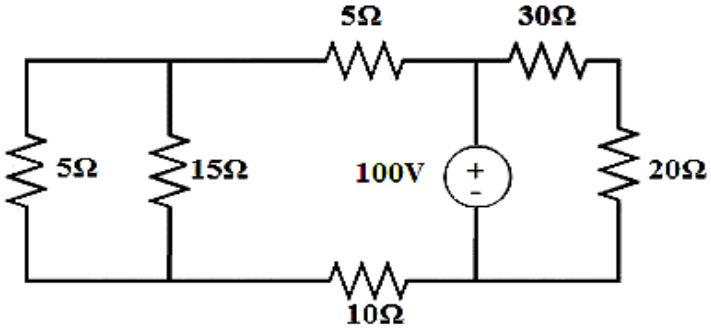
[Civil Engineering, Mechanical Engineering, Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

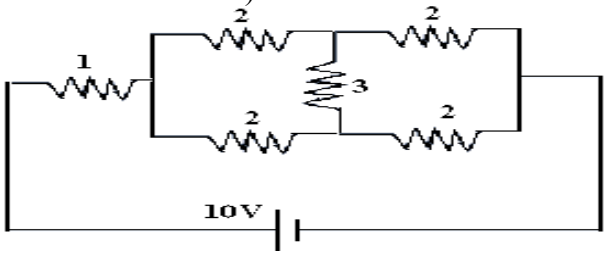
UNIT-I

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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

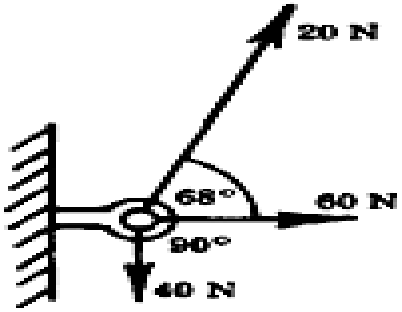

Fig.1

(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

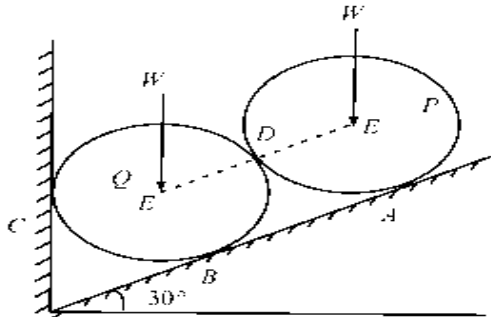

Fig.2

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

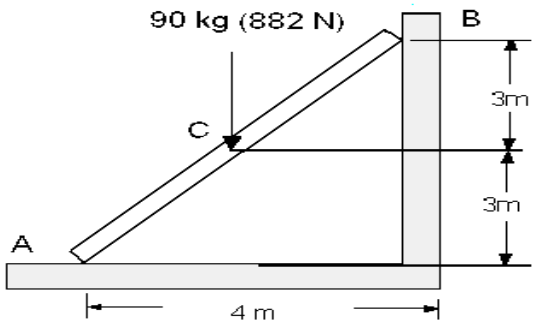

Fig.3

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

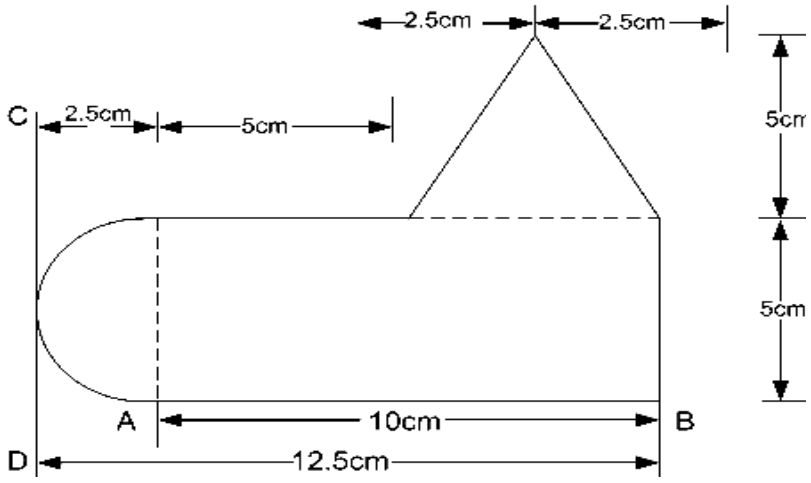

Fig.4

(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

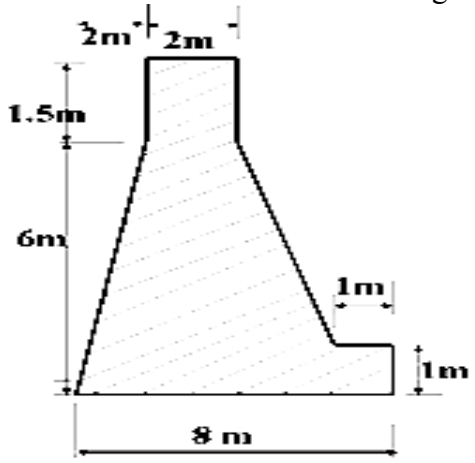

Fig.5

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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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I B.Tech II Semester (SVEC-19) Supplementary Examinations March – 2021

ELECTRIC CIRCUITS

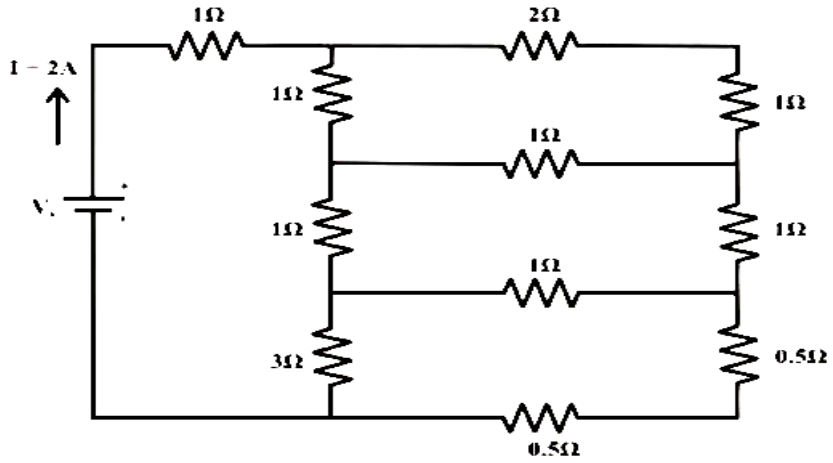
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

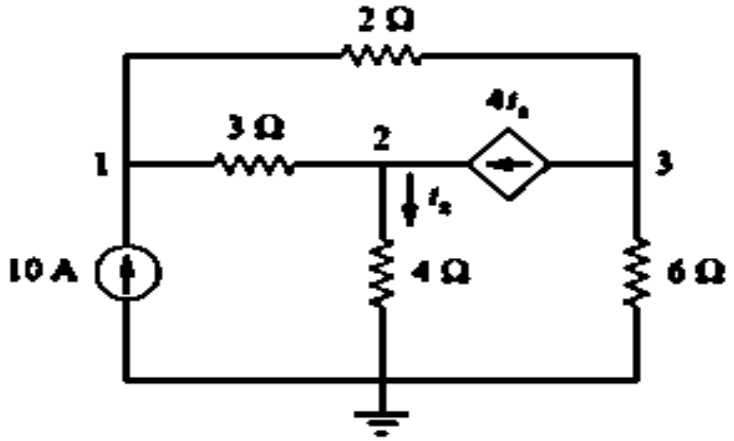
Answer One Question from each Unit
All questions carry equal marks

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

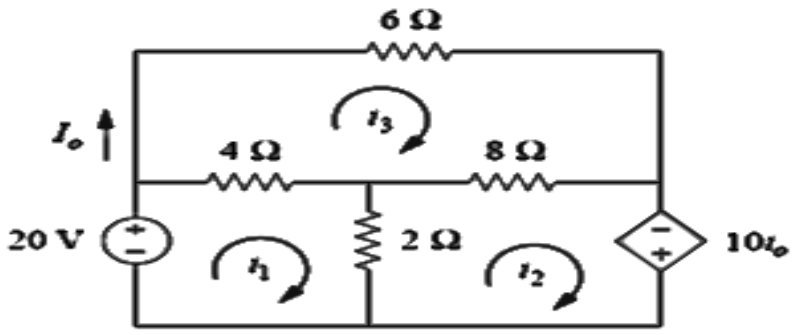


b) Find the voltages at the three non reference nodes in the circuit of figure 6 Marks L4 CO1 PO2

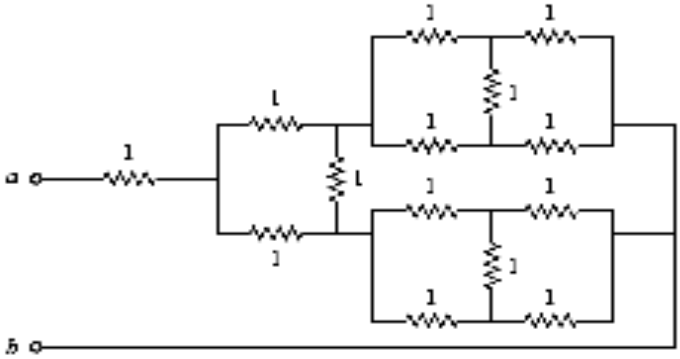


(OR)

2. a) Using mesh analysis, find I_0 in the circuit shown in figure. 6 Marks L4 CO1 PO2

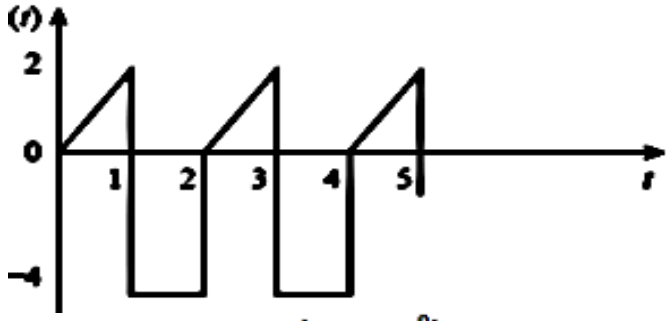


	b)	Find R_{ab} of the network shown in figure, Assume each element is 1Ω.	6 Marks	L3	CO1	PO2

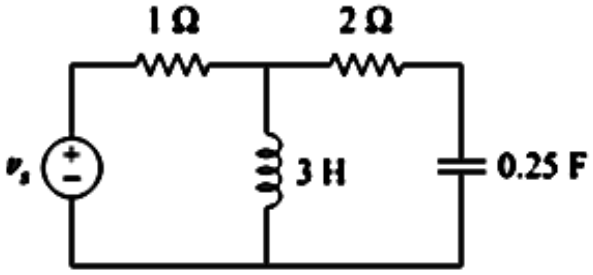


UNIT-II

3.	a)	Determine the form factor of the wave form shown in figure.	6 Marks	L3	CO1	PO2

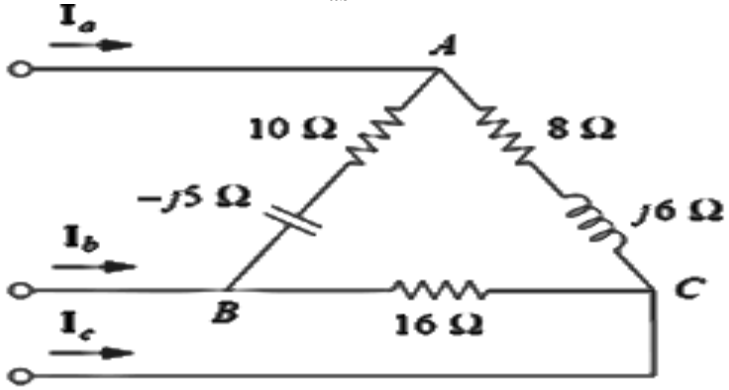


	b)	Assuming that $v_s = 16\cos(2t - 40^0)V$ in the circuit of shown in figure, find the average power delivered to each of the passive elements.	6 Marks	L3	CO2	PO2



(OR)

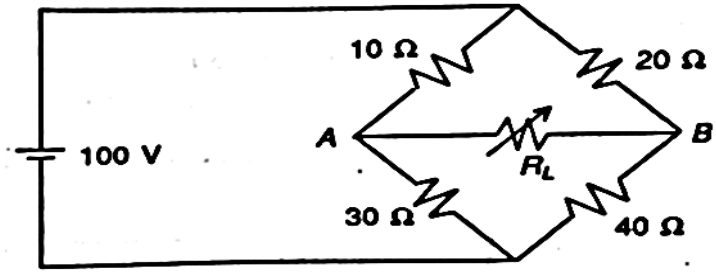
4.	a)	The unbalanced delta-load shown in figure is supplied by balanced line-to-line voltages of 240 V in the positive sequence. Find the line currents. Take V_{ab} as reference.	6 Marks	L3	CO1	PO2



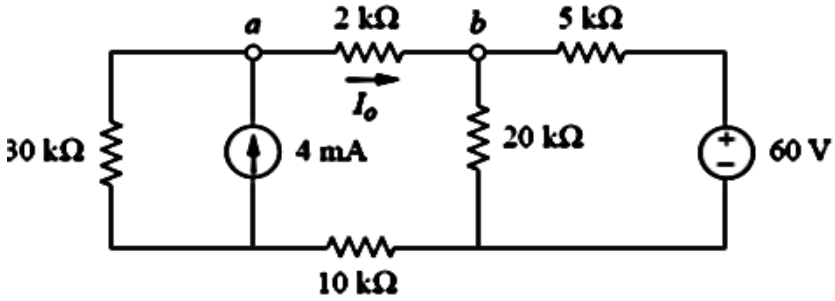
	b)	Explain how a single wattmeter can be used to measure the reactive power with the help of circuit connection and derive the necessary equations.	6 Marks	L2	CO1	PO1

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

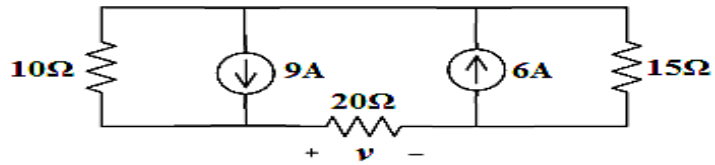


	b)	Consider the circuit in figure, an ammeter with internal resistance R_I is inserted between **a** and **b** to measure I_0. Determine the reading of the ammeter if: R_I=500Ω, 0Ω using Thevenin's theorem.	6 Marks	L4	CO1	PO5

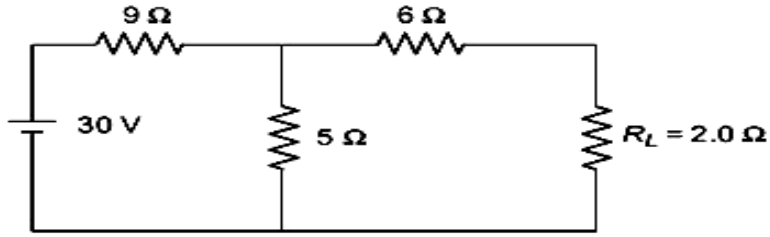


(OR)

6.	a)	In the circuit shown below, find the voltage across the 20Ω resistor using Superposition Theorem.	6 Marks	L3	CO1	PO5

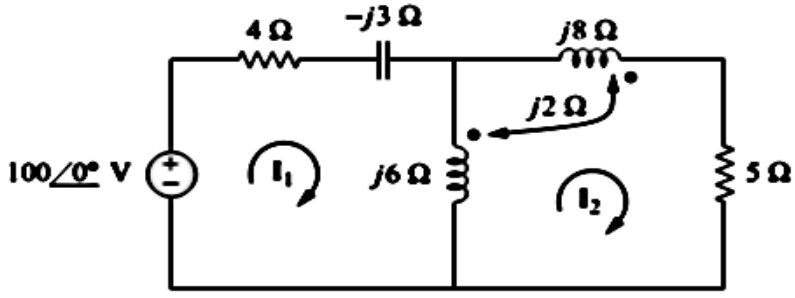


	b)	Calculate the change in current of the network given below using compensation theorem when load resistor changes to 10Ω.	6 Marks	L3	CO1	PO5



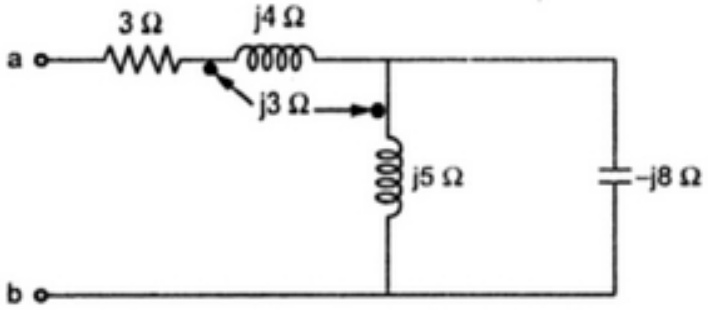
UNIT-IV

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

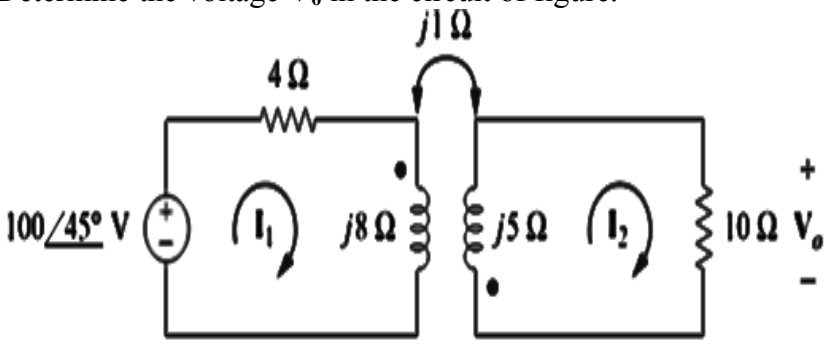


(OR)

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

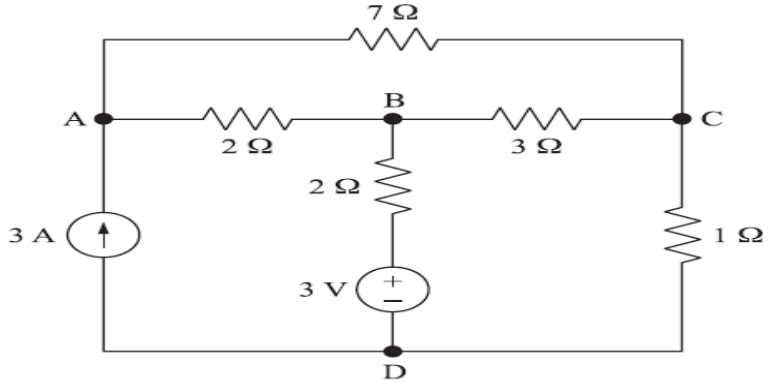
NETWORK ANALYSIS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

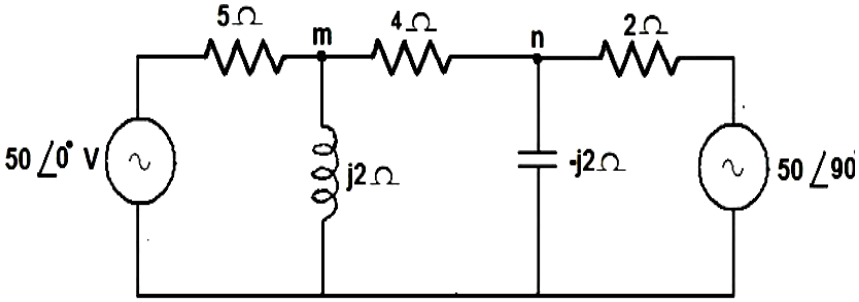
Time: 3 hours **Max. Marks: 60**

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

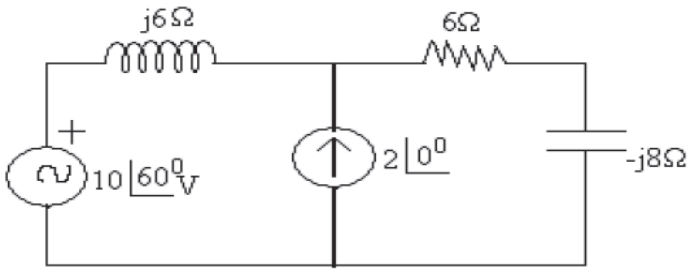
3.	a)	Draw the current, impedance and admittance loci for an RC Series circuit having constant reactance but variable resistance.	6 Marks	L2	CO1	PO1
	b)	A TV tuner consists of a series RLC circuit consists of resistance R = 20, inductance, L = 0.01H and capacitance, C = 0.04 μF. Calculate the frequency 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

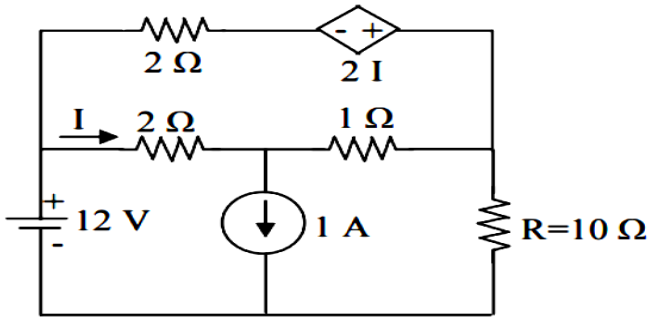
UNIT-III

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



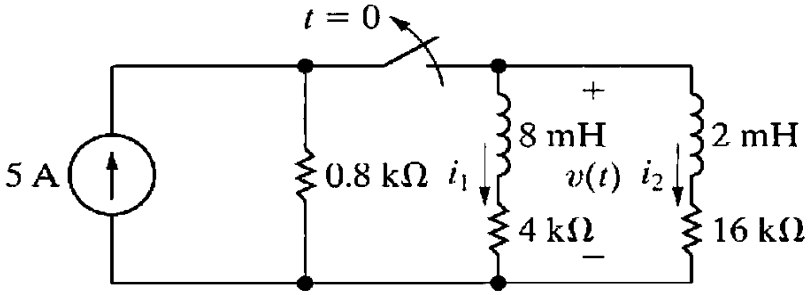
(OR)

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



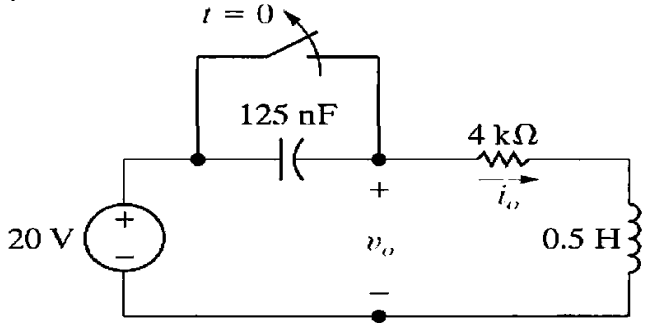
UNIT-IV

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



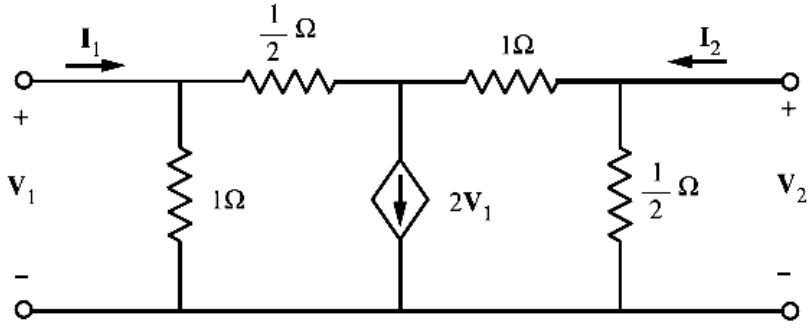
(OR)

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



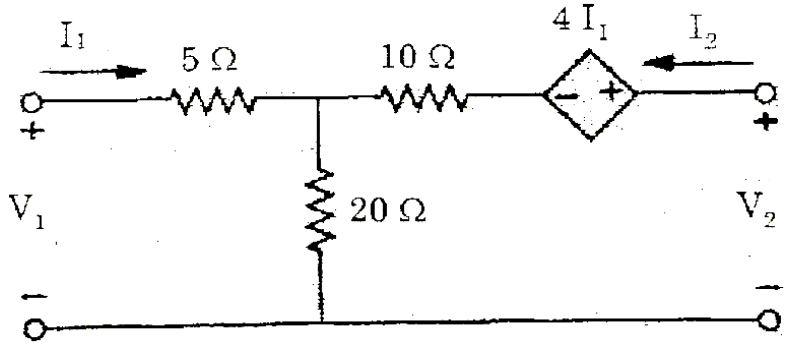
UNIT-V

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

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I B.Tech II Semester (SVEC-19) Supplementary Examinations March – 2021

BASIC ENGINEERING MECHANICS

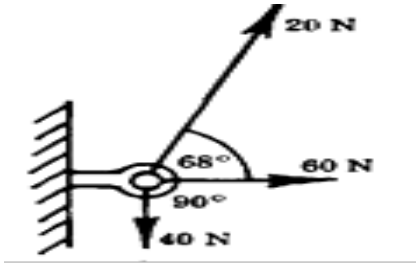
[Mechanical Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

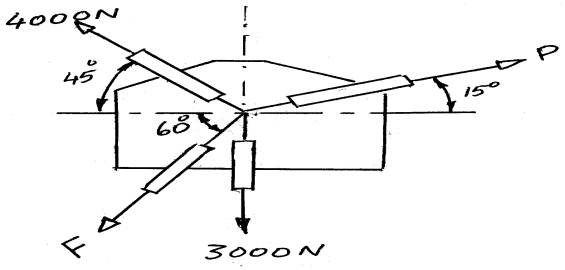
UNIT-I

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



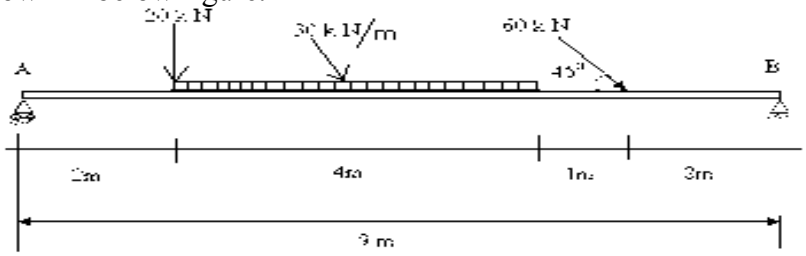
(OR)

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



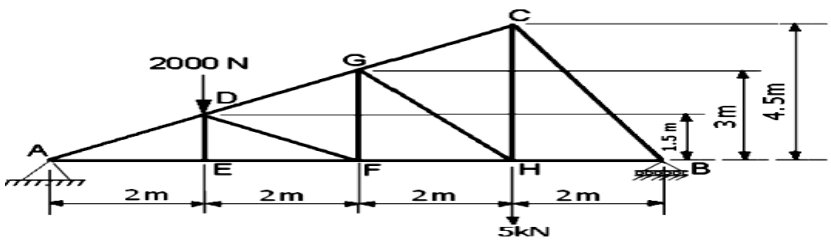
UNIT-II

3.	Find the reactions at the supports A and B of the loaded beam shown in below figure.	12 Marks	L2	CO1	PO1 PO2

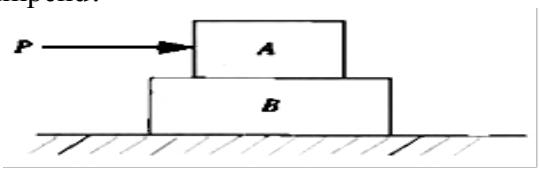


(OR)

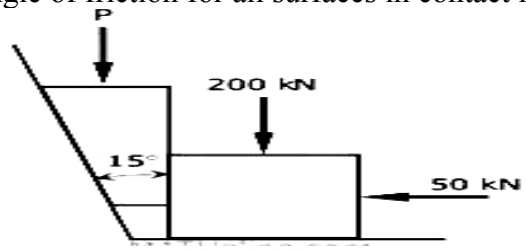
4.	Calculate the forces included in the members of the pin-jointed truss shown in figure. Show the values on a neat diagram of the truss.	12 Marks	L2	CO1	PO1 PO2



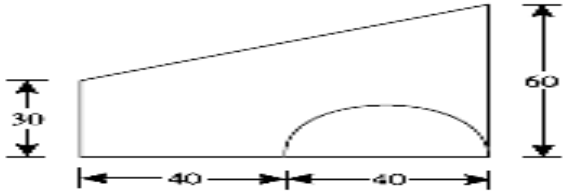
UNIT-III

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

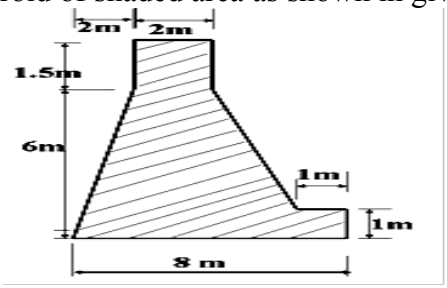
(OR)

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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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) 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

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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

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CODE No.: 20BT1BS04 SVEC-20

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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

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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

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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

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CODE No.: 20BT10201 SVEC-20

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

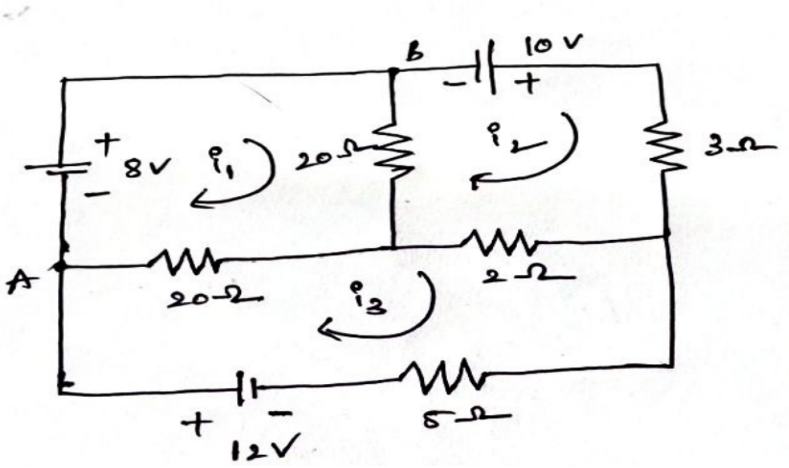
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

[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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

ELECTRICAL CIRCUITS

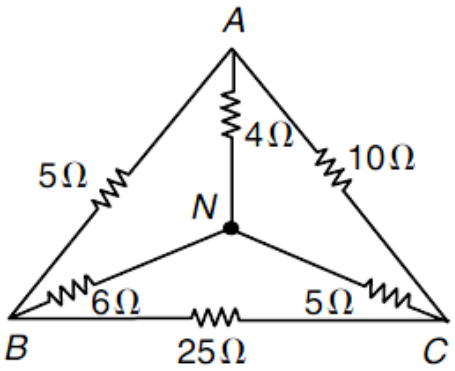
[Electrical and Electronics Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

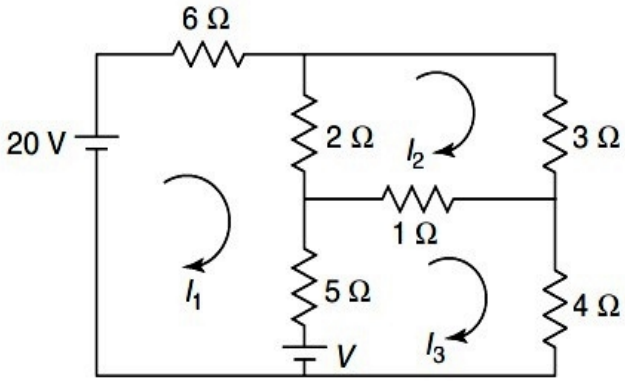
UNIT-I

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

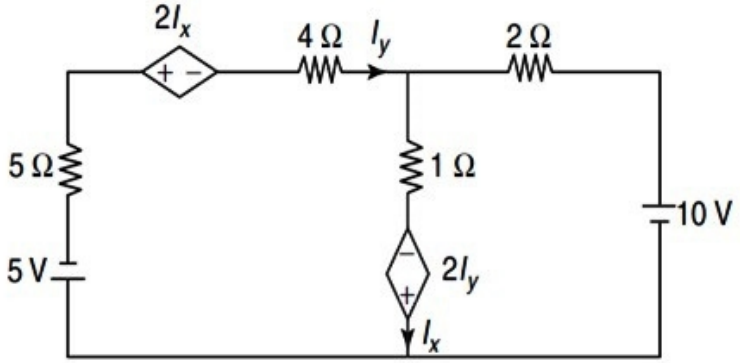


(OR)

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

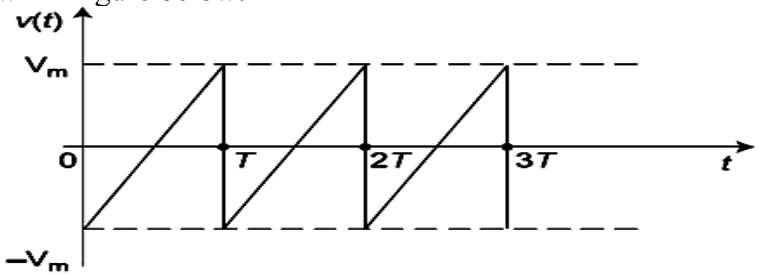


	b)	Find currents I_X and I_Y of the network shown in the Fig.	7 Marks	L3	CO1	PO4



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

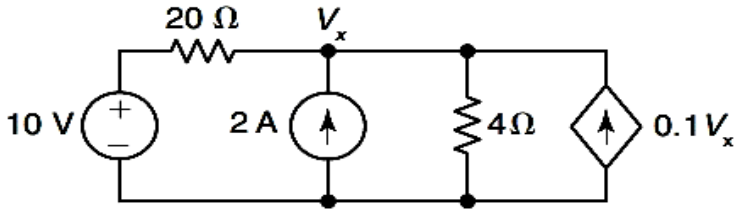


(OR)

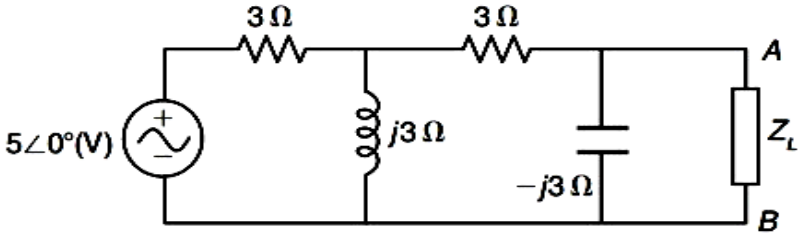
4.	a)	In a particular RL series circuit, a voltage of 10V at 50Hz produces a current of 700mA while the same voltageat 75Hz produces a current of 500mA. Design the values of R and L in the circuit?	7 Marks	L6	CO2	PO3
	b)	A series RLC circuit consists of a resistance of 1kΩ, an inductance of 10mH and 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

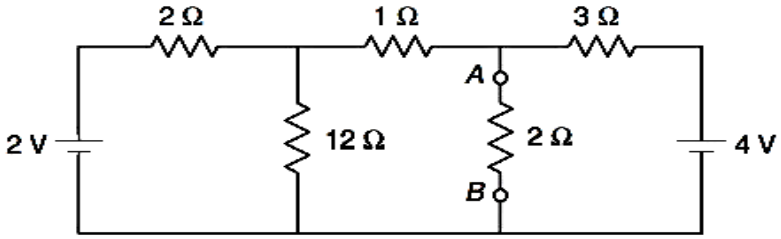


	b)	In the network shown, find the value of Z_L to which the maximum power can be delivered. Hence, find the value of the maximum power.	7 Marks	L3	CO3	PO5

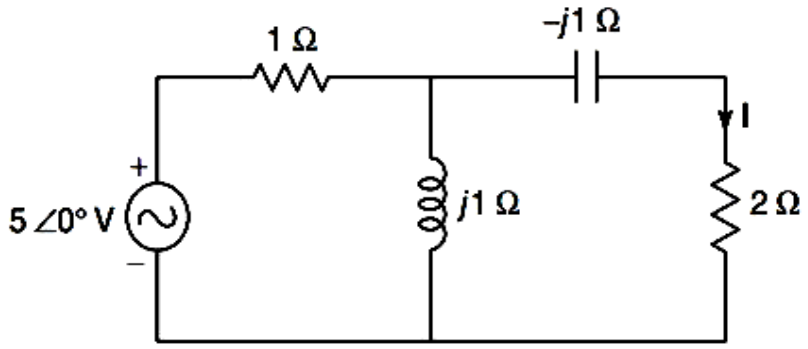


(OR)

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

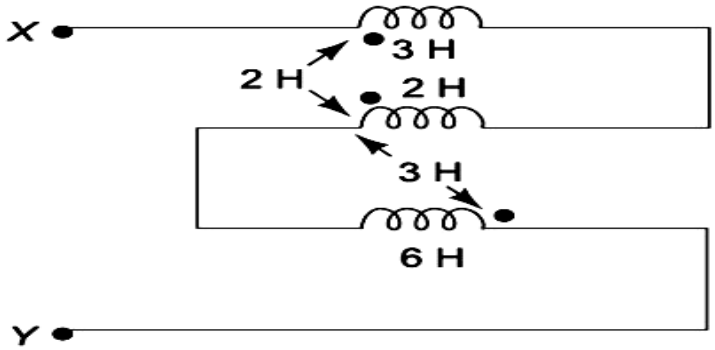
7.	a)	Show that power consumption, when three identical impedances are connected in delta across a balanced 3-phase supply, is three times that when the same impedances are connected in star across the same 3-phase supply.	7 Marks	L5	CO4	PO4
	b)	A balanced 3-phase, star-connected load of 100kW takes 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

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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

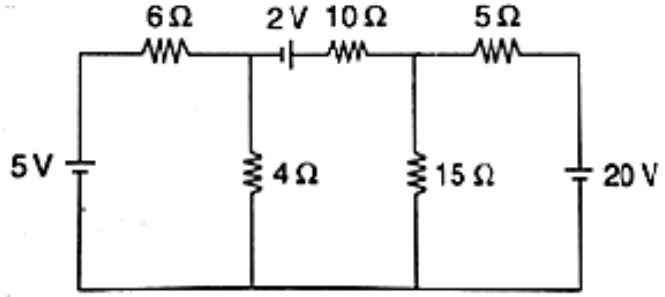
[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

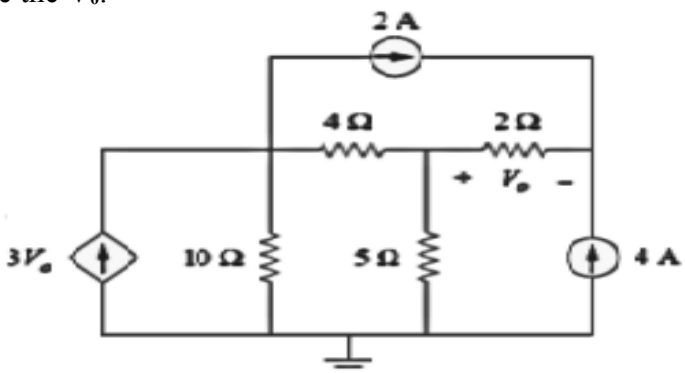
UNIT-I

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

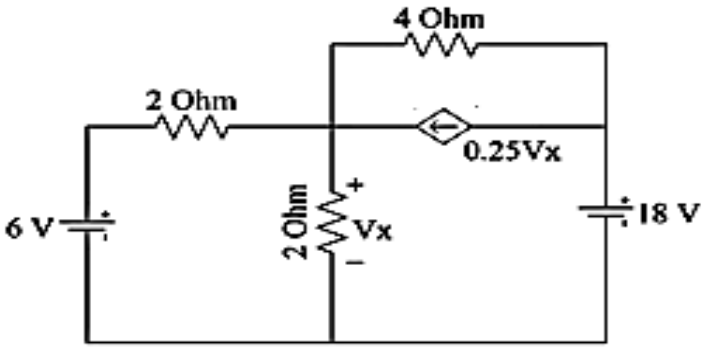


(OR)

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

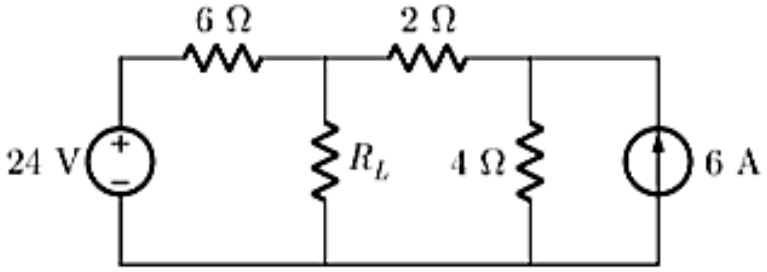
3.	a)	Derive expression for bandwidth of series resonance circuit.	7 Marks	L2	CO1	PO2
	b)	In a series RLC circuit with R = 10 Ω, L = 0.1 H and C = 50 μF, find resonant frequency, quality factor and band width.	7 Marks	L3	CO2	PO2

(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

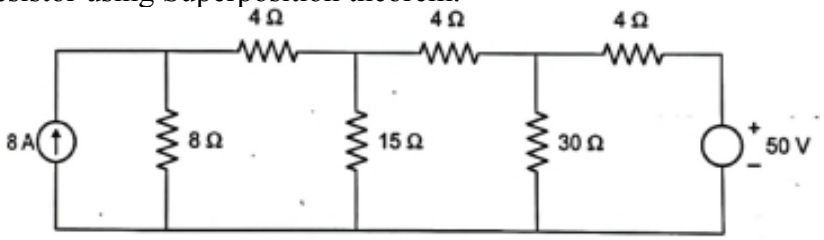
UNIT-III

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



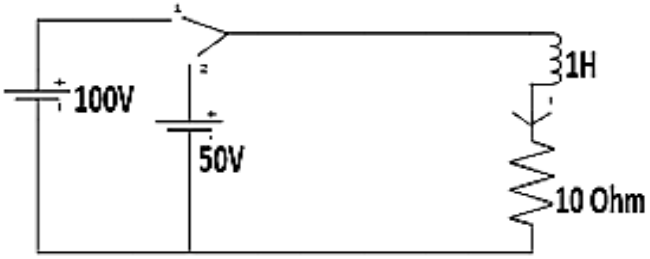
(OR)

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



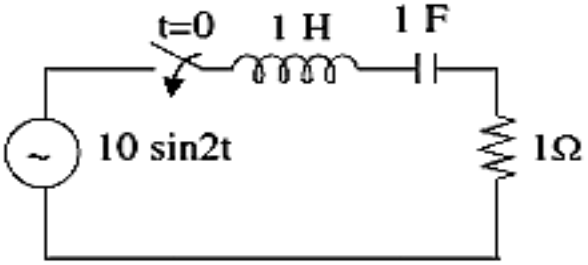
UNIT-IV

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

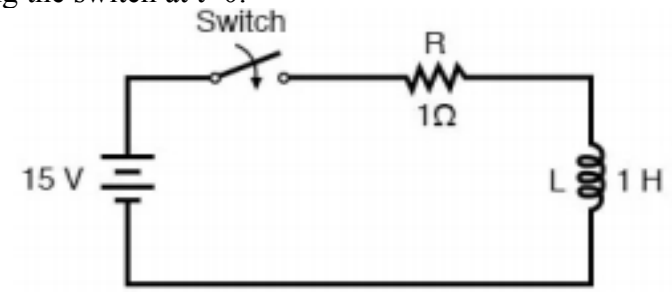


(OR)

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

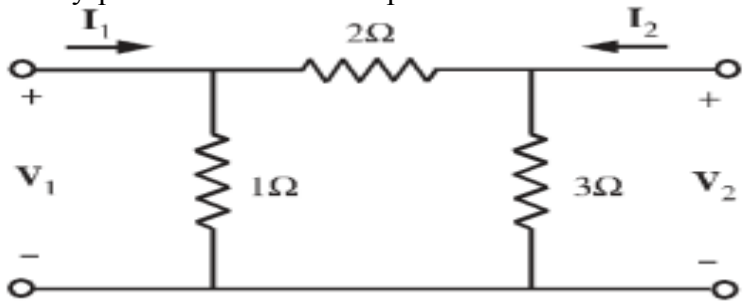


	b)	For the circuit shown below find the current in the circuit after closing the switch at t=0.	7 Marks	L4	CO1	PO2



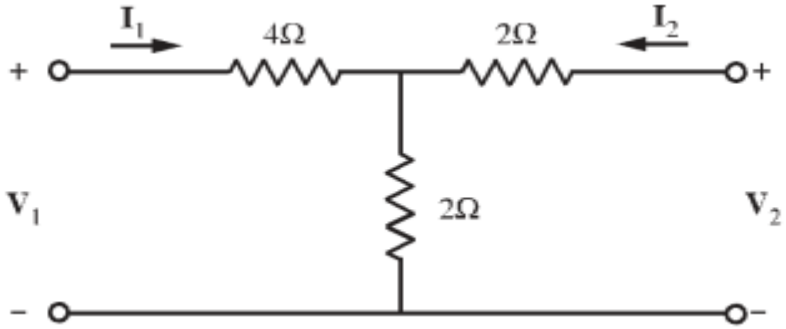
UNIT-V

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



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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

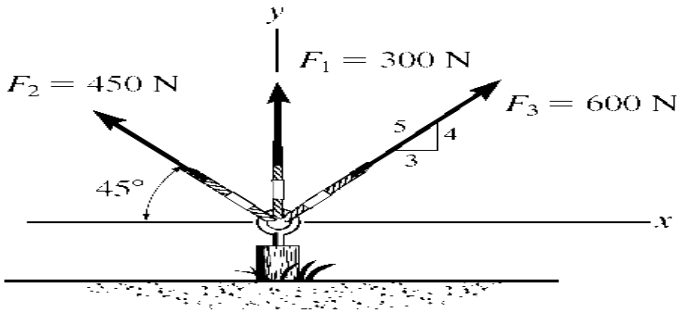
[Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

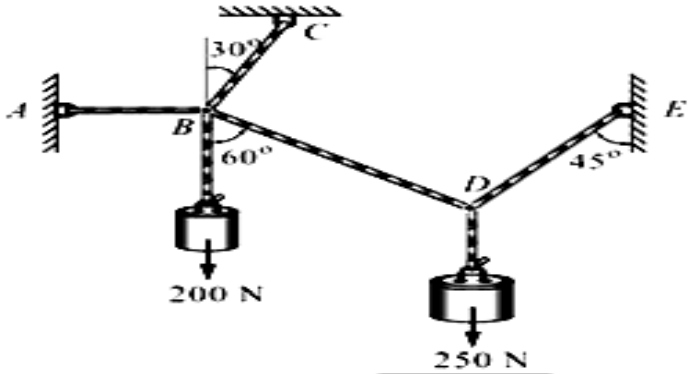
UNIT-I

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



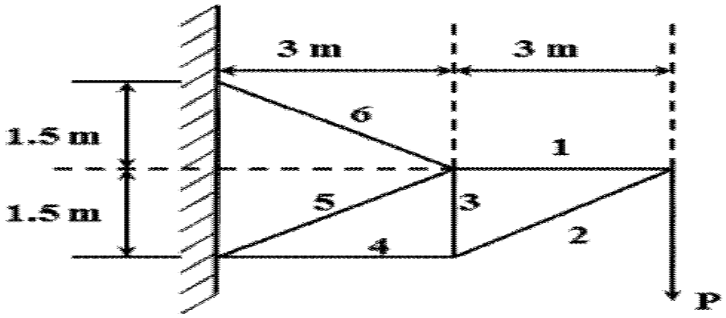
(OR)

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



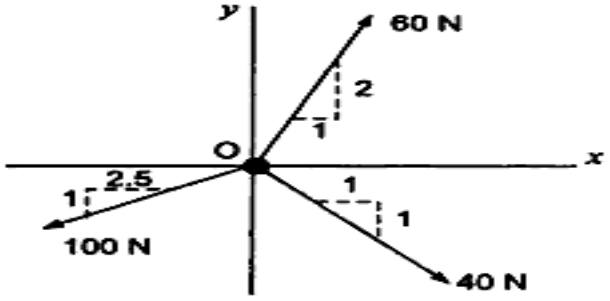
UNIT-II

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



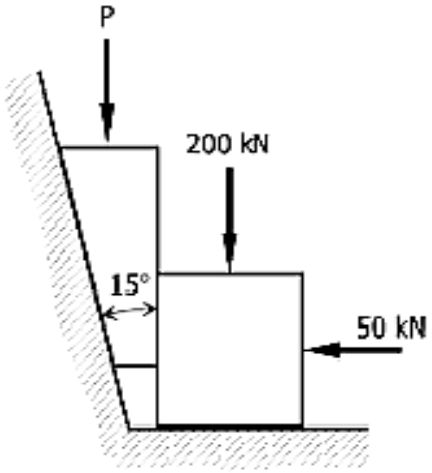
(OR)

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



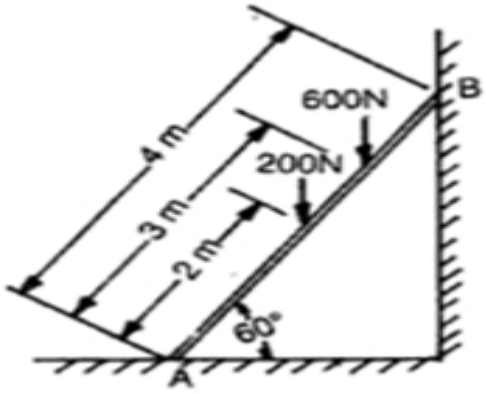
UNIT-III

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



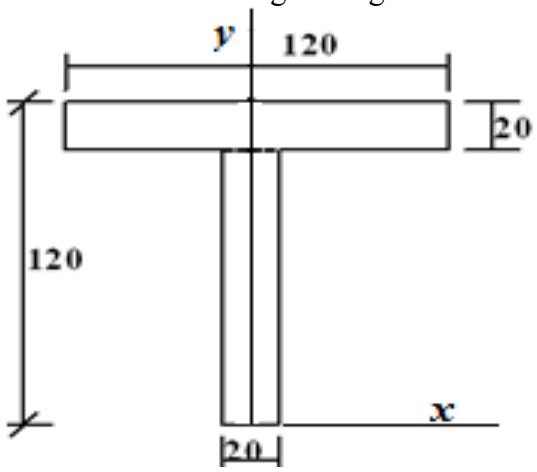
(OR)

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



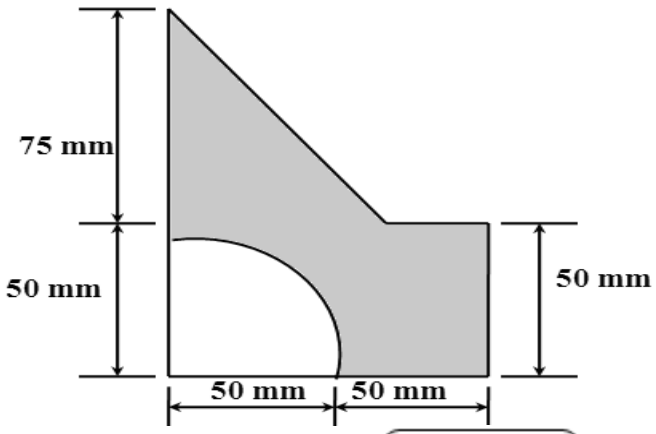
UNIT-IV

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

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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

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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

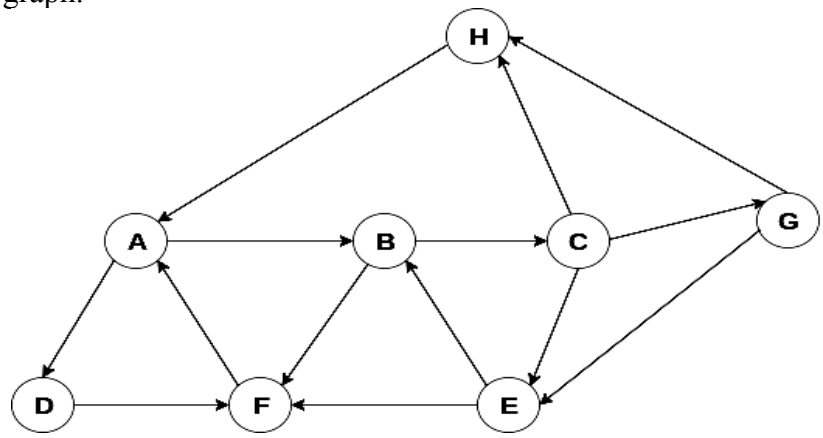
UNIT-IV

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

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

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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

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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

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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

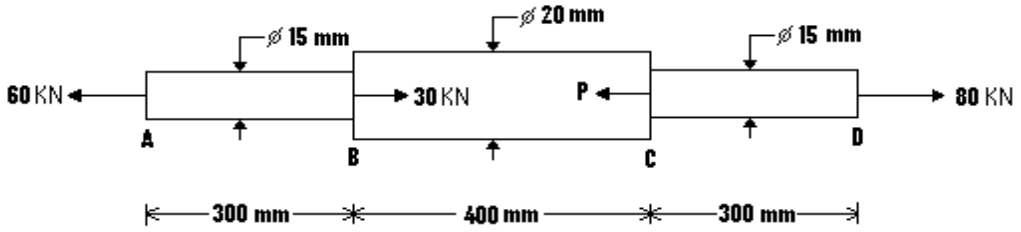

Fig.1.

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

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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 . — 14 Marks
i) Geometric Similarity. ii) Kinematic Similarity. iii) Dynamic Similarity.

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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

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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

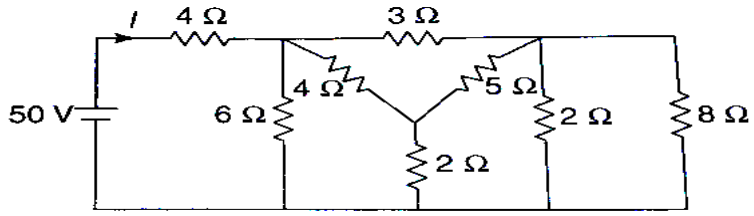

Fig.1

b) Determine the voltage drop across 5Ω resistor in fig. 2 using nodal analysis. 7 Marks

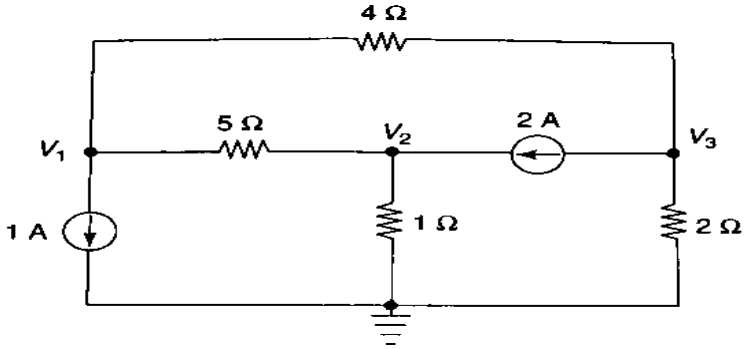

Fig. 2

(OR)

2 a) Determine the equivalent resistance between the terminals A and B for the network shown in fig. 3. 7 Marks

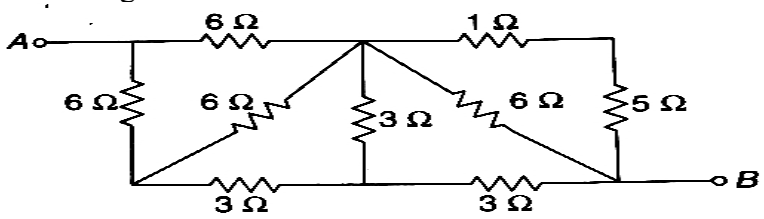

Fig. 3

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

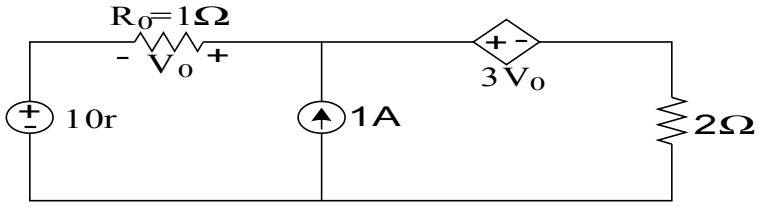

Fig.4

(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

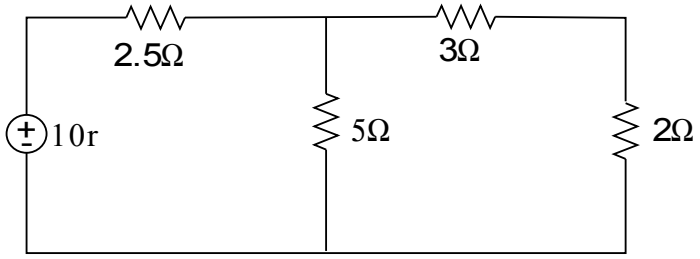

Fig.5

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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

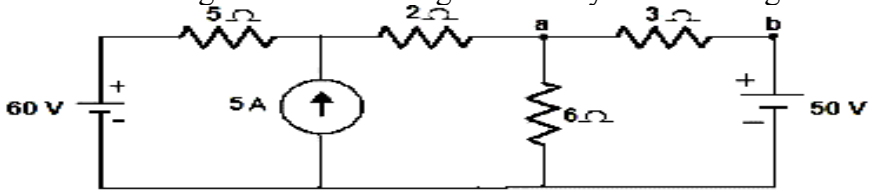

Figure.1

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

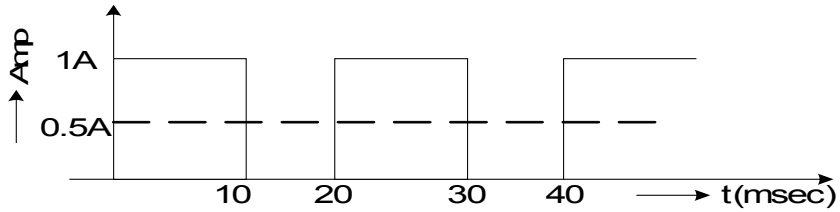

Figure.2

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

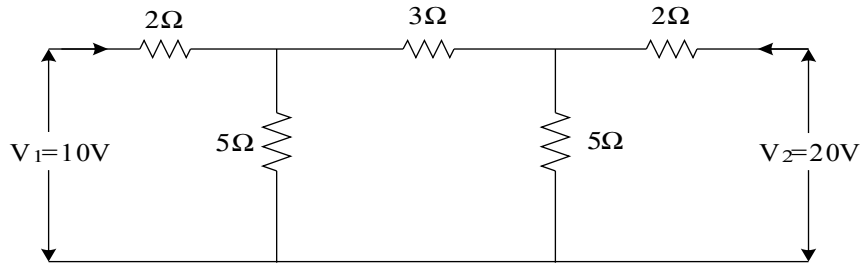

Figure.3

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

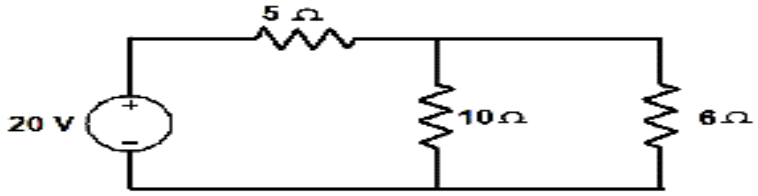

Figure.4

(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

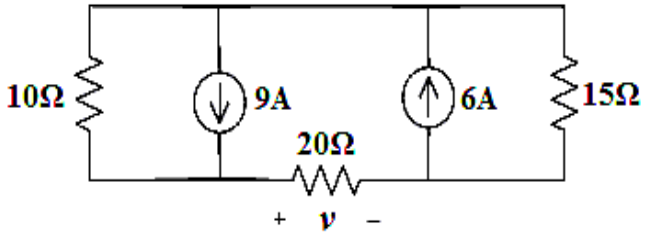

Figure.5

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

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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
$x + 2y - z = 3,\ 3x - y + 2z = 1,\ 2x - 2y + 3z = 2,\ x - y + z = -1$.

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
$3x + 2y + z = 0,\ 2x + 3z = 0,\ y + 3z = 0,\ x + 2y + 3z = 0.$

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 $x + \log_{10} x = 3.375$, 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

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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

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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

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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

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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

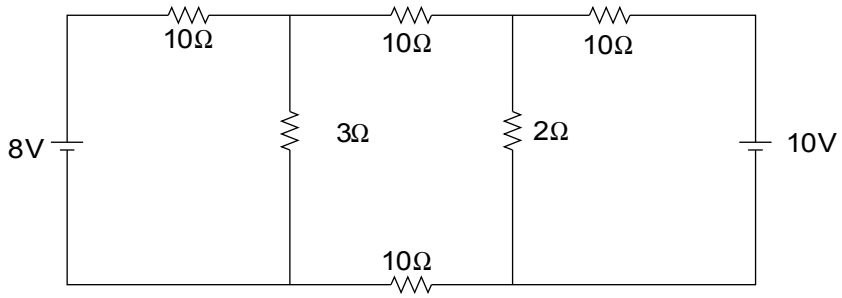

Fig.1b.

(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

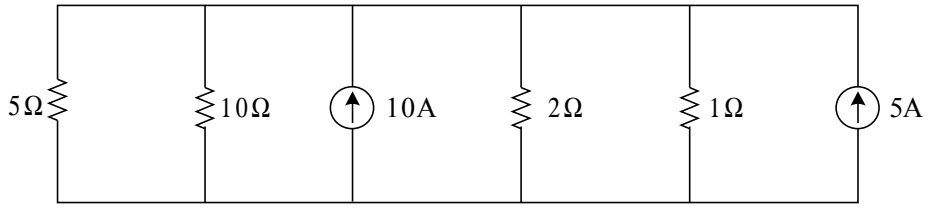

Fig.2b

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

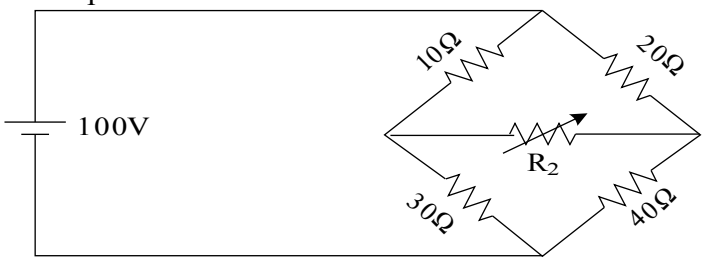

Fig. 9b.

(OR)

10 Obtain the thevenin equivalent for the bridge circuit shown in Fig.10. 14 Marks

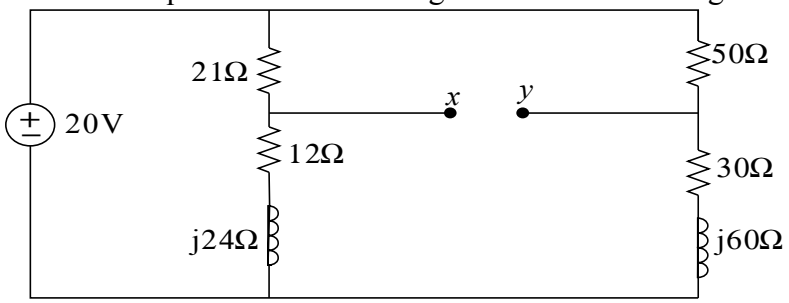

Fig.10.

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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 $B \subset A$ 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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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 ($\alpha = 0.05$).

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CODE No.: 16BT3BS02 SVEC-16

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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

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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

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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/-

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

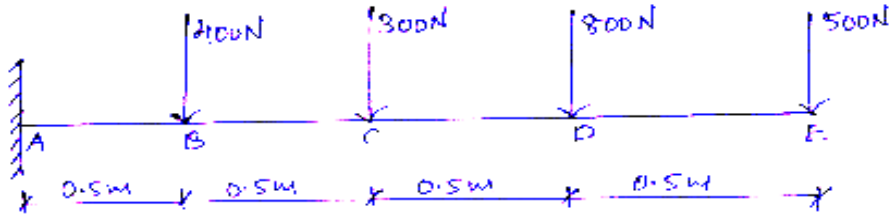
1		A compound bar consist of a central steel strip 25 mm wide and 6.4 mm thick placed between two strips of brass each 25 mm wide and 't' mm thick. The strips are firmly fixed together to form a compound bar of rectangular section 20 mm wide and (2t + 6.4) mm thick. Determine i) The thickness of the 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.	CO5	14 Marks

(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

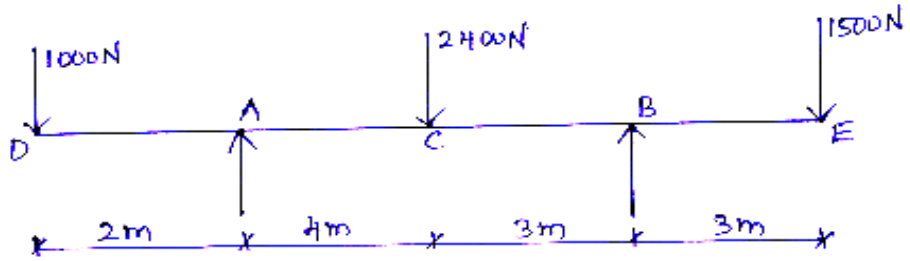
UNIT-II

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

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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

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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

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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

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CODE No.: 16BT30203 SVEC-16

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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**

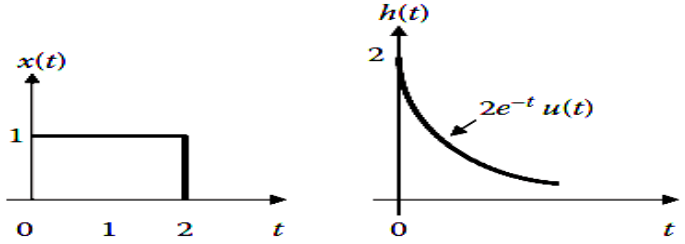
Answer One Question from each Unit
All questions carry equal marks

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

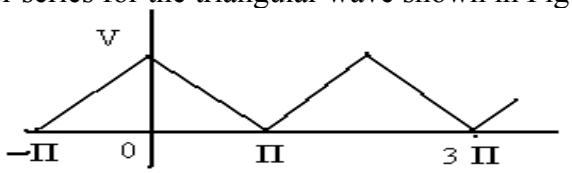
(OR)

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

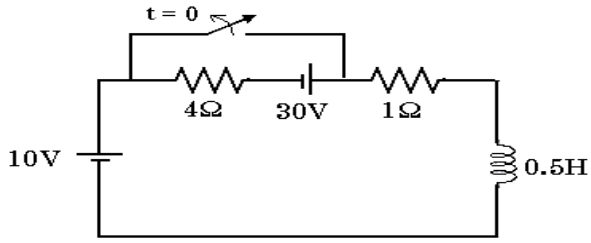


(OR)

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

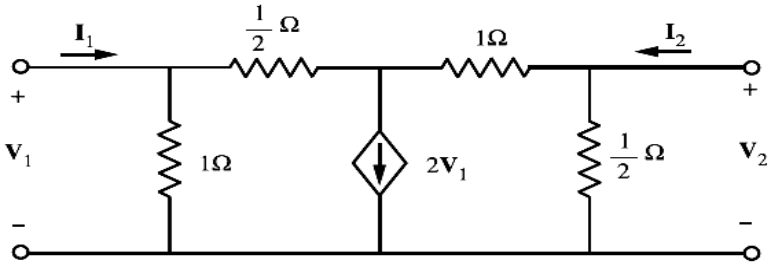


(OR)

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

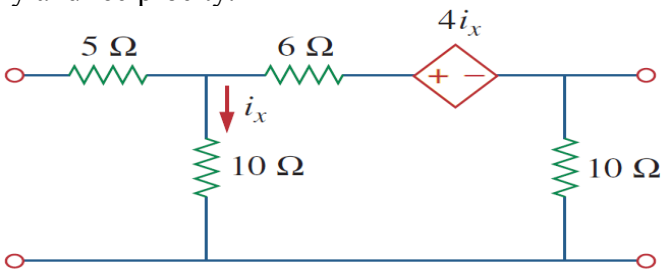
UNIT-IV

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

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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

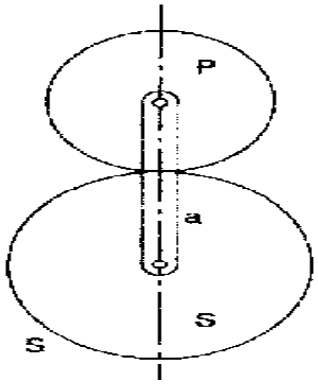
3		In a slider crank mechanism, the crank OB is 30mm and the connecting rod BC is 120mm long. The crank rotates at 300 r.p.m clockwise and makes 60^0 from IDC. Find i) The velocity of piston C. ii) Angular velocity of connecting rod BC.	CO2	14 Marks
		(OR)		
4		In a four bar mechanism PQRS, PS is fixed 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

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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

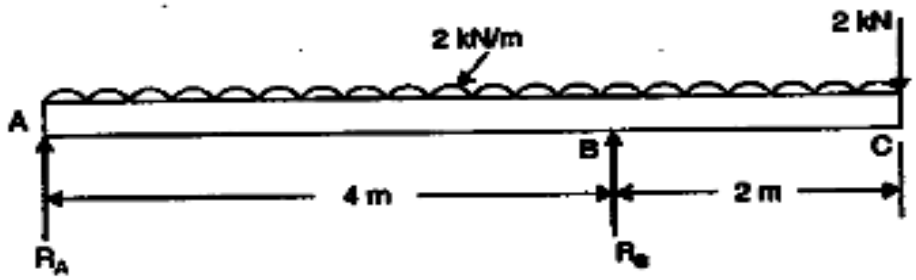

Fig.1

(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

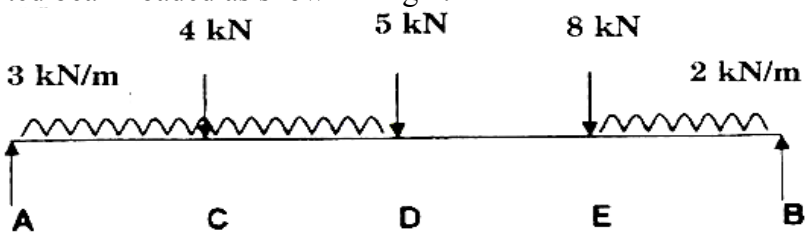

Fig.2

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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

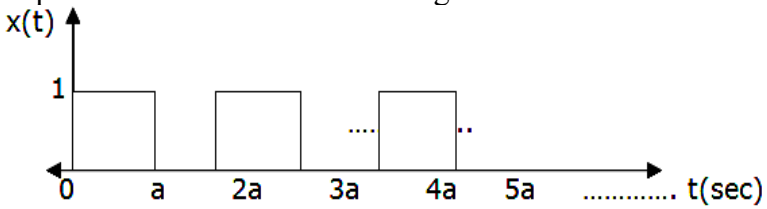
5	a)	A filter has an input $x(t)=e^{-2t}u(t)$ and transfer function, $H(W)=1/(1+jw)$. Find ESD of the output.	CO3	8 Marks
	b)	Discuss about the properties of convolution.	CO1	6 Marks

(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

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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

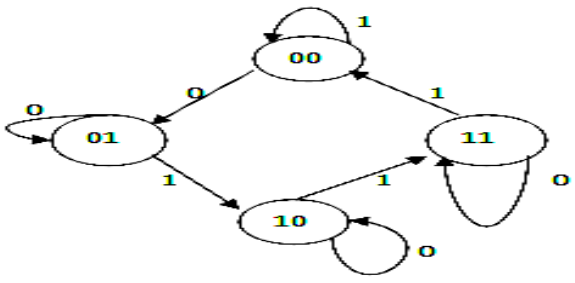
3	a)	Simplify the Boolean function using K-map in SOP forms. F=∑m(0, 1, 2, 4, 7, 8, 12, 14, 15, 16, 17, 18, 20, 24, 28, 30, 31).	CO2	7 Marks
	b)	Minimize the criterion the following using K-map. F(A, B, C, D).= Σm (0, 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 13).	CO3	7 Marks
		(OR)		
4	a)	Minimize the following 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

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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)

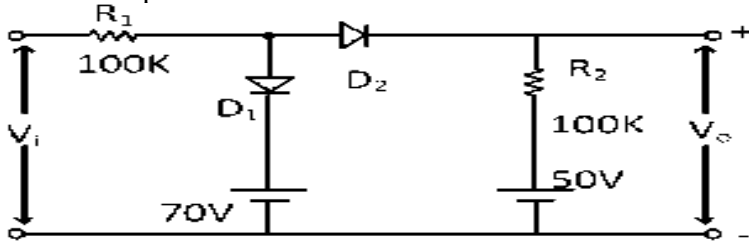
6	a)	Select an appropriate technique to get Minimum distortion in power amplifiers, compromising with efficiency.	CO5	7 Marks
	b)	Explain the operation of a Class-A power amplifier and derive the expression for maximum efficiency.	CO1	7 Marks

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

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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?		

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

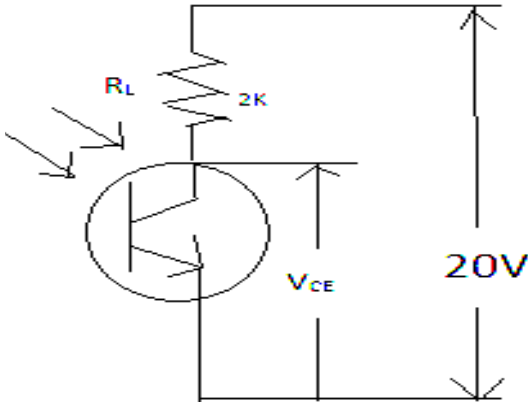
5		Describe the constructional details of a resistance potential divider and derive the expressions for its output voltage when connected across a meter of finite impedance.	CO1	14 Marks
		(OR)		
6		Explain with diagrams, the bonded and unbounded types of strain gauges. For bonded strain gauges, describe 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

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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

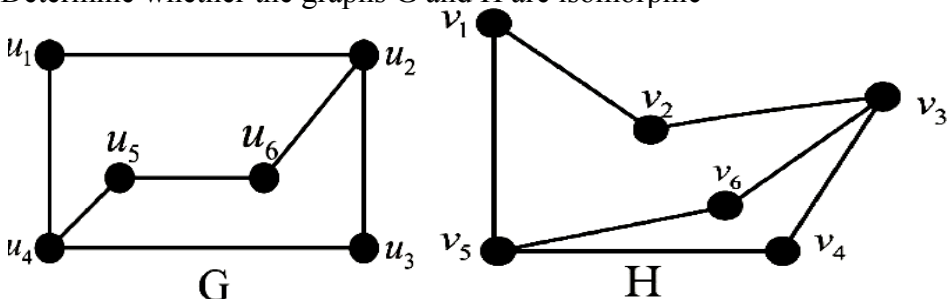
UNIT-IV

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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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.

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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.

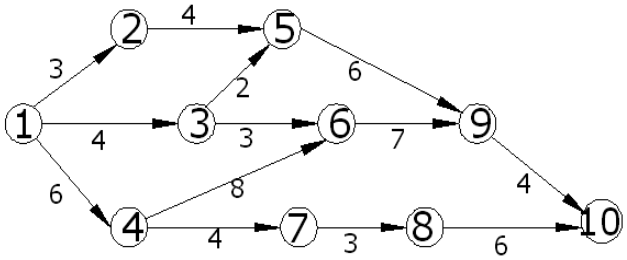
(OR)

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

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

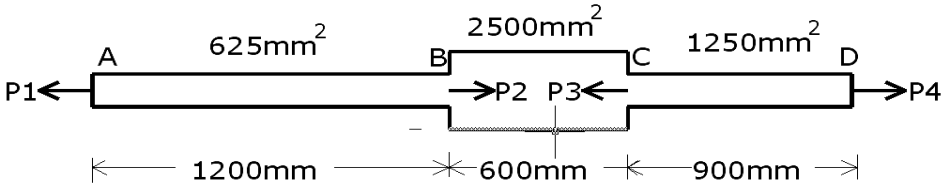
MECHANICS OF SOLIDS
[Civil Engineering]

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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

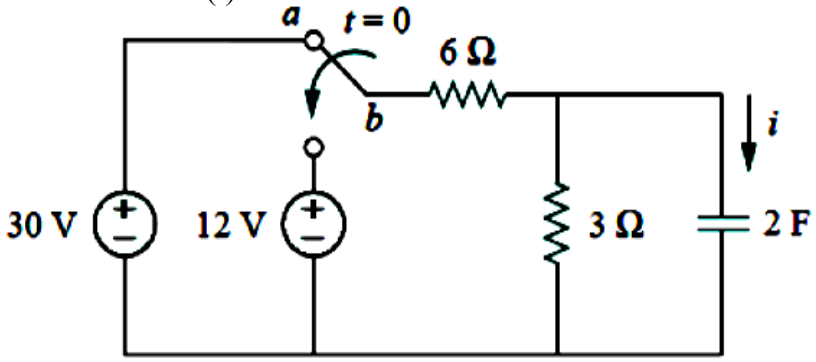
1	a)	Write about elementary continuous time signals in detail.	CO1	7 Marks
	b)	Determine whether the following systems are linear or not $dy(t)/dt + 3ty(t) = t2\,x(t)$ and $y(n) = 2x(n) + 1/x(n-1)$.	CO2	7 Marks
		(OR)		
2	a)	Find the impulse response of causal LTI systems described by the following differential 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

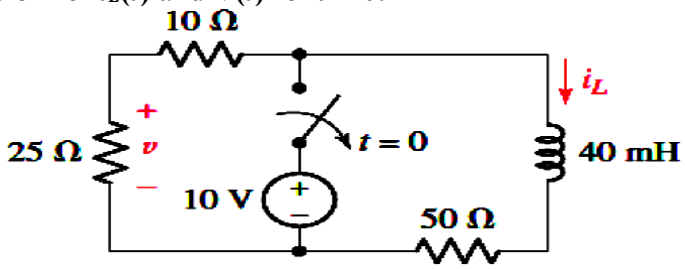
UNIT-III

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)		

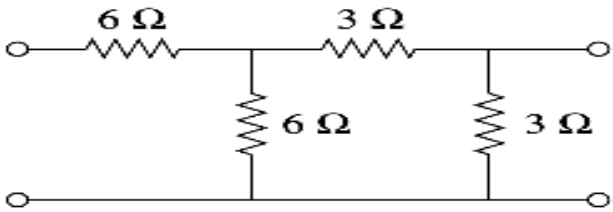
6	a)	The switch is closed for longer time. At t equal to 0 it is opened. Obtain the expression for $i_L(t)$ and $v(t)$ for $t > 0$.	CO4	7 Marks



	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

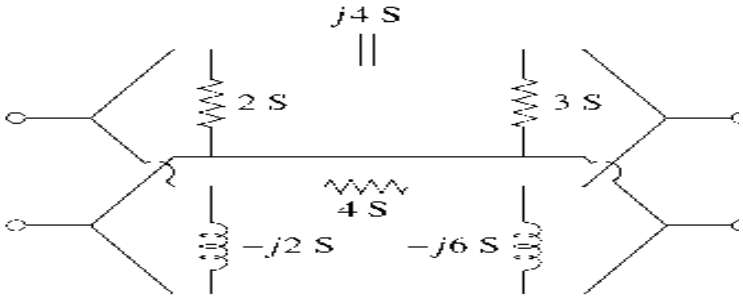
7	a)	Calculate the Y parameters for the two port network shown below.	CO4	7 Marks



	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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

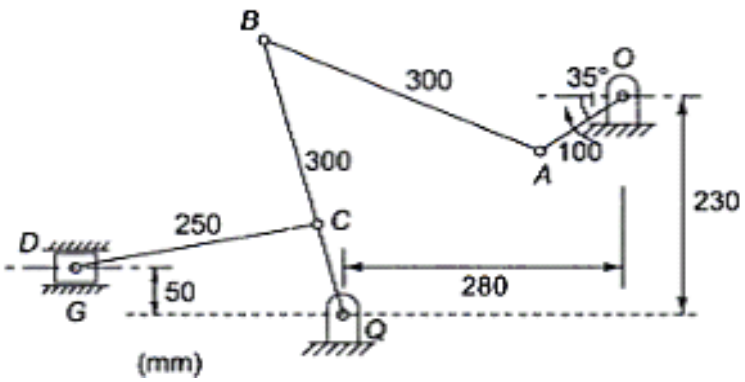
1	a)	What are quick-return mechanisms? Where are they used? Discuss the functioning of any one of them.	CO1	7 Marks
	b)	Distinguish between: i) Mechanism and Machine. ii) Analysis and Synthesis of mechanisms. iii) Kinematics and dynamics.	CO2	7 Marks

(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

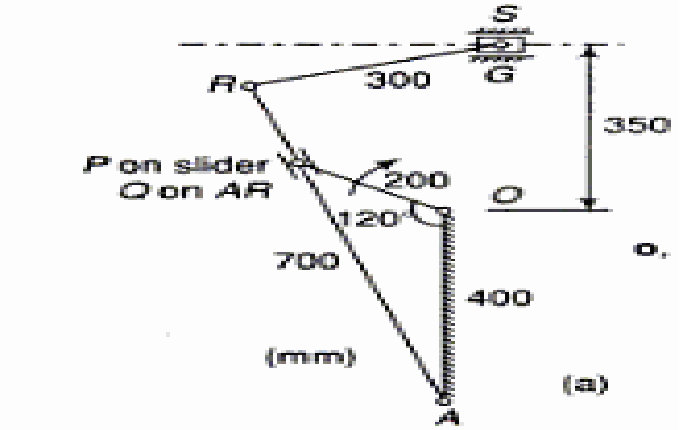
UNIT-II

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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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**

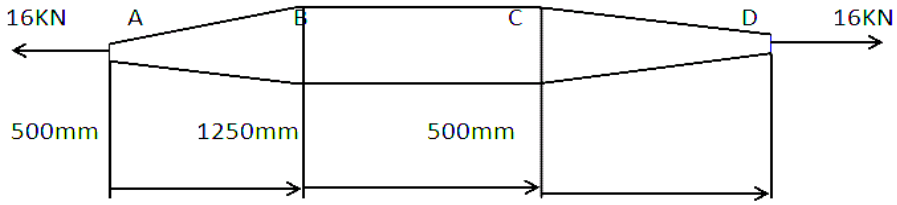
Answer One Question from each Unit
All questions carry equal marks

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

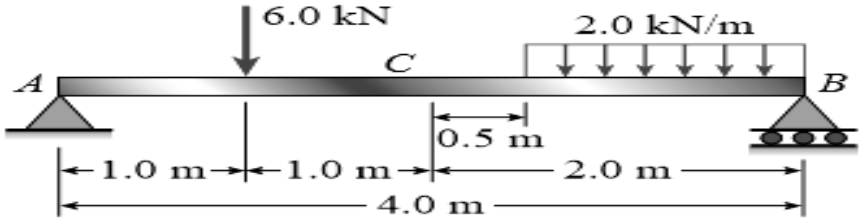


Fig. 1.

(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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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)

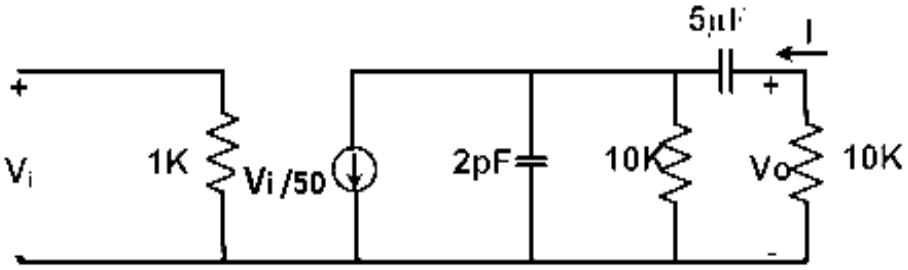
2 a) What are the important characteristics of a cascade amplifier? Draw the circuit of CE-CC cascade amplifier and determine an expression for its voltage gain in terms of its circuit parameters. CO2 7 Marks

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 CO1 8 Marks
   i) Gain sensitivity.
   ii) Bandwidth extension.
   iii) Linearizing effect.

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

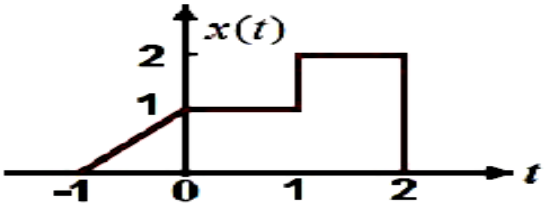
SIGNALS AND SYSTEMS

[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

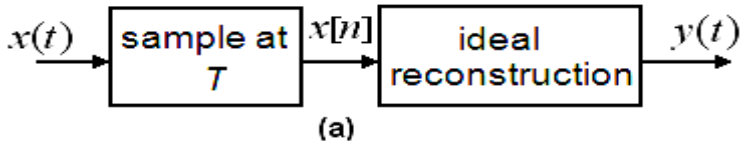
(OR)

8 a) Explain properties of ROC in Laplace transform. CO1 7 Marks

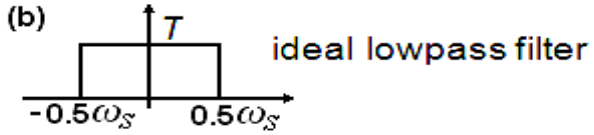
b) Find the Laplace transform of $\boldsymbol{x(t) = t^2 e^{-2t} u(t)}$. CO3 7 Marks

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 $|X_s(\Omega)|$ 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. CO4 7 Marks

i) $\boldsymbol{x[n]=n(1/3)^n u[n]}$

ii) $\boldsymbol{x[n] = (1/4)^{n+1} u[n-2]}$

b) Determine the inverse ZT of the sequence $X[z] = \frac{1-2z^{-1}}{1+\frac{1}{2}z^{-1}}$, if $x(n)$ is: CO4 7 Marks

i) Causal sequence. ii) Anti causal sequence.

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CODE No.:16BT30403 SVEC-16

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

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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

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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

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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**

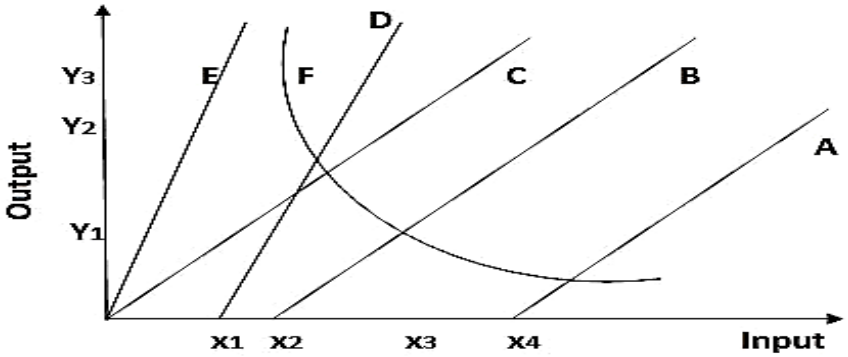
Answer One Question from each Unit
All questions carry equal marks

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: $\mathbf{P \vee (\sim P \wedge Q) \Leftrightarrow (P \vee Q).}$	CO1	7 Marks
	b)	Show that $S \vee R$ is tautologically implied by $\mathbf{(P \vee Q) \wedge (P \rightarrow R) \wedge (Q \rightarrow S).}$	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 $(a.b)^2 = a^2 . b^2$ $\forall$ a,b ε G then (G, .) is abelian.	CO5	7 Marks
	b)	State and Prove Lagranges theorem.	CO5	7 Marks

UNIT-IV

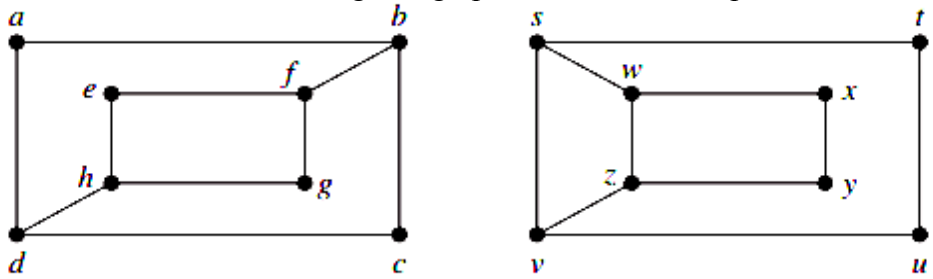
7	a)	Prove by using Mathematical Induction, (x-y) divides $(x^n - y^n)$, $\forall$ n $\geq$ 1.	CO1	7 Marks
	b)	i) How many different license plates are there (allowing repetitions), that involve 1, 2 or 3 letters followed by 1, 2, 3 or 4 digits. ii) Involving 1, 2 or 3 letters and 1, 2, 3 or 4 digits if the letters must occur together.	CO5	7 Marks

(OR)

8	a)	Solve the Reccurence Relation $\mathbf{F_n = F_{n-1} + F_{n-2}}$, n $\geq$ 2 and $F_0 = F_1 = 1$.	CO1	7 Marks
	b)	Solve the Reccurence Relation $\mathbf{a_n - 6a_{n-1} + 8a_{n-2} = n.4^n}$.	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

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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.: 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

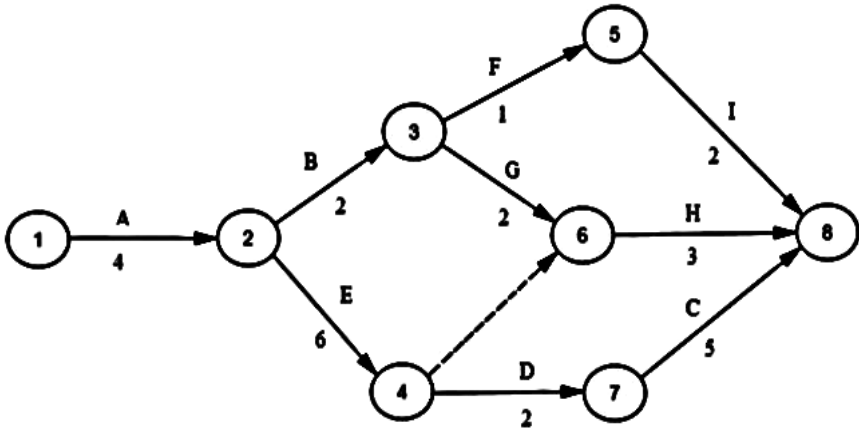
Draw the PERT network for the project.

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

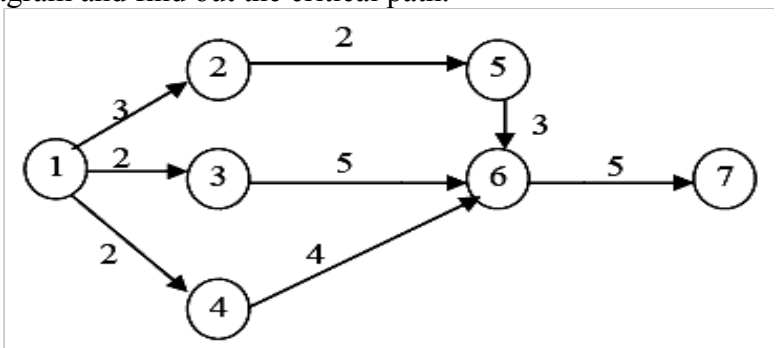
b) Determine the total float, free float for the following network diagram and find out the critical path. 6 Marks L5 CO5 PO1 PO2 PO5



(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



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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

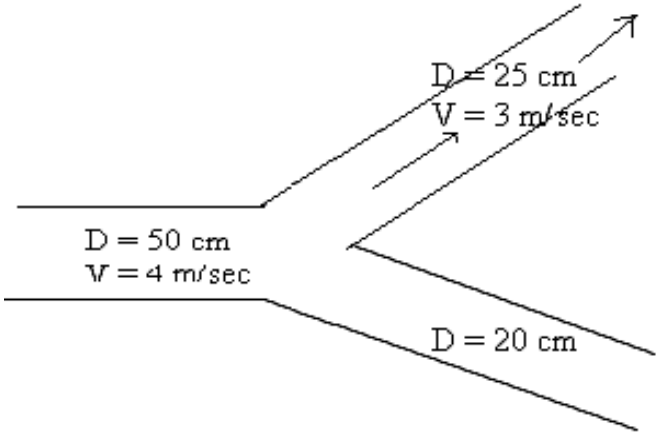
1.	a)	Determine the intensity of shear of an oil having viscosity = 1 poise. The oil is used for lubricating the clearance between a shaft diameter 10cm and its journal bearing. The clearance is 1.5mm and the shaft rotates at 150 r.p.m.	6 Marks	L4	CO1	PO1 PO4 PO5 PO10
	b)	Calculate the density, specific 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 $V = 4x^3\bar{i} - 10x^2y\bar{j} + 2t\bar{k}$. 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

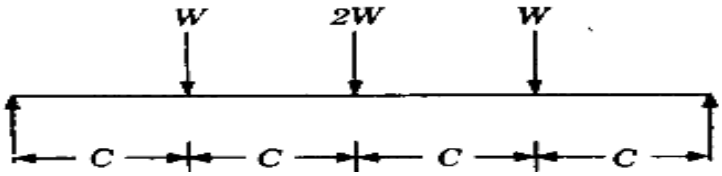
[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

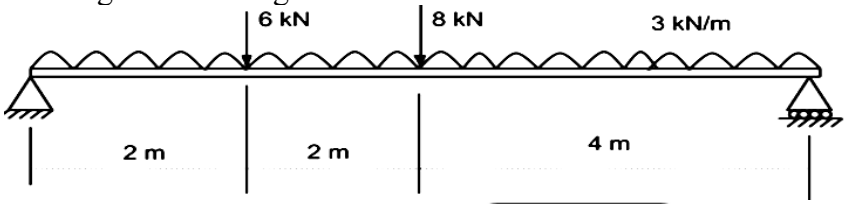
UNIT-I

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.				



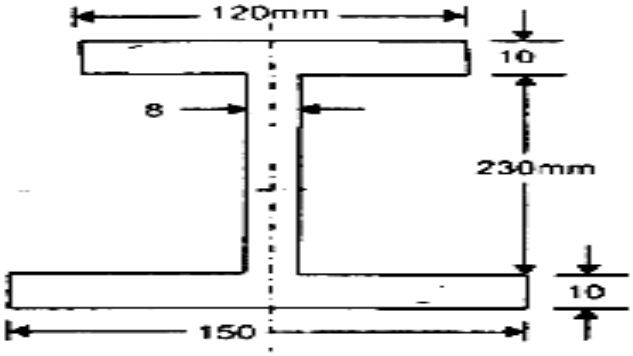
(OR)

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

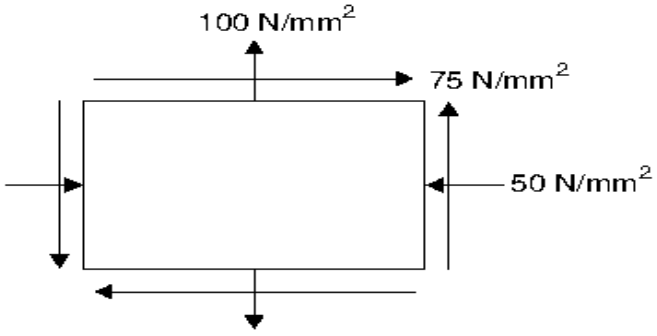
UNIT-III

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 (**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 $E = 20\cos(\omega t - 50x)a_y V/m$, 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

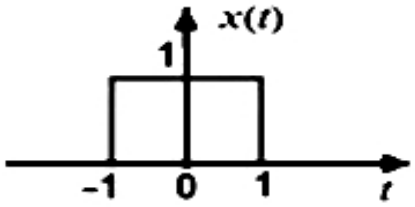
[Electrical and Electronics Engineering]

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

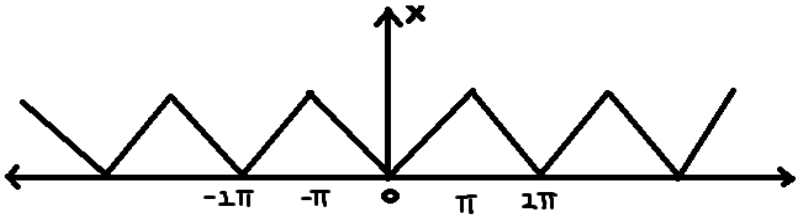


(OR)

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

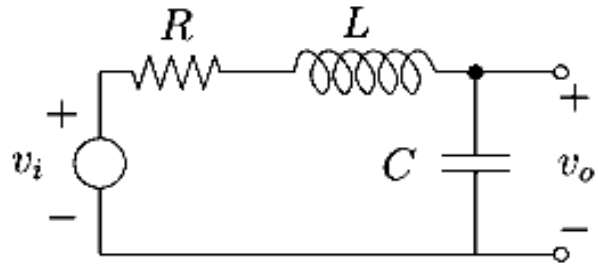
5.	a)	Find the Laplace transform and ROC of the signal $-e^{-at}u(-t)$.	6 Marks	L3	CO2	PO5
	b)	Find the inverse Laplace transform of the $X(s) = \dfrac{2s+1}{(s+1)(s^2+2s+2)}$.	6 Marks	L3	CO2	PO5

(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 $X[z] = \dfrac{2-\frac{3}{2}z^{-1}}{1-\frac{3}{2}z^{-1}+\frac{1}{2}z^{-2}}$ *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

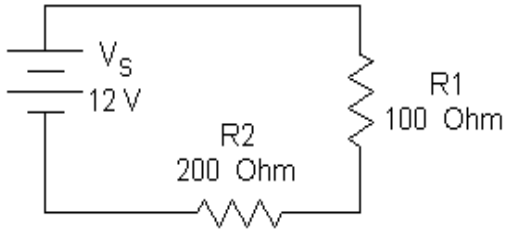


i) Find the system equation (ODE) which relates $v_i(t)$ *with* $v_0(t)$.
ii) Determine transfer function H(s).
iii) Draw magnitude response $\|H(j\omega)\|$.

	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)

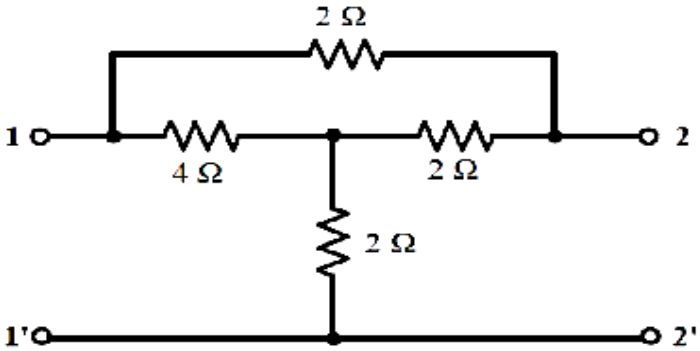
8.	a)	Differentiate RL and RC circuits	4 Marks	L2	CO3	PO1
	b)	For the electrical network shown below, answer the following	8 Marks	L3	CO3	PO2



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

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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

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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

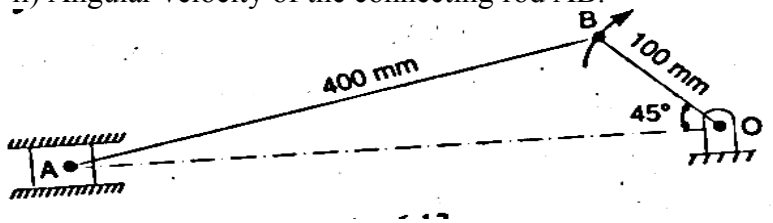
UNIT-IV

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

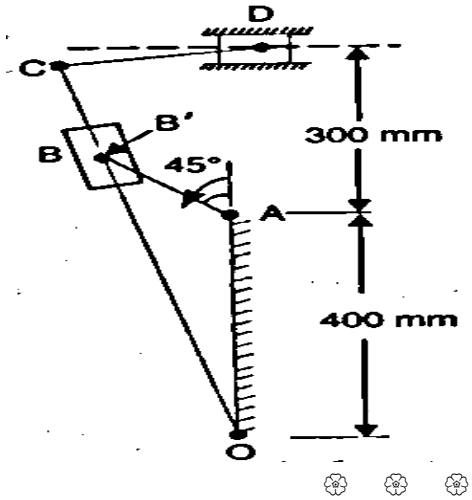
UNIT-V

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



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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

STRENGTH OF MATERIALS
[Mechanical Engineering]

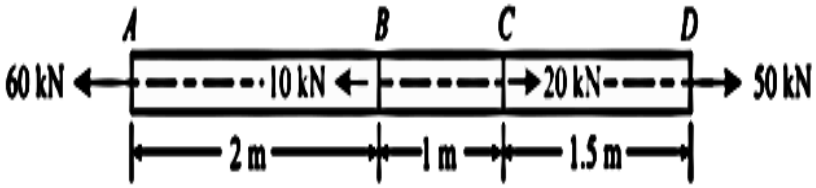
Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

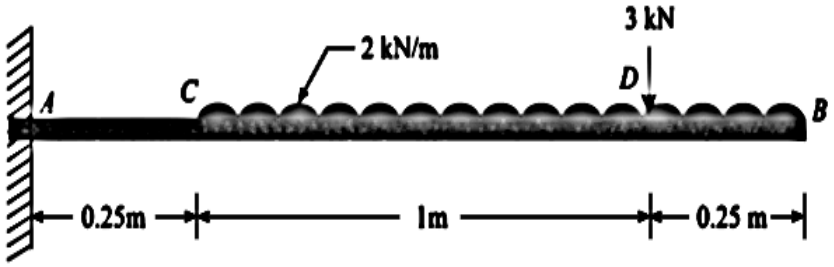
UNIT-I

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

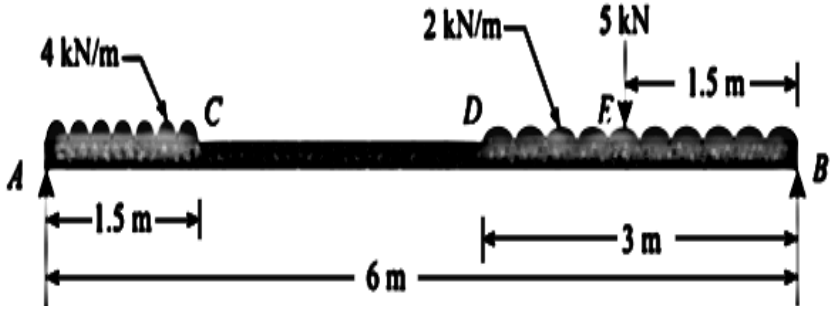
(OR)

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)

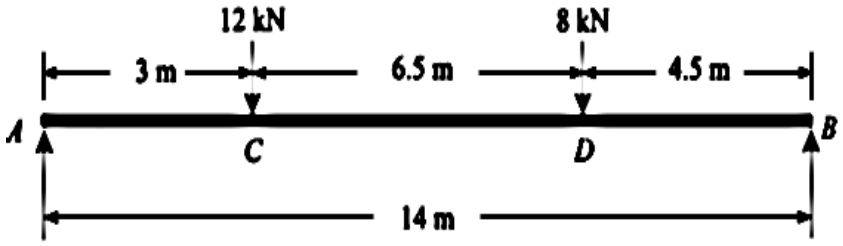
8.	a)	A short cast iron column of cross sectional area **4cm^2** carries an axial compressive load of **250kN**. For a plane inclined at **60^0** with the direction of the load, calculate the normal, the tangential and the resultant stresses and also the maximum shear stress and the obliquity of the 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



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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

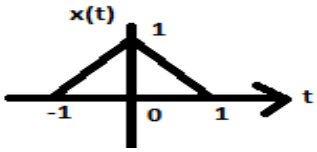
1.	a)	Illustrate the following classifications of continuous time sequences with examples. i) Static and Dynamic systems. ii) Time variant verses and Time in-variant systems.	6 Marks	L1	CO1	PO2
	b)	Given a signal. x(t)= t+2 -2 < t < 2 = 0 otherwise. Plot the following signals x(2t), x(-t), x(t/2), 2 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

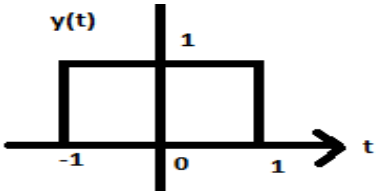
UNIT-II

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 August – 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) Using method of false position, estimate an approximate root correct to three decimal places for the equation $\mathbf{x^3 - x - 4 = 0}$. — 6 Marks L3 CO1 PO2

   b) Derive a recurrence formula for evaluating $\sqrt{N}$ by Newton-Raphson method and hence estimate $\sqrt{10}$ correct to three decimal places. — 6 Marks L3 CO1 PO1

(OR)

2. a) Construct an interpolating polynomial for the following data using Newton's forward formula. — 6 Marks L3 CO1 PO1

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. — 6 Marks L5 CO1 PO1

x	5	6	9	11
y	12	13	14	16

UNIT-II

3. a) Estimate $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ for $x = 1.2$ from the following table of values of x and y. — 6 Marks L5 CO1 PO2

x	1.0	1.2	1.4	1.6	1.8	2.0	2.2
y	2.7183	3.3201	4.0552	4.9530	6.0496	7.3891	9.0256

   b) State Simpson's 3/8 rule and applying it to evaluate $\int_0^{\frac{1}{2}} \frac{1}{\sqrt{1-x^2}}\,dx$ for $n = 6$. — 6 Marks L1 CO1 PO1

(OR)

4. a) Solve $y' = x - y^2$, $y(0) = 1$ using Taylor's series method and compute $y(0.1)$, $y(0.2)$. — 6 Marks L3 CO1 PO2

   b) Apply the fourth order Runge-Kutta method to find $y(0.1)$ and $y(0.2)$, given $y' = xy - y^2$, $y(0) = 1$. — 6 Marks L3 CO1 PO1

UNIT-III

5. a) If X and Y are discrete random variables and K is a constant, show that: — 6 Marks L1 CO2 PO1

   i) E(X+K) = E(X)+K
   ii) E(X+Y) = E(X) +E(Y).

	b)	A continuous variable X has the distribution function $F(x) = \begin{cases} 0, & if\ x \le 1 \\ K(x-1)^4, & if\ 1 < x \le 3 \\ 1, & if\ x > 3 \end{cases}$ Determine : i) the probability density functions of X ii) K.	6 Marks	L3	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 losses *Rs.*1500 if 3 tails occur. Estimate the expected gain of the player.	6 Marks	L5	CO2	PO2
	b)	Show that variance of a random variable X is given by $\sigma^2 = E(X^2) - [E(X)]^2$.	6 Marks	L1	CO2	PO1
		UNIT-IV				
7.	a)	Average number of accidents on any day on a national highway is 1.8. Determine the probability that the numbers of accidents is: i) at least one ii) at most one.	6 Marks	L3	CO2	PO2
	b)	In a sample of 1000 cases, the mean of a certain test is 14 and standard deviation is 2.5. Assuming the distribution to be normal, find i) how many students score between12 and 15. ii) how many score above 18. iii) how many score below 18.	6 Marks	L1	CO2	PO1
		(OR)				
8.	a)	Construct a binomial distribution to the following data and find the expected frequencies.	6 Marks	L3	CO2	PO1

x	0	1	2	3	4	5	6
$f(x)$	13	25	52	58	32	16	4

	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.	6 Marks	L5	CO2	PO2
		UNIT-V				
9.	a)	Explain about : i) Null hypothesis ii) Type-I and type-II errors.	6 Marks	L2	CO2	PO1
	b)	A random sample of size 16 values from a normal population showed a mean of 53 and a sum of squares of deviations from the mean equals to 150. Test whether the sample is taken from the population having mean 56.	6 Marks	L4	CO2	PO4
		(OR)				
10.	a)	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 the men in this city are smokers? Analyze the given information and conclude.	6 Marks	L4	CO2	PO4
	b)	Four methods are under development for making discs of a super conducting material. Fifty discs are made by each method and they are checked for super conductivity when cooled with liquid.	6 Marks	L4	CO2	PO4

	1st Method	**2nd Method**	**3rd Method**	**4th Method**
Super conductors	31	42	22	25
Failures	19	8	28	25

Test the significant difference between the proportions of conductors at 0.05 level.

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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 August – 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)	Establish the recurrence relation of Gamma function and hence show that Γ(n+1) = n!, where *n* is a positive integer.	6 Marks	L1	CO1	PO1
	b)	Define Beta function and show that $\beta(m,n) = \int_0^\infty \frac{x^{m-1}}{(1+x)^{m+n}} dx$.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Show that $\Gamma(n) = \int_0^\infty \left[\log\frac{1}{x}\right]^{n-1} dx$.	6 Marks	L1	CO1	PO1
	b)	From the definition of Beta function, establish the relation $\beta(m,n) = \beta(m+1, n) + \beta(m, n+1)$.	6 Marks	L2	CO1	PO2

UNIT-II

3.	a)	Express $J_4(x)$ in terms of $J_0(x)$ and $J_1(x)$.	6 Marks	L2	CO1	PO2
	b)	Show that $5x^3 = 2P_3(x) + 3P_1(x)$.	6 Marks	L2	CO1	PO2
		(OR)				
4.	a)	Prove that $\frac{d}{dx}[xJ_1(x)] = xJ_0(x)$.	6 Marks	L1	CO1	PO1
	b)	Establish the relation $J_0^2(x) + 2\left[J_1^2(x) + J_2^2(x) + J_3^2(x) + ...\right] = 1$ where $J_n(x)$ denotes the Bessel function of order *n*.	6 Marks	L1	CO1	PO1

UNIT-III

5.	a)	By Milne-Thomson method , construct an analytic function $f(z) = u + iv$ where $v = \frac{2\sin x \sin y}{\cos 2x + \cosh 2y}$.	6 Marks	L3	CO2	PO2
	b)	Find the image of the ring shaped region $1 < \lvert z\rvert < 2$ under the transformation $w = 2iz + 1$.	6 Marks	L2	CO2	PO1
		(OR)				
6.	a)	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.	6 Marks	L2	CO2	PO1
	b)	State Cauchy's Integral theorem and applying it show that $\int_C \frac{dz}{z^2(z^2+16)} = 0$ where $C: 1 \le \lvert z\rvert \le 2$.	6 Marks	L2	CO2	PO1

UNIT-IV

7.		Analyzing the function $f(z) = \frac{7z - 2}{(z+1)(z)(z-2)}$, identify the regions in which the function can be expanded in Laurent series and expand it about point z = -1.	12 Marks	L3	CO2	PO2
		(OR)				
8.	a)	If $f(z)$ is analytic in the region R and let P and Q be any two points in the region then show that $\int_P^Q f(z)dz$ is independent of the path joining P and Q.	6 Marks	L1	CO2	PO1
	b)	Construct a Taylor's series for $f(z) = \frac{e^2}{z(z+1)}$ about the point z = 2.	6 Marks	L2	CO2	PO2

UNIT-V

9.		By using complex variable technique, evaluate $\int_{-\infty}^{\infty} \frac{x^2}{(x^2+1)(x^2+4)} dx$.	12 Marks	L3	CO2	PO2
		(OR)				
10.		Show that $\int_0^{\infty} \frac{\cos mx}{(x^2+a^2)^2} dx = \frac{\pi}{4a^3}(1+ma)e^{-ma}$ (a > 0) by the technique of complex variable.	12 Marks	L3	CO2	PO2

CODE No.: 19BT30101 SVEC-19

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations August - 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)	What is bond with regard to brick masonry? Mention its types and explain.	6 Marks	L1	CO1	PO1 PO10
	b)	Write short note on: i) Doglegged stairs. ii) Open newel half turn stairs.	6 Marks	L1	CO1	PO1 PO10
		(OR)				
2.	a)	List the types of arches and describe briefly.	6 Marks	L2	CO1	PO1 PO2 PO10
	b)	Describe queen post truss with neat sketch.	6 Marks	L2	CO1	PO1 PO10

UNIT-II

3.	a)	What is pointing? How is it carried out? What are its different types?	6 Marks	L3	CO2	PO1 PO5
	b)	Illustrate the different types of paints and describe the process of painting on new wood.	6 Marks	L3	CO2	PO1 PO5 PO7
		(OR)				
4.	a)	Define formwork and elucidate the chief requirements of a good formwork.	6 Marks	L2	CO2	PO1 PO5 PO8
	b)	What is shoring? Discuss different methods of shoring and state the safety precautions.	6 Marks	L2	CO2	PO1 PO5 PO6

UNIT-III

5.	a)	Discuss the different factors leading to accidents in construction projects.	6 Marks	L2	CO3	PO1 PO2 PO6
	b)	Explain ABC classification of materials and inventory of materials.	6 Marks	L4	CO3	PO1 PO2 PO5
		(OR)				
6.	a)	List out of the salient features of Minimum Wages Act of 1948 and Workman compensation act of 1923.	6 Marks	L2	CO3	PO1 PO6 PO8
	b)	Distinguish between line and functional organization.	6 Marks	L4	CO3	PO1 PO2 PO5 PO11

UNIT-IV

7.	a)	Write a short note on project planning, scheduling and controlling.	6 Marks	L2	CO4	PO1 PO11
	b)	Discuss various rules for providing dummies in a network and what are redundant dummies.	6 Marks	L3	CO4	PO1 PO2 PO6 PO10

(OR)

8.	a)	Write down the steps involved in the development of bar chart.	6 Marks	L1	CO4	PO1 PO5
	b)	Define work breakdown structure and draw a typical WBS tree diagram for residence building construction.	6 Marks	L2	CO4	PO1 PO5 PO10 PO11

UNIT-V

9.	a)	Define the terms. i) Slack. ii) Total Float. iii) Free Float. iv) Critical Path. v) Independent Float. vi) Interfering Float.	6 Marks	L1	CO5	PO1
	b)	The duration of activities of a project is as follows. Draw the PERT network diagram. Identify various paths. Identify the Critical path. Tabulate the computations. Evaluate the project time.	6 Marks	L6	CO5	PO1 PO2 PO3 PO4 PO5 PO10 PO11

Activity	1-2	1-3	2-4	2-5	4-7	5-7	7-8	3-6	6-8
Duration in days	5	10	1	6	12	3	4	7	6

(OR)

10.		The activities of a project are listed below, draw the network diagram and find out the critical path. Find the completion time of the project. Calculate EST, EFT, LST, LFT and mark in the diagram calculated total float and free float, Tabulate the details.	12 Marks	L6	CO5	PO1 PO2 PO3 PO4 PO5 PO10 PO11

Activity	**Duration in days**	**Activities immediately**	
		Preceding	**Following**
A	3	-	B,C
B	4	A	D
C	6	A	D
D	3	B,C	D,E
E	6	C	G
F	4	D	I
G	5	E	H,J
H	3	G	I
I	6	F,H	L
J	4	G	K
K	4	J	L
L	4	I,K	-

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations August – 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)	Explain briefly about surface tension and capillarity.	6 Marks	L2	CO1	PO1 PO10
	b)	The space between two square flat parallel plates is filled with oil. Each side of the plate is 720mm. The thickness of the oil film is 15mm. The upper plate, which moves at 3m/s requires a force of 120 N to maintain the speed. Determine: i) The dynamic viscosity of the oil. ii) The kinematic viscosity of oil if the specific gravity of oil is 0.95	6 Marks	L4	CO1	PO1 PO2 PO4 PO10
		(OR)				
2.	a)	Derive expressions for total pressure and center of pressure for a vertically immersed surface.	6 Marks	L4	CO1	PO1 PO2 PO10
	b)	A circular plate 3 m in diameter is submerged in water in such a way that the greatest and least depths of the surface (below water surface) are 2 m and 1 m respectively, calculate: i) The total pressure on front face of the plate. ii) The position of center of pressure.	6 Marks	L4	CO1	PO1 PO2 PO4 PO10

UNIT-II

3.	a)	i) Distinguish between path lines, stream lines, stream tube and streak lines. ii) The diameters of a pipe at the sections 1-1 and 2-2 are 200mm and 300mm respectively. If the velocity of water at 1-1 is 4 m/s then find discharge through the pipe and velocity of water at section 2-2.	6 Marks	L4	CO2	PO1 PO2 PO10
	b)	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.	6 Marks	L4	CO2	PO1 PO2
		(OR)				
4.	a)	State and prove Bernoulli's equation. List the assumptions which are made while deriving Bernoulli's equation.	6 Marks	L4	CO2	PO1 PO2 PO5 PO10
	b)	Water is flowing at the rate of 40 liters/sec through a tapering pipe. The diameters at the bottom and upper ends are 300mm and 200mm respectively. If the intensities of pressure at the bottom and upper ends are 250 kN/m^2 and 100 kN/m^2 respectively, find the difference in datum head.	6 Marks	L4	CO2	PO1 PO2 PO4 PO10

UNIT-III

5.	a)	State the difference between a wholly submerged orifice and a partially submerged orifice. Derive an expression for discharge through fully submerged orifice.	6 Marks	L4	CO3	PO1 PO2 PO10
	b)	A convergent-divergent mouthpiece is fitted to the side of a tank. It is discharging 5.5 liters/sec of water under a constant head of 2.0 m. If the head lost in the divergent portion is $1/10^{th}$ of the kinetic head at outlet and the separation pressure is 2.5m, find the throat and exit diameters. Take atmospheric pressure = 10.3m of water.	6 Marks	L4	CO3	PO1 PO2 PO4 PO10

(OR)

6.	a)	Explain the following terms: i) Notch. ii) Weir. iii) Nappe or vein. iv) Sill or crest.	6 Marks	L2	CO3	PO1 PO10
	b)	Water is to be supplied to the inhabitants of a college campus through a supply main. The following data is given: Distance of the reservoir from the campus = 3000 m, Number of inhabitants = 4000, Consumption of water per day of each inhabitant = 180 liters, Loss of head due to friction = 18 m and Co-efficient of friction for the pipe, f = 0·007. If the half of the daily supply is pumped in 8 hours, determine the size of the supply main.	6 Marks	L6	CO4	PO1 PO2 PO3 PO4

UNIT-IV

7.	a)	Explain Reynolds's experiment with a neat sketch and list out the characteristics of laminar flow.	6 Marks	L2	CO5	PO1 PO10
	b)	Derive an expression for flow of viscous fluid in circular pipes with assumptions.	6 Marks	L4	CO5	PO1 PO2

(OR)

8.	a)	Distinguish between hydrodynamically smooth and rough boundaries.	6 Marks	L2	CO5	PO1 PO2 PO4
	b)	For turbulent flow in a pipe of diameter 200mm, find the discharge when the center line velocity is 30 m/s and velocity at a point 80mm from the center as measured by pitot tube is 2 m/s.	6 Marks	L4	CO5	PO1 PO2 PO4

UNIT-V

9.		Define Buckingham pi theorem. The thrust force P developed by a propeller depends on the angular velocity **ω**, speed of advance V, diameter D, dynamic viscosity **μ**, mass density **ρ**, elasticity of fluid medium which can be denoted by the speed of sound C with unit m/s. Obtain an expression for P by Buckingham pi theorem.	12 Marks	L4	CO6	PO1 PO2 PO4 PO5

(OR)

10.		List different model laws with scale ratios. In the model test of a spillway the discharge and velocity of flow over the model were 2.5 cumecs and 1.5 m/s respectively. Calculate the velocity and discharge over the prototype which is 36 times the model size.	12 Marks	L4	CO6	PO1 PO2 PO4 PO5

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations August – 2021

MECHANICS OF SOLIDS

[Civil Engineering]

Time: 3 hours **Max. Marks: 60**

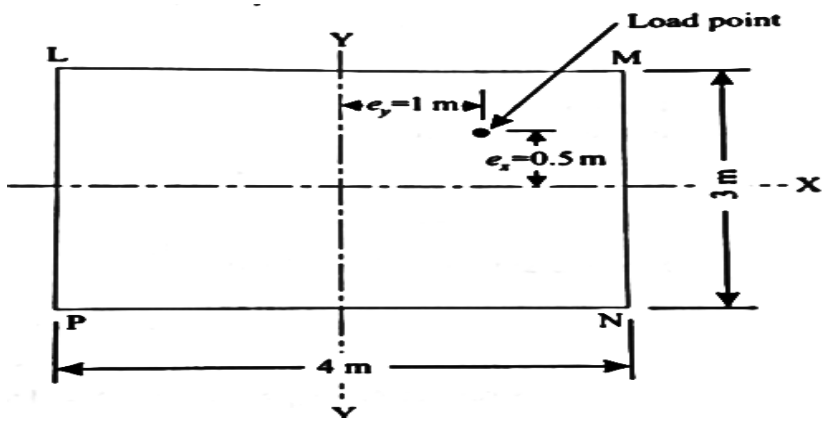
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.		Determine the maximum shear force and bending moment for a simply supported beam carrying a concentrated load 'W' placed eccentrically on the span. Draw SFD and BMD	12 Marks	L4	CO1	PO1 PO2 PO4
		(OR)				
2.		A beam AB 10m long is simply supported at its ends A and B and has an overhang BC of length 2m, it carries uniformly distributed load of 30 kN/m for a distance of 4m from the left end A and a concentrated load of 50 kN and 30 kN at a distance of 2m from either support of the beam respectively. A uniformly distributed load of 10 kN/m acts throughout on the overhang. Determine the maximum shear force and bending moment. Draw SFD and BMD.	12 Marks	L4	CO1	PO1 PO2 PO4 PO10

UNIT-II

3.	a)	Determine the dimensions of joist of a timber of span 8m to carry a brick wall 210mm thick and 5m high. If the density of brick work is 1850 kg/m^3 and the maximum permissible stress is limited to 7.5 MN/m^2. Given that the depth of the joist is twice the width.	6 Marks	L6	CO2	PO1 PO2 PO3 PO4 PO10
	b)	A laminated wood beam 10cm wide and 15cm deep is made up of three 5 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 0.45 MN/m^2, find the safe concentrated load that the beam may carry at its centre.	6 Marks	L5	CO2	PO1 PO2 PO4 PO6 PO10
		(OR)				
4.		A masonry pier of 3m x 4m supports a load of 40 kN as shown in the figure. i) Find the stresses developed at each corner of the pier. ii) What additional load should be placed at the centre of the pier, so that there is no tension anywhere in the pier section? iii) What are the stresses at the corners with the additional load in the centre?	12 Marks	L4	CO3	PO1 PO2 PO6 PO10



UNIT-III

5.	a)	A solid shaft 120 mm in diameter transmits 120 kW at 160 r.p.m. Find the maximum shear stress induced in the shaft. Find also the angle of twist in a length of 7.5m. Take C=8 x 10^4 N/mm².	6 Marks	L5	CO4	PO1 PO2
	b)	A hollow shaft of diameter ratio 3/8 is required to transmit 600 kW at 110 r.p.m., the maximum torque being 20 % greater than the mean. The shear stress is not to exceed 63 MN/m² and the twist in a length of 3m not to exceed 1.4 degrees. Calculate the maximum external diameter satisfying these conditions.	6 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO6
		(OR)				
6.	a)	Derive the shear stress and deflection of a close coiled helical spring subjected to axial twist.	6 Marks	L4	CO4	PO1 PO2
	b)	A closely coiled 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 these diameters if the maximum shear stress in the material of the spring are to be 80 MN/m².	6 Marks	L6	CO4	PO1 PO2 PO3 PO4 PO6

UNIT-IV

7.	a)	Draw the Mohr's stress circle for the direct stresses of 100 N/mm² (tensile) and 40 N/mm² (compressive) and estimate the magnitude and direction of the resultant stresses on planes making angles 20° and 70° with the plane of maximum stress. Also determine the normal and tangential stresses on these planes.	6 Marks	L4	CO5	PO1 PO2 PO6 PO10
	b)	At a point in the web of a girder the bending stress is 70 N/mm² (tensile) and the shearing stress at the same point is 30 N/mm². Calculate the principal stresses at that point.	6 Marks	L4	CO5	PO1 PO2 PO6 PO10
		(OR)				
8.		A shaft is subjected to a maximum torque of 10 kNm and a maximum bending moment of 7.5 kNm at a particular section. If the allowable equivalent stress in simple tension is 160 MN/m², find the diameter of the shaft according to maximum shear strain energy theory.	12 Marks	L6	CO2	PO1 PO2 PO3 PO6 PO10

UNIT-V

9.	a)	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
	b)	A bar of length 4m when used as a simply supported beam and subjected to a udl of 30 kN/m over the entire span, deflects 15mm at the centre. Determine the crippling loads when it is used as a column with both ends are pin-jointed.	6 Marks	L4	CO6	PO1 PO2 PO5 PO6

(OR)

10.	From the following data of a column of circular section calculate the extreme stresses on the column section. Also find the maximum eccentricity in order that there may be no tension anywhere on the section. External diameter = 20 cm Internal diameter = 16 cm Length of the column = 4 m Load carried by the column = 200 kN Eccentricity of the load = 2.5 cm (from the axis of the column) Young's modulus = 94 GN/m²	12 Marks	L4	CO6	PO1 PO2 PO5 PO6

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations August – 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)	Differentiate clearly between plane and geodetic surveying.	4 Marks	L4	CO1	PO1 PO2
	b)	What is the sag correction for a 30m steel tape under a pull of 100N in three equal spans of 10m each? Unit weight of steel is 78.9 kN/m^3 and Area of cross section of tape is 8 mm^2.	5 Marks	L4	CO1	PO1 PO2
	c)	How do surveying influences the environment? How ethics is important in surveying practice?	3 Marks	L3	CO1	PO1 PO7
		(OR)				
2.	a)	A line AC had the magnetic azimuth of 67^{0}15' in 1960. If the magnetic declination was found to be 21^{0}30'E by interpolation from an isogonic chart dated 1950 with an annual change of 1' westward. Determine the true azimuth of line AC.	6 Marks	L4	CO1	PO1 PO2
	b)	Explain the procedure for conducting compass survey along the closed traverse.	6 Marks	L4	CO1	PO1 PO8

UNIT-II

3.	a)	What is three point problem? How is it solved by tracing paper method?	6 Marks	L3	CO1	PO1 PO10
	b)	What are the various methods of leveling? Describe them briefly.	6 Marks	L2	CO2	PO1 PO5
		(OR)				
4.	a)	Describe in short the curvature and refraction.	6 Marks	L3	CO2	PO1 PO10
	b)	Describe the various characteristics and uses of contour lines.	6 Marks	L3	CO2	PO1 PO10

UNIT-III

5.	a)	What are the precautions to be decided while using a theodolite?	5 Marks	L2	CO3	PO1 PO5 PO6
	b)	How is a closed traverse checked in the field? What do you mean by "Balancing a traverse"?	7 Marks	L4	CO3	PO1 PO2
		(OR)				
6.	a)	Derive distance equation for staff vertical condition and explain the role of anallactic lens in stadia tacheometry.	5 Marks	L4	CO3	PO1 PO2 PO5
	b)	The following set of readings refers to observations in a tacheometry survey from station B on stations C and D in clock-wise direction.	7 Marks	L4	CO3	PO1 PO2 PO4 PO10

Staff station	Vertical angle	Horizontal circle angle	Stadia hair readings
C	-5^{0}12'	152^{0}56'	1.044, 2.283, 3.522
D	+2^{0}30'	205^{0}06'	0.645, 2.376, 4.110

Calculate the distance between C and D.

UNIT-IV

7.	a)	The following perpendicular offsets were taken at 10m intervals from a chain line to an irregular boundary line: 3.10, 4.20, 5.35, 6.45, 7.15, 8.25, 7.95 and 5.20 m. find the area: Trapezoidal rule and Simpson's rule.	6 Marks	L4	CO4	PO1 PO2 PO5
	b)	Derive an expression for volume by the prismoidal formula.	6 Marks	L4	CO4	PO1 PO2 PO5
		(OR)				
8.	a)	What are the elements of a simple circular curve? What are unit and sub chords?	4 Marks	L3	CO5	PO1 PO10
	b)	Two tangents intersect at a point B of chainage 25.33m. The deflection angle being 36^0. Calculate all the data necessary for setting down a simple circular curve with radius of 20m, by Rankine's method of deflection angles. Consider peg intervals of 2m; also prepare the setting out table if the theodolite used was having least count 20".	8 Marks	L6	CO5	PO1 PO2 PO3 PO5 PO10

UNIT-V

9.	a)	List out the various modern electronic equipment used in surveying. Explain them in detail.	6 Marks	L2	CO6	PO1 PO5 PO12
	b)	How to determine the area of a piece of land using total station?	6 Marks	L4	CO6	PO1 PO2 PO5
		(OR)				
10.	a)	Write a short note on benefits of drones in surveying and applications of drone surveying.	6 Marks	L3	CO6	PO1 PO5 PO12
	b)	Explain the procedure for the calculation of length in drone surveying.	6 Marks	L4	CO6	PO1 PO2 PO5 PO12

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations August – 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 Coulomb's law in vector form.	6 Marks	L2	CO1	PO1
	b)	Calculate the total flux leaving the cubical surface formed by the six planes x, y, z = ±5 when i) two point charges, 0.1 μC at A(1, -2, 3) and 0.5 μC at B(-1, 2, -2). ii) a uniform line charge of 5 μC/m at x=-2, y=3.	6 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Using Gauss's law, obtain the expression for electric field intensity due to an infinite sheet of charge.	6 Marks	L3	CO1	PO5
	b)	Let Potential, $\mathbf{V=2xy^2z^3}$ and $\boldsymbol{\varepsilon = \varepsilon_0}$ Given the point P(1,2,-1) then, find : i) Potential at P. ii) Electric field intensity at P.	6 Marks	L3	CO1	PO2

UNIT-II

3.	a)	Derive the boundary conditions of the normal and tangential components of electric field at the interface of two media with different dielectrics.	6 Marks	L2	CO1	PO1
	b)	Two extensive homogeneous isotropic dielectrics meet on plane z=0. For z>0, $\varepsilon_{r1} = 4$ and for z<0, $\varepsilon_{r2} = 3$. A uniform electric field $\vec{E}_1 = 5\vec{a}_x - 2\vec{a}_y + 3\vec{a}_z$ exists for z≥0. Determine: i) $\vec{E}_2$ for z ≤ 0, ii) the angles $\vec{E}_1$ and $\vec{E}_2$ make with the interface, iii) the energy densities isn both dielectrics, iv) the energy within a cube of side 2m centred at (3, 4, -5).	6 Marks	L3	CO1	PO2
		(OR)				
4.	a)	Explain in detail about polarization effects induced in dielectric due to electric field.	6 Marks	L2	CO1	PO1
	b)	An electric dipole located at the origin in free space has a moment $\bar{p} = (4\bar{a}_x + 3\bar{a}_y + 2\bar{a}_z)\,nCm$. Determine: i) Potential, V at point Q(1,2,3). ii) Electric field intensity at Q(4, 20^0,0^0).	6 Marks	L3	CO1	PO2

UNIT-III

5.	a)	State and prove Ampere's circuital law in point form.	6 Marks	L2	CO2	PO1
	b)	Using ampere's law, compute $\vec{H}$ in the cylindrical region $0 < \rho < 0.5m$, the current density is , $\vec{J} = 4.5e^{-2\rho}\vec{a}_z \; A/m^2$ and zero elsewhere.	6 Marks	L3	CO2	PO5
		(OR)				

6.	a)	Obtain an expression for force between two straight long and parallel current carrying conductors.	6 Marks	L3	CO2	PO1
	b)	Determine the force per metre length between two parallel wires A and B separated by 10 cm in air and carrying currents of 20A. i) in the same direction. ii) in the opposite direction.	6 Marks	L3	CO2	PO2

UNIT-IV

7.	a)	Derive an expression for force between two straight long parallel current carrying conductors. What will be the nature of force, if the current is carrying in the same direction and opposite directions?	6 Marks	L3	CO2	PO1
	b)	Calculate the force on a straight conductor of length 30cm carrying a current of 5A in $\vec{a}_z$ direction and the magnetic field $\vec{B} = 3.5x10^{-3}\left(\vec{a}_x - \vec{a}_y\right)$ Tesla where $\vec{a}_x$ *and* $\vec{a}_y$ are unit vectors.	6 Marks	L3	CO2	PO2

(OR)

8.	a)	Derive an expression for energy stored in a magnetic field.	6 Marks	L2	CO2	PO1
	b)	If a point charge of 3 coulombs moves with a velocity of $\vec{u} = 7\vec{a}_x + 4\vec{a}_y - 6\vec{a}_z\, m/s$, find the force exerted. i) if the electric field intensity is $\vec{E} = 12\vec{a}_x + 4\vec{a}_y - 6\vec{a}_z\, V/m$. ii) if the flux density is $\vec{B} = 6\vec{a}_x + 5\vec{a}_y + 6\vec{a}_z\ wb/m^2$.	6 Marks	L3	CO2	PO2

UNIT-V

9.	a)	Explain the significance and applications of Maxwell's equations in electromagnetic fields	6 Marks	L3	CO3	PO1
	b)	Given $\vec{B} = (0.5\vec{a}_x + 0.6\vec{a}_y - 0.3\vec{a}_z)\cos(5000t)$ 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.	6 Marks	L3	CO3	PO2

(OR)

10.	a)	Show that in a capacitor, the conduction current and displacement currents are equal.	6 Marks	L2	CO3	PO1
	b)	Explain the following with practical examples. i) Motional EMF. ii) Transformer EMF.	6 Marks	L2	CO3	PO1

CODE No.: 19BT30203 SVEC-19

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations August – 2021

SIGNALS AND NETWORKS

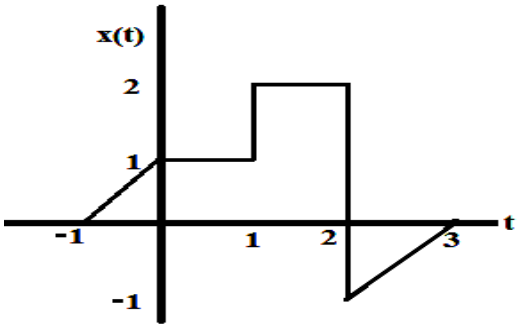
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

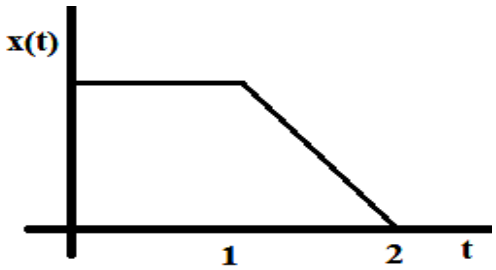
1.	a)	For the continuous time signal shown in the figure, sketch the signal $y(t) = \{x(t) + x(2 - t)\}$.	6 Marks	L3	CO1	PO2



	b)	Determine whether the following signal is periodic or not. If periodic find the fundamental frequency. $x[n] = \cos\left(\frac{\pi}{8}n\right)\sin\left(\frac{\pi}{4}n\right)$.	6 Marks	L3	CO1	PO2

(OR)

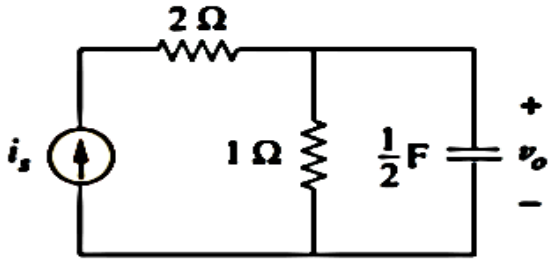
2.	a)	Given the signal *x(t)* as shown in the figure, sketch *x*(-2*t*+3) on the signal *x(t)*.	6 Marks	L3	CO1	PO2



	b)	Investigate whether the signal given by $x[t] = nu[n]$ is power or energy signal?	6 Marks	L4	CO1	PO2

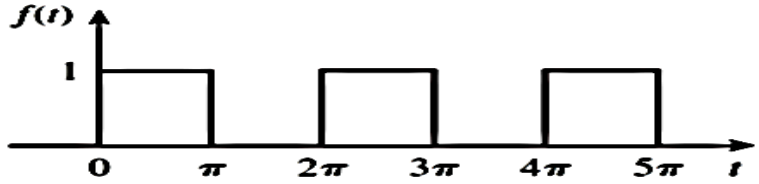
UNIT-II

3.	a)	Distinguish between Fourier series and Fourier transforms.	4 Marks	L2	CO2	PO1
	b)	Find the voltage $V_o(t)$ in the circuit shown in figure using Fourier transforms, if $i_s(t) = 8e^{-t}\,u(t)$.	8 Marks	L3	CO2	PO2



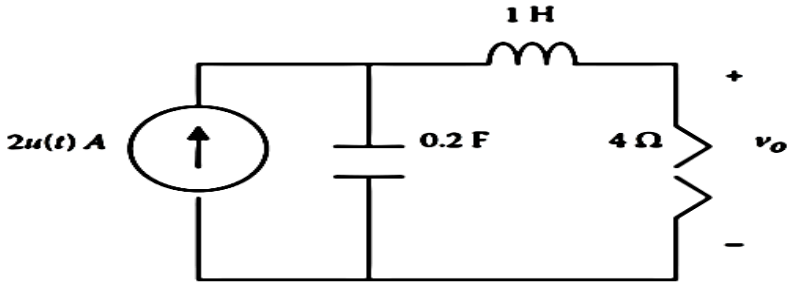
(OR)

4.	a)	State necessary and sufficient conditions for the existence of the Fourier series of a signal.	4 Marks	L2	CO2	PO1
	b)	Find the Fourier transform of the signal shown in the figure.	8 Marks	L3	CO2	PO5



UNIT-III

5.	a)	Find $v_o(t)$ in the circuit shown in figure using Laplace transforms.	6 Marks	L3	CO2	PO5



	b)	Determine the transfer function and impulse response for the system described by: $y[n] - 2y[n-1] - 3y[n-2] = x[n-1]$.	6 Marks	L3	CO2	PO2

(OR)

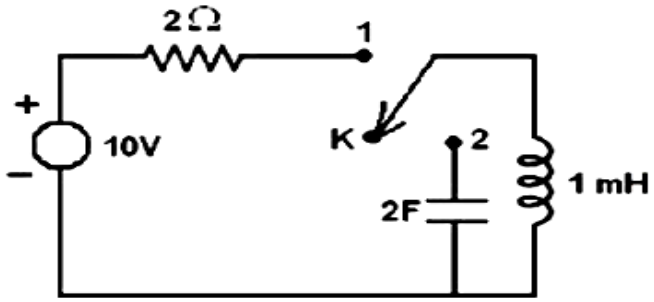
6.	a)	Determine the initial and final values of $f(t)$, if it exist, given that: $F(s) = \frac{5s^2+3}{s^3+4s^2+6}$.	6 Marks	L3	CO2	PO2
	b)	Determine the z-transform and its ROC for the following discrete signal $x[n] = -u[-n-1] + \left(\frac{1}{2}\right)^n u[n]$.	6 Marks	L3	CO2	PO2

UNIT-IV

7.	a)	What is the significance of time constant of R-L circuit? What are the different ways of defining time constant?	4 Marks	L2	CO3	PO1
	b)	A Sinusoidal Voltage of $V(t) = 12 \sin 8t$ Volts is applied at t = 0 to a RL series of R= 4Ω and L = 1 H. By Laplace transform method determine the circuit current I (t). Assume zero initial condition.	8 Marks	L3	CO3	PO5

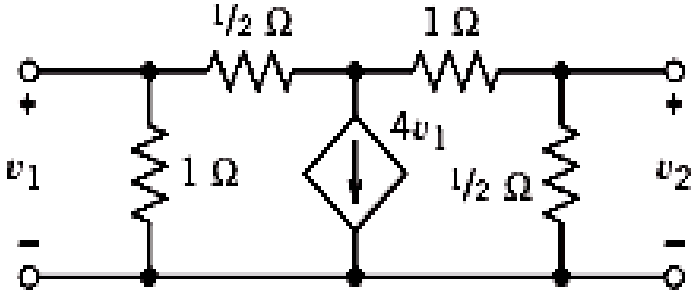
(OR)

8.	a)	What are initial conditions? Explain the procedure to evaluate initial conditions.	4 Marks	L2	CO3	PO1
	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	L3	CO3	PO5



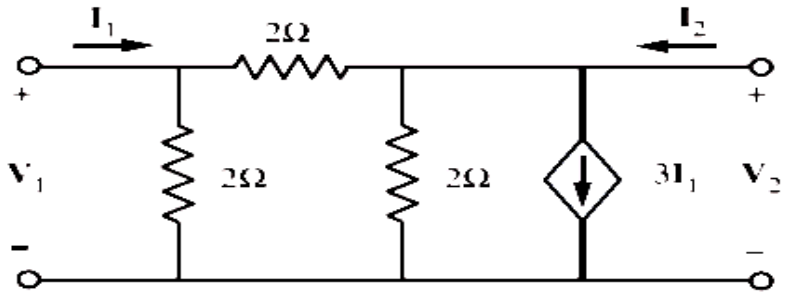
UNIT-V

9.	a)	Express ABCD parameters in terms of impedance parameters for a generalized network.	4 Marks	L3	CO4	PO1
	b)	Determine the hybrid parameters for the network shown in figure. Also investigate the network for reciprocal and symmetry.	8 Marks	L4	CO4	PO4



(OR)

10.	a)	Express h-parameters in terms of admittance parameters for a generalized network.	4 Marks	L3	CO4	PO1
	b)	Determin the admittance parameters for the network shown in figure. Determine whether the netwok is symmetrical, reciprocal or not.	8 Marks	L4	CO4	PO4



CODE No.: 19BT30301 SVEC-19

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations August - 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 do understand by macroscopic and microscopic view points?	6 Marks	L2	CO1	PO1
	b)	Define the following: i) Thermodynamic equilibrium. ii) Reversible process and irreversible process. iii) Homogeneous and heterogeneous system.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Prove that energy a property of the system.	6 Marks	L3	CO1	PO1 PO2
	b)	Air at a temperature of 20°C passes through a heat exchanger at a velocity of 40 m/s where its temperature is raised to 820°C. It then enters a turbine with same velocity of 40m/s and expands till the temperature falls to 620°C. On leaving the turbine, the air is taken at a velocity of 55m/s to a nozzle where it expands until the temperature has fallen to 510°C. If the air flow rate is 2.5 kg/s, calculate : i) Rate of heat transfer to the air in the heat exchanger. ii) The power output from the turbine assuming no heat loss. iii) The velocity at exit from the nozzle, assuming no heat loss. Take the enthalpy of air as h = cpt, where **cp** is the specific heat equal to 1.005 kJ/kg°C and **t** the temperature.	6 Marks	L3	CO1	PO1 PO2 PO3

UNIT-II

3.	a)	Define Clausius and Kelvin Planck Statement.	6 Marks	L1	CO1	PO1
	b)	A heat pump working on the Carnot cycle takes in heat from a reservoir at 5°C and delivers heat to a reservoir at 60°C. The heat pump is driven by a reversible heat engine which takes in heat from a reservoir at 840°C and rejects heat to a reservoir at 60°C. The reversible heat engine also drives a machine that absorbs 30 kW. If the heat pump extracts 17 kJ/s from the 5°C reservoir, determine: i) The rate of heat supply from the 840°C source. ii) The rate of heat rejection to the 60°C sink.	6 Marks	L3	CO1	PO1 PO2
		(OR)				
4.	a)	Discuss the concept of entropy and importance of T-s diagram.	6 Marks	L2	CO1	PO1
	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.	6 Marks	L3	CO1	PO1 PO2

iii) What will be the minimum work needed by a stirrer to bring back the temperature of water to 20°C?

UNIT-III

5.	a)	Draw the phase change process for pure substance or steam formation and explain.	6 Marks	L2	CO2	PO1
	b)	Calculate the internal energy per kg of super heated steam at a pressure of 10 and a temperature of 300^0C.Also find the change of internal energy if this steam expanded to 1.4 bar and dryness fraction 0.8.	6 Marks	L3	CO2	PO1 PO2
		(OR)				
6.	a)	Derive Tds relations in terms of temperature and pressure changes and temperature and volume changes.	6 Marks	L3	CO1	PO1 PO2
	b)	Show that the Joule-Thomson coefficient of an ideal gas is zero.	6 Marks	L3	CO1	PO1 PO2

UNIT-IV

7.		Draw a neat schematic of a compressibility chart and indicate its salient features.	12 Marks	L2	CO3	PO1
		(OR)				
8.	a)	Write the following: i) Mole fraction and Mass fraction . ii) Gravimetric Analysis and Volumetric Analysis.	6 Marks	L2	CO3	PO1
	b)	A vessel having a volume of 0.6m^3 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.	6 Marks	L3	CO3	PO1 PO2

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	6 Marks	L3	CO4	PO1
	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.	6 Marks	L3	CO4	PO1 PO2
		(OR)				
10.	a)	Write the assumption in air standard cycles.	6 Marks	L2	CO4	PO1
	b)	Derive an expression for the thermal efficiency of Diesel cycle and draw P-V and T-S diagrams.	6 Marks	L3	CO4	PO1 PO2

CODE No.: 19BT30302 SVEC-19

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations August – 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

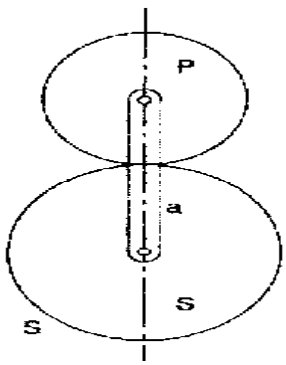
1.	a)	Explain different types of constrained motions with the help of neat sketches.	6 Marks	L2	CO1	PO1
	b)	Sketch and explain Whitworth quick return mechanism.	6 Marks	L2	CO1	PO1
		(OR)				
2.		Explain Grashof's criterion and describe any two inversions of 4 bar chain with suitable sketches.	12 Marks	L2	CO1	PO1

UNIT-II

3.		Name the different mechanisms which are used for mathematically correct straight line motion. Sketch and explain The Hart's straight line motion mechanism.	12 Marks	L3	CO2	PO1 PO2
		(OR)				
4.		Prove that the ratio of the angular velocities of the driven and driving shafts of Hooke's is given by $\frac{\omega_2}{\omega_1} = \frac{\cos\alpha}{1 - \cos^2\theta \sin^2\alpha}$.	12 Marks	L3	CO3	PO1 PO2

UNIT-III

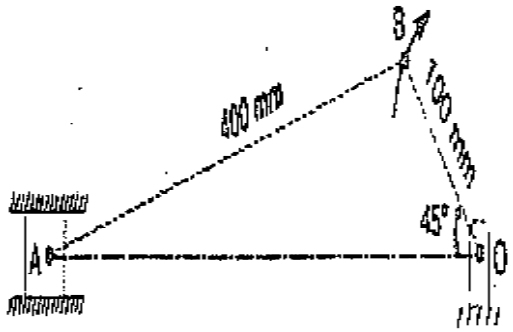
5.		The following data refers to two mating 20^0 involute gears. Number of teeth on pinion is 20. Gear ratio = 2. Speed of pinion is 250 r.p.m. Module = 12mm. If the addendum of each wheel is such that the path of approach and path of recess on each side are half of the maximum permissible length, find : i) The addendum of pinion and gear. ii) The length of arc of contact.	12 Marks	L4	CO4	PO1 PO2 PO3
		(OR)				
6.		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 rpm counter clockwise instead of being fixed.	12 Marks	L4	CO4	PO1 PO2 PO3



UNIT-IV

7.	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 next45^0. 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 50mm. If the rotates at 300 r.p.m, determine the maximum velocity and acceleration of the follower during the outward stroke and return stroke.	12 Marks	L3	CO5	PO1 PO2 PO3
	(OR)				
8.	Draw the profile of the cam operating a roller reciprocating follower and with the following data: Minimum radius of the cam = 25mm, lift = 30mm, roller diameter = 15mm. The cam lifts the follower for 120^0 with SHM followed by dwell period of 30^0. Then the follower lowers down during 150^0 of the cam rotation with uniform acceleration and retardation followed by dwell period. If the cam rotates at a uniform speed of 150 r.p.m, calculate the maximum velocity and acceleration of the follower during the descent period.	12 Marks	L3	CO5	PO1 PO2 PO3

UNIT-V

9.	A four bar mechanism ABCD is made of four links. AD is fixed link which is 180mm long. The links AB, BC and CD are 90mm, 120mm and 120mm respectively. At a certain instant, the link AB makes 69^0 with link AD. If link AB rotates at uniform speed of 120 r.p.m, find: i) Angular velocities of links BC and CD. ii) Velocity of B and C.	12 Marks	L4	CO6	PO1 PO2 PO3
	(OR)				
10.	Locate all the instantaneous centres of the slider crank mechanism shown in following figure. The lengths of crank OB and connecting rod AB are 100mm and 400mm 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. 	12 Marks	L4	CO6	PO1 PO2 PO3

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CODE No.: 19BT30303 SVEC-19

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations August – 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)	Define foundry and explain the types of pattern allowances with a neat diagram.	6 Marks	L2	CO1	PO1
	b)	Outline the sand mold making procedure with neat sketch.	6 Marks	L2	CO1	PO1 PO7
		(OR)				
2.	a)	Discuss the types of molding machines used in sand mold process with neat sketches.	6 Marks	L2	CO1	PO1
	b)	Illustrate the working of cupola furnace with a neat sketch.	6 Marks	L2	CO1	PO1 PO7

UNIT-II

3.	a)	Write short note on continuous casting process.	6 Marks	L2	CO2	PO1 PO7
	b)	List out various casting defects with neat sketches.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	Describe the carbon dioxide molding process in detail.	6 Marks	L2	CO2	PO1
	b)	Write short notes on inspection and testing of castings.	6 Marks	L2	CO2	PO1 PO2

UNIT-III

5.	a)	Define extrusion and describe the types of extrusion process with neat sketches.	6 Marks	L2	CO3	PO1 PO7
	b)	Differentiate hot and cold working process.	6 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Briefly explain on combination die used in sheet metal operations.	6 Marks	L2	CO3	PO1
	b)	Summarize the electro-hydraulic forming process with a neat sketch.	6 Marks	L2	CO3	PO1 PO7

UNIT-IV

7.	a)	Explain the working principle of electron beam welding with its advantages and limitations.	6 Marks	L2	CO4	PO1 PO7
	b)	List the non-destructive tests used in welding.	6 Marks	L1	CO4	PO1
		(OR)				
8.	a)	Explain the various types of flames in gas welding process with neat sketches	6 Marks	L2	CO4	PO1 PO2 PO7
	b)	Describe the soldering process with neat sketches.	6 Marks	L2	CO4	PO1 PO7

UNIT-V

9.	a)	Describe the working principle of transfer molding process.	6 Marks	L2	CO5	PO1 PO7
	b)	Differentiate thermoplastics and thermosetting Plastics.	6 Marks	L2	CO5	PO1
		(OR)				
10.	a)	Explain the working principle of calendaring process.	6 Marks	L2	CO5	PO1 PO7
	b)	Recall the properties and various types of plastics.	6 Marks	L2	CO5	PO1

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations August – 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)	Define the term factor of safety and its importance.	4 Marks	L1	CO1	PO1
	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.	8 Marks	L3	CO2	PO2

(OR)

2.		A rigid block of mass M is supported by three symmetrically spaced rods as shown in Fig 1. Each copper rod has an area of 900 mm²; length of 160 mm; E = 120 GPa; and the allowable stress is 70 MPa. The steel rod has an area of 1200 mm²; length of 240 mm; E = 200 GPa; and the allowable stress is 140 MPa. Determine the largest mass M which can be supported.	12 Marks	L3	CO2	PO2

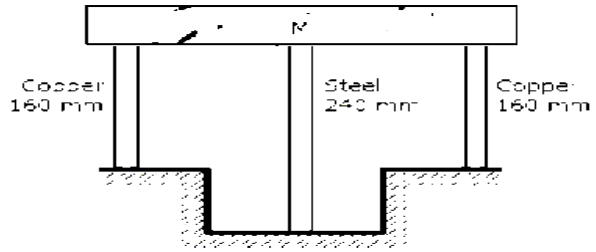

Fig. 1

UNIT-II

3.		Draw the shear force and bending moment diagram for the beam shown in Fig 2. Locate the points of contra flexure, if any. Also find the point of maximum bending moment.	12 Marks	L4	CO2	PO3

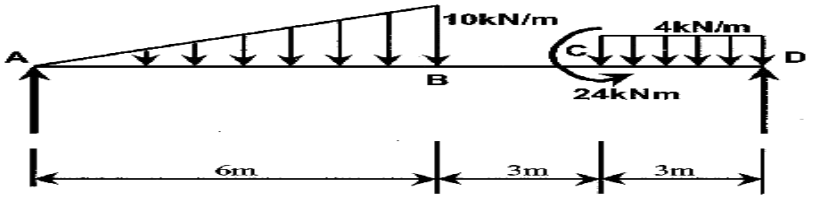

Fig.2

(OR)

4.	a)	Is the point of contra flexure and point of inflexion same? Justify.	4 Marks	L2	CO2	PO1
	b)	A beam ABC of 10 meters length is simply supported at A and B and has overhanging portion BC such that AB = 8m and BC = 2m. The beam carries uniformly distributed load of 2 kN/m over a length of 4m from A, two concentrated loads of 4 kN and 2 kN at a distance of 6m from A and at the free end C respectively. Draw bending moment and shear force diagrams for the beam mentioning all the salient points. Also locate its point of contra flexure.	8 Marks	L3	CO2	PO4

UNIT-III

5.	a)	Derive the expression for shear stress at any point (or in a fibre) in the cross-section of a beam.	4 Marks	L1	CO1	PO1
	b)	An equilateral triangular cross section beam with base 250mm is subjected to a shear force of 150 kN. Draw the shear stress distribution across the section and also determine the average shear stress.	8 Marks	L3	CO3	PO3
		(OR)				
6.		State the assumptions in the theory of simple bending. Also derive the bending equation from first principles.	12 Marks	L1	CO1	PO2

UNIT-IV

7.	a)	State the assumptions involved in deriving the torsion equation.	4 Marks	L1	CO1	PO1
	b)	A solid shaft transmits 250 kW at 100 r.p.m. If the shear stress is not to exceed 75 MPa, what should be the diameter of the shaft? If this shaft is replaced by a hollow one, whose inside diameter is 0.6 times outside diameter. Determine the size and percentage saving in weight, the maximum shearing stress being the same.	8 Marks	L3	CO4	PO2
		(OR)				
8.	a)	Explain in brief about principal planes and principal stresses.	4 Marks	L2	CO4	PO1
	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 500 to the axis of the major principal stress. Also find the maximum shear stress at the point.	8 Marks	L3	CO5	PO2

UNIT-V

9.	A cantilever of 3m length and of uniform rectangular cross-section 150mm wide and 300mm deep is loaded with a 30 kN load at its free end. In addition to this, it carries a uniformly distributed load of 20 kN/m run over its entire length. Calculate: i) maximum slope and maximum deflection. ii) slope and deflection at 2 m from fixed end. Take E = 210 GN/m².	12 Marks	L4	CO6	PO4
	(OR)				
10.	Derive the relations for slope and deflection of a simply supported beam of span 'L' subjected to the following loads. i) When a concentrated load 'W' acts at mid of span? ii) When a UDL of intensity w per unit run act over entire span?	12 Marks	L2	CO6	PO3

CODE No.: 19BT30401 SVEC-19

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations August – 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)	State Coulomb's law. Develop the vector expression for Force due to N number of Charges.	6 Marks	L1	CO1	PO1
	b)	Differentiate Convection and Conduction Currents.	6 Marks	L2	CO1	PO2
		(OR)				
2.	a)	State Ampere's Law. Estimate the magnetic field intensity for an infinite sheet of current density K A/m.	6 Marks	L1	CO1	PO1
	b)	Show that $W_E = \frac{1}{2}\int \varepsilon 0 E^2 dv$.	6 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Explain Faraday's Law for Time Varying Fields.	6 Marks	L2	CO2	PO1
	b)	Develop the Maxwell's two equations for magnetostatic fields in point and integral forms.	6 Marks	L2	CO2	PO2
		(OR)				
4.	a)	Derive the electrostatic Boundary Conditions for: i. i) Dielectric – Dielectric Boundary. ii. ii) Conductor – Dielectric Boundary. iii. iii) Conductor – Free Space Boundary.	6 Marks	L4	CO2	PO2
	b)	Apply Lenz's Law for Magnetic Fields.	6 Marks	L3	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	L3	CO3	PO1
	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	L4	CO3	PO2
		UNIT-IV				
7.	a)	Derive the basic Transmission Line Equations and derive the secondary constants of transmission lines using them.	6 Marks	L2	CO4	PO2
	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.	6 Marks	L3	CO4	PO4

(OR)

8.	a)	Derive the Phase and Group Velocities.	6 Marks	L2	CO4	PO2
	b)	Develop the condition for distortion less and Minimum Attenuation.	6 Marks	L2	CO4	PO3

UNIT-V

9.	a)	Derive the expression for the input impedance of a transmission line of length L.	6 Marks	L2	CO4	PO2
	b)	A transmission line operating at 500MHz has Zo=80Ω, α=0.04 Np/m, β=1.5 rad/m. Find the line parameters R, L, G, and C.	6 Marks	L3	CO4	PO4

(OR)

10.	a)	Show that $Z_0 = \sqrt{ZscZoc}$ is required for impedance matching.	6 Marks	L2	CO4	PO6
	b)	List the applications of smith chart. Also suggest a procedure to plot VSWR using smith chart.	6 Marks	L1	CO4	PO1

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations August – 2021

ELETRONIC DEVICES AND CIRCUITS

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

Time: 3 hours **Max. Marks: 60**

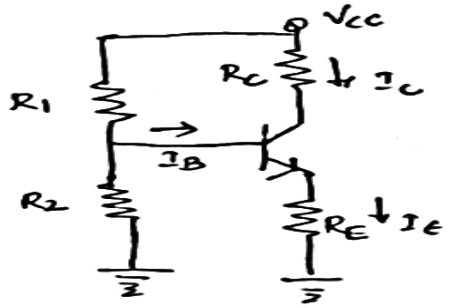
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

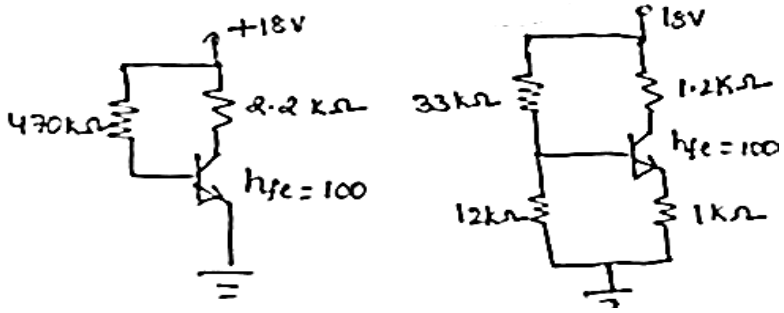
1.		Discuss briefly about series clipper circuits and explain their operation with the help of transfer characteristics.	12 Marks	L2	CO1	PO1
		(OR)				
2.	a)	A square wave whose peak to peak amplitude is 4 V extends ±2 V with respect to ground. The duration of the positive section is 0.3 sec and that of the negative section is 0.1 sec. If this waveform is impressed upon an RC differentiating network whose time constant is 0.3 sec, what are the steady state maximum and minimum values of the output waveform?	6 Marks	L3	CO1	PO4
	b)	Sketch the response of the low pass RC circuit for a step input with different time constants and derive the expression for rise time.	6 Marks	L2	CO1	PO2

UNIT-II

3.	a)	Determine V_{CE} and I_C in the voltage divider biased transistor circuit given in the following figure. Assume V_{CC}=20V, R_1=6.8kΩ, R_2=R_C=R_E=1kΩ, β_{DC}=60. Assume V_{BE}=0.7V.	6 Marks	L3	CO2	PO4



	b)	Design a self-bias circuit and derive the expression for stability factor.	6 Marks	L4	CO2	PO3
		(OR)				
4.	a)	Differentiate bias stabilization and compensation techniques	6 Marks	L2	CO2	PO1
	b)	Determine the change in collector current produced in the following circuits. The circuit temperature raised from 25ºC to 105ºC and I_{CBO}=15nA@25ºC.	6 Marks	L4	CO2	PO4



UNIT-III

5.		Develop the h-parameter model of CE amplifier and derive the expressions for Current gain, Voltage gain, Input Impedance and Output Impedance.	12 Marks	L4	CO3	PO3
		(OR)				
6.	a)	Compare CE, CB and CC amplifiers.	4 Marks	L2	CO3	PO1
	b)	Analyze the Common Base amplifier by using the Approximate hybrid model.	8 Marks	L4	CO3	PO2

UNIT-IV

7.		Explain the construction and working principle of Enhancement mode and depletion mode MOSFET and draw its characteristics.	12 Marks	L2	CO4	PO1
		(OR)				
8.	a)	With help of neat circuit diagram, explain the working of self-bias method for FET	6 Marks	L2	CO4	PO1
	b)	Define the parameters trans-conductance $\mathbf{g_m}$, Drain resistance $\mathbf{r_d}$ and amplification factor $\boldsymbol{\mu}$ of a JFET. Establish a relation between them.	6 Marks	L2	CO4	PO1

UNIT-V

9.	a)	Explain how UJT works as a relaxation oscillator with neat diagram and waveforms. Mention its applications.	8 Marks	L2	CO5	PO6
	b)	Calculate the frequency of a UJT relaxation oscillator when R_E is 10KΩ and C_E is 0.1 μF and Intrinsic stand-off ratio is 0.65.	4 Marks	L2	CO5	PO1
		(OR)				
10.	a)	Draw the internal diagram of an SCR (specifying the different layers and their doping levels) and hence, explain the various operating modes of the device. Also draw the V-I characteristics of the SCR. Mention its applications.	7 Marks	L2	CO5	PO6
	b)	Discuss the V-I characteristics of a Tunnel Diode.	5 Marks	L1	CO5	PO1

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations August – 2021

SIGNALS AND SYSTEMS

[Electronics and Communication Engineering]

Time: 3 hours **Max. Marks: 60**

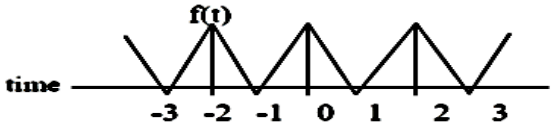
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Discuss the importance of impulse signal with relevant mathematical expressions.	2 Marks	L1	CO1	PO1
	b)	Explain the following properties of systems with examples. i) Stability. ii) Linearity. iii) Causality. iv) Time-invariance.	10 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Sketch y(t)= r(t)+r(t-1) +r(t-2) +r(t-3) where r(t) is unit ramp function.	8 Marks	L2	CO1	PO2
	b)	Define the following Elementary signals. i) Real Exponential Signal. ii) Continuous time version of a sinusoidal signal.	4 Marks	L1	CO1	PO1

UNIT-II

3.	a)	Examine the conditions required for existence of fourier transform.	3 Marks	L1	CO2	PO1
	b)	Apply exponential Fourier series and plot the magnitude and phase spectrum for the triangular waveform shown in figure.	9 Marks	L3	CO2	PO5

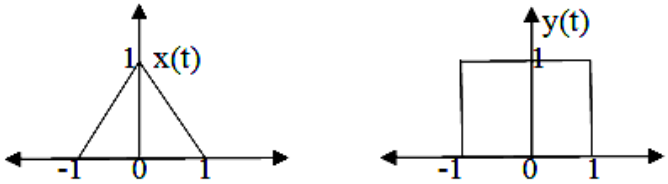


(OR)

4.	a)	State and prove the: i) Modulation theorem of Fourier transform. ii) Duality property of Fourier transform.	4 Marks	L2	CO2	PO2
	b)	Obtain the Fourier transform of the following functions: i) Impulse train. ii) DC Signal. iii) Decaying exponential.	8 Marks	L2	CO2	PO4

UNIT-III

5.	a)	Explain the process of detection of periodic signals in the presence of noise with a specific example.	6 Marks	L4	CO3	PO6
	b)	Prove that for a signal, auto correlation and PSD form a fourier transform pair.	6 Marks	L2	CO3	PO2
		(OR)				
6.	a)	Find the cross correlation between unit triangular and unit gate pulse as follows:	8 Marks	L2	CO3	PO4



	b)	State the properties of auto correlation function.	4 Marks	L1	CO3	PO1

UNIT-IV

7.	a)	Find Laplace Transform of the signal $X(t)=e^{-b\|t\|}$	3 Marks	L1	CO4	PO1
	b)	The input and output of a causal LTI system are related by the differential equation: $\mathbf{d^2 y(t)/dt^2 + 6dy(t)/dt + 8y(t) = 2x(t)}$. i) Find the impulse response of the system. ii) What is the response of this system if $\mathbf{x(t) = t\, e^{-2t}\, u(t).}$	9 Marks	L4	CO4	PO4
		(OR)				
8.	a)	Obtain the inverse transform of $F(s) = x = \frac{1}{s(s-3)(s+10)}$ using partial fraction method.	6 Marks	L3	CO4	PO5
	b)	Bring out the relationship between Fourier transform and Laplace transform?	6 Marks	L2	CO4	PO2

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.	8 Marks	L4	CO5	PO4
	b)	What is aliasing and anti-aliasing? What are the causes to it and how it can be eliminated?	4 Marks	L2	CO5	PO1
		(OR)				
10.	a)	Explain the following sampling techniques. i) Natural sampling. ii) Flat top sampling.	4 Marks	L1	CO5	PO1
	b)	Discuss the process of reconstruction of a signal from its samples using interpolation with relevant mathematical expressions.	8 Marks	L2	CO5	PO2

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations August – 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)	Perform the following decimal subtractions in BCD by the 9's complement method. i) 58.5-18.8. ii) 823.6-123.9.	8 Marks	L2	CO1	PO1
	b)	Express -42.62 in 12-bit 2's complement form.	4 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Reduce the expression $F + \left(\overline{AB + \overline{BC}} \right) \left(\overline{B} + AC \right)$.	6 Marks	L2	CO1	PO1
	b)	Realize the X-NOR function using. i) NAND logic. ii) NOR logic.	6 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Deduce the expression in universal logic for the expression F= πM(1,3,4,9,10,11,13).	6 Marks	L4	CO1	PO2
	b)	Implement F= Σm (1,3,4,9,10,11,14) using 8 x 1 mux.	6 Marks	L4	CO1	PO2
		(OR)				
4.	a)	Realize a full-adder using. i) only NAND gates. ii) only NOR gates.	6 Marks	L3	CO1	PO2
	b)	Simplify the following function using Tabular method. F (A, B, C, D) = Σm(0,1,2,3,4,10,11,12).	6 Marks	L4	CO1	PO2

UNIT-III

5.	a)	Realize the function "F" using MUX. F(P,Q,R,S) = (0,1,3,4,8,9,15)	6 Marks	L4	CO2	PO4
	b)	Draw the BCD to seven segment display decoders	6 Marks	L1	CO2	PO1
		(OR)				
6.	a)	Design a 16-line to 1-line multiplexer using 4-line to 1-line Multiplexer.	6 Marks	L4	CO2	PO6
	b)	Construct a 16 x 1 MUX by modifying the 4 x 16 decoder.	6 Marks	L4	CO2	PO3

UNIT-IV

7.	a)	Explain the working of Master/Slave JK FF.	6 Marks	L1	CO2	PO1
	b)	Differentiate between Asynchronous and Synchronous Counter with neat sketches	6 Marks	L2	CO2	PO2
		(OR)				
8.	a)	Show how ring counter will act as a Johnson counter.	6 Marks	L2	CO2	PO7
	b)	Convert a J-K flip-flop in to i) SR flip-flop ii) T flip-flop iii) D flip-flop	6 Marks	L2	CO2	PO2

UNIT-V

9.	a)	Design a combinational circuit using a PROM. The circuit accepts a 3-bit binary number and generates its equivalent XS-3 code.	6 Marks	L4	CO3	PO7
	b)	Obtain capabilities and limitations of finite state machines with aid of neat sketches.	6 Marks	L2	CO3	PO2
		(OR)				
10.	a)	Use PLA to Implement the following two Boolean functions. $F_1(A,B,C)=\sum m(1,2,4)$ $F_2(A,B,C)=\sum m(3,4,6,7)$	6 Marks	L3	CO4	PO2
	b)	Apply 2-bit binary input to PROM and generate square of the binary input.	6 Marks	L2	CO3	PO4

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations August – 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)	Design a circle radius r = 10, demonstrate the mid point circle algorithm by determining positions along the circle octant in the first quadrant x = 0 to x = y.	6 Marks	L2	CO2	PO3
	b)	Compute the intermediate points using the DDA algorithm when the endpoints of the line is given as (5,4) and (12,7).	6 Marks	L3	CO2	PO2
		(OR)				
2.	a)	Distinguish between Raster scan systems and Random scan systems.	6 Marks	L2	CO1	PO2
	b)	List the operations of following devices. i) CRT. ii) Graphics Monitors and Workstations.	6 Marks	L1	CO1	PO1
		UNIT-II				
3.	a)	Write pseudo code for filling color in an object using Boundary Fill algorithm to fill an 8-connected region.	6 Marks	L1	CO2	PO1
	b)	Define scaling in 3-D Composite Transformations and Rotation with respect to pivot point with its matrix representations.	6 Marks	L2	CO2	PO2
		(OR)				
4.	a)	Derive the matrix forms for the geometric transformations in 2-D graphics for the operations Translation and Rotation.	8 Marks	L1	CO3	PO1
	b)	A triangle defined by vertices A(0,2) ,B(0,3) and C(1,2) perform the following transformations and plot the final positions of the triangle. i) Scale the Triangle by the factor of 1.5. ii) Rotate the Triangle by 900 clockwise. iii) Translate the Triangle 2 Units towards X direction.	4 Marks	L3	CO3	PO2
		UNIT-III				
5.	a)	Illustrate Sutherland-Hodgeman polygon clipping algorithm with suitable example.	6 Marks	L2	CO3	PO2
	b)	Explain Two-Dimensional viewing transformation pipeline.	6 Marks	L1	CO3	PO1
		(OR)				
6.	a)	Write an algorithm to display three dimensional, Hermite curve, given a set of four control points in the XY plane.	6 Marks	L1	CO3	PO1
	b)	Derive the Window-to-viewport coordinate transformation matrix.	6 Marks	L1	CO3	PO2
		UNIT-IV				
7.	a)	Derive the matrix forms for the geometric transformations in 3-D graphics for the operations Scaling and Rotation.	6 Marks	L2	CO3	PO2
	b)	Compare and contrast the properties of Parallel and Perspective	6 Marks	L2	CO4	PO2

Projections.

(OR)

8.	a)	A triangle is located at P(10,40), Q(40,40), R(40,30). Work out the transformation matrix which would rotate the triangle by 90 degree counterclockwise about the point Q. Find the co-ordinates of the rotated triangle.	6 Marks	L3	CO3	PO2
	b)	Extend the Sutherland-Hodgman polygon clipping algorithm to clip three dimensional planes against a regular parallelepiped.	6 Marks	L1	CO3	PO1

UNIT-V

9.	a)	Define Visible Surface Detection and explain. i) Back-face detection. ii) Depth-buffer method.	6 Marks	L1	CO4	PO1
	b)	Apply Depth sorting method to display the visible surfaces in a scene.	6 Marks	L3	CO4	PO2

(OR)

10.	a)	Explain Diffuse Reflection Illumination model with suitable equations.	6 Marks	L1	CO4	PO1
	b)	Explain pros and cons of Gouraud shading and Phong shading technique.	6 Marks	L2	CO4	PO1

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations August – 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)	Show the contents of registers E, A, Q and SC during the process of sign-magnitude multiplication of two binary numbers 10101(multiplicand) and 11111(multiplier). The signs are not included.	6 Marks	L3	CO1	PO2
	b)	Discuss in detail the floating-point representation of binary numbers.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Perform the following arithmetic operations in binary using sign-magnitude representation. i) $(+12)_{10} + (-13)_{10}$ ii) $(-12)_{10} + (-13)_{10}$ iii) $(-6)_{10} - (+13)_{10}$	6Marks	L3	CO1	PO2
	b)	Design a 2 x 2 array multiplier. Draw the logic diagram and explain.	6 Marks	L4	CO3	PO3

UNIT-II

3.	a)	Suppose a machine encodes instructions in 32 bits according to the following format. The instruction contains 1 Opcode field, 2 register address fields and 1 immediate data field. Opcode | Reg1 | Reg2 | Imm Also, suppose the encoding must accommodate 164 op-codes, and 50 registers. Determine what will be number of bits required for each of the fields.	6 Marks	L3	CO2	PO2
	b)	What are the differences between a direct and indirect address instruction? How many references to memory are needed for each type of instruction to bring an operand into a processor register? Explain.	6 Marks	L2	CO2	PO1
		(OR)				
4.	a)	What are register-reference instructions? List any two examples and explain.	6 Marks	L2	CO2	PO1
	b)	Compare the three types of displacement addressing modes – Relative, Base-Register, and Indexed.	6 Marks	L2	CO2	PO2

UNIT-III

5.	a)	Differentiate Hardwired control with Micro-programmed control.	6 Marks	L3	CO2	PO2
	b)	Discuss with the help of a neat diagram, the typical configuration that supports the use of PCI express (PCIe).	6 Marks	L3	CO4	PO1
		(OR)				
6.	a)	Compare cycle-stealing mode and burst mode of DMA technique for data transfer.	6 Marks	L3	CO4	PO2
	b)	How multiple simultaneous interrupt requests are handled by the processor. Design an example combinational circuit and explain.	6 Marks	L3	CO3	PO3

UNIT-IV

7.	a)	Design a 1K x 8 DRAM chip. Draw neat diagram of its chip module organization.	6 Marks	L4	CO3	PO3
	b)	Explain associative cache mapping technique with a neat sketch.	6 Marks	L3	CO2	PO1
		(OR)				
8.	a)	Draw the block diagram of synchronous DRAM chip internal organization. Analyze its control signals and operation.	6 Marks	L2	CO2	PO2
	b)	Analyze memory hierarchy in computer systems with respect to the factors speed, size and cost.	6 Marks	L2	CO4	PO2

UNIT-V

9.	a)	Why bus arbitration is required? Explain with block diagram of bus arbitration using daisy chain.	6 Marks	L3	CO2	PO1
	b)	Construct a diagram for a 4 x 4 omega switching network. Show the switch setting required to connect input 3 to output 1.	6 Marks	L3	CO2	PO2
		(OR)				
10.	a)	Analyze a 4-segment instruction pipeline.	6 Marks	L3	CO2	PO2
	b)	Discuss in detail the multicore organization of Intel Core i7-990X with the help of a block diagram.	6 Marks	L3	CO4	PO1

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations August – 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)	Distinguish between linear and non-linear data structures.	4 Marks	L2	CO1	PO2
	b)	Define linked list. With a neat diagram show how an element is added and removed from front end of the list.	8 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Define Double linked list. Write the implementations related to inserting a node at user specified position and deleting a node at end.	8 Marks	L1	CO1	PO1
	b)	Discuss the advantages and disadvantages of linked lists and arrays.	4 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	Evaluate the given postfix expression **623+-382/+*2$3+**	4 Marks	L4	CO4	PO2
	b)	Explain the list implementation queue data structures and write its implementation.	8 Marks	L3	CO1	PO3
		(OR)				
4.	a)	Explain the relevance of stack implementation with recursive function evaluation.	6 Marks	L3	CO1	PO3
	b)	List out the drawbacks of linear queue? How do overcome it. Explain.	6 Marks	L2	CO1	PO2
		UNIT-III				
5.	a)	Explain the three standard ways of traversing a binary tree with a recursive algorithm.	6 Marks	L2	CO2	PO1
	b)	Define red-black tree. Write how we implement red-black trees.	6 Marks	L2	CO2	PO1
		(OR)				
6.	a)	Construct a binary search tree by inserting the following data sequentially. 45, 32,70,67,21,85,92,40 and explain steps involved in detail.	4 Marks	L3	CO2	PO3
	b)	What are the properties of Height Balanced Trees? With illustrations, explain the merits of Height Balanced Trees when compared with Binary Search Trees. What are the steps involved in balancing of an unbalanced binary search tree? Describe all possible of AVL Rotations.	8 Marks	L2	CO2	PO2
		UNIT-IV				
7.	a)	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.	7 Marks	L3	CO3	PO2
	b)	Explain Java code for binary search with an example.	5 Marks	L2	CO3	PO2
		(OR)				
8.	a)	Arrange the following numbers in increasing order using Quick sort: 10, 18, 29, 68, 32, 43, 37, 87, 24, 47, 50	7 Marks	L2	CO3	PO2
	b)	Explain Java code for linear search with an example.	5 Marks	L2	CO3	PO2

UNIT-V

9.	a)	Describe in detail about breadth first traversal of a graph with suitable example.	6 Marks	L2	CO4	PO2
	b)	Construct and discuss about any two collision avoiding techniques.	6 Marks	L3	CO2	PO3
		(OR)				
10.	a)	Describe in detail about depth first traversal of a graph with suitable example.	6 Marks	L1	CO4	PO1
	b)	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 h2(x)=7 - (x mod 7).	6 Marks	L4	CO2	PO2

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations August – 2021

ELECTRICAL AND ELECTRONIC 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)	Find the multiplying power of a shunt of 200Ω resistance used with a galvanometer of 1000Ω resistance. Determine the values of shunt resistance to give a multiplying power of 50.	6 Marks	L3	CO2	PO2
	b)	Compare Moving coil instruments with moving iron instruments.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	The inductance of a moving iron ammeter with a full scale deflection of 90^{o} at 1.5A, is given by the expression $L=(200+40\theta-4\theta^{2}-\theta^{3})\mu H$, where θ is the deflection in radian from the zero position. Estimate the angular deflection of the pointer for a current of 1.0A.	6 Marks	L2	CO3	PO1
	b)	Rectifier instruments are particularly suited to measurements on communication circuits justify.	6 Marks	L3	CO1	PO1

UNIT-II

3.		Derive the expression for half scale resistance in Shunt Type Ohmmeter.	12 Marks	L3	CO1	PO1
		(OR)				
4.	a)	Discuss about measurement of voltage and current using AC Crompton potentiometer with relevant sketches.	6 Marks	L2	CO1	PO2
	b)	Select and brief an appropriate technique for measurement of Low resistance range of 2 mOhm.	6 Marks	L3	CO1	PO5

UNIT-III

5.	a)	Recall compensation technique for overload and frictional errors occurred in single phase induction type energy meter used in industrial applications.	7 Marks	L3	CO1	PO6
	b)	With a neat diagram, explain the principle and working of TWO -Element Energy meter.	5 Marks	L2	CO1	PO1
		(OR)				
6.	a)	Explain the construction and working principle of single-phase electro dynamo power factor meter.	8 Marks	L2	CO1	PO1
	b)	List the errors associated in dynamometer wattmeter.	4 Marks	L2	CO1	PO1

UNIT-IV

7.	a)	Derive the balance equation of De sauty's bridge for measurement of capacitance.	7 Marks	L3	CO3	PO2
	b)	Select suitable bridge for measurement of unknown capacitance and derive the equations under balance.	5 Marks	L2	CO3	PO5
		(OR)				

8.	a)	Select a bridge which is used to measure weight below 0-5Kgs in industries.	6 Marks	L2	CO3	PO5
	b)	List the factors that causes various errors in bridge measurements.	6 Marks	L2	CO3	PO1

UNIT-V

9.	a)	Select a device which is used for the measuring low frequency and explain in detail	5 Marks	L2	CO4	PO1
	b)	Compare digital frequency meter with frequency synthesizer used for frequency measurement.	7 Marks	L3	CO4	PO1

(OR)

10.	a)	Draw the block diagram of a digital frequency meter and explain its operation.	6 Marks	L2	CO4	PO1
	b)	Digital frequency meters are used for measurement of vibrations in industries justify.	6 Marks	L3	CO4	PO5

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 August - 2021

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)	Construct truth table for the following: i) $(P \vee Q) \wedge R$ ii) $(P \vee \neg Q) \Rightarrow R$ iii) $(P \downarrow Q) \wedge R$	6 Marks	L6	CO1	PO2
	b)	Justify the following expression $((P \vee \neg Q) \wedge (\neg P \vee \neg Q)) \vee Q$ is a tautology or not.	6 Marks	L5	CO1	PO2
		(OR)				
2.	a)	Identify the converse, inverse and contra positive of the following conditional statement. *"If the flood destroys my house or the fires destroy my house, then my insurance company will pay me".*	6 Marks	L1	CO1	PO2
	b)	Find negation of the following statement: $\exists x \in R, x > 3 \Rightarrow x^2 > 9$	6 Marks	L2	CO1	PO1

UNIT-II

3.	a)	Let f and g be functions from R to R, where R is a set of real numbers defined by $f(x) = x^2 + 3x + 1$ and $g(x) = 2x-3$. Find the composition of functions: i) $f \circ f$ ii) $f \circ g$ iii) $g \circ f$.	6 Marks	L2	CO2	PO1
	b)	Examine the functions f and g both of which are from N X N to N given by f(x, y) = x + y and g(x, y) = xy are onto but not one-one.	6 Marks	L4	CO2	PO2
		(OR)				
4.	a)	Define lattice. Also, illustrate properties of lattices.	6 Marks	L1	CO2	PO1
	b)	Determine that (S, /) is a lattice, where S = {1, 2, 3, 6} and / is for divisibility. Prove that it is a distributive lattice.	6 Marks	L5	CO2	PO1

UNIT-III

5.	a)	Examine whether given set 'S,' S= {0,1,2,3,4,5} can be semi-group under binary operation Θ or not.	6 Marks	L5	CO3	PO2
	b)	Explain about semi-group Homomorphism.	6 Marks	L1	CO3	PO1
		(OR)				
6.	a)	Q is the set of rational numbers, $\circ$ is a binary operation defined on Q such that $a \circ b = a - b + ab$ for $a, b \in Q$. Prove $(Q, \circ)$ is a semigroup or not.	6 Marks	L5	CO3	PO2
	b)	Prove that the set Z of all integers with binary operation * defined by $a * b = a + b + 1$, $\forall a, b \in Z$ is an abelian group.	6 Marks	L5	CO3	PO2

UNIT-IV

7.	a)	Choose 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. i) How many viewers in the survey watch all three kinds of games? ii) How many viewers watch exactly one of the sports?	6 Marks	L1	CO4	PO1
	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.	6 Marks	L1	CO4	PO1
		(OR)				
8.	a)	Identify the Coefficient of X^{27} in the expansion of $(X^4+X^5+X^6+\text{-------})^5$	6 Marks	L1	CO4	PO2
	b)	If a_n is a solution of the recurrence relation $a_{n+1} = K\ a_n$ for $n \geq 0$ and $a_3 = 153/49$ and $a_5 = 1377/2401$, find K	6 Marks	L3	CO4	PO1

UNIT-V

9.	a)	Illustrate isomorphism of graphs with an example.	6 Marks	L1	CO5	PO2
	b)	Discuss Euler Circuit and Hamilton graph with an example.	6 Marks	L1	CO5	PO1
		(OR)				
10.	a)	Demonstrate Depth First Search algorithm with an example.	6 Marks	L1	CO5	PO1
	b)	Define MST. Explain Kruskal's algorithm with an example.	6 Marks	L2	CO5	PO1

CODE No.: 19BT31501 SVEC-19

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations August – 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)	Explain the following terms. i) Big-Oh Notation. ii) Big-Omega Notation. iii) Big-ThetaNotation.	6 Marks	L2	CO1	PO1
	b)	Write a program to implement Linear search algorithm and also write the best case, worst case and average case complexities of the algorithm.	6 Marks	L4	CO2	PO3
		(OR)				
2.	a)	Explain Insertion sort algorithm with an example.	6 Marks	L2	CO2	PO1
	b)	Find the complexity of the below Recurrence relation. $T(n) = \begin{cases} 2T(n-1)-1, & if\ n > 0 \\ 1, & otherwise \end{cases}$	6 Marks	L4	CO2	PO5

UNIT-II

3.	a)	Explain with a program how to add two polynomials using a single linked list.	6 Marks	L3	CO3	PO3
	b)	What is a circular double linked list and Write an algorithm to sort the elements of a circular double linked list.	6 Marks	L3	CO3	PO3
		(OR)				
4.	a)	Write a program to perform the following operations on a circular linked list: i) Insertion of a node. ii) Deletion of a node.	6 Marks	L3	CO3	PO3
	b)	Write a menu driven program which will maintain student details such as roll number, name, branch, gender and date of birth of the student using a double linked list. The menu should perform below operations: i) Add a new student. ii) Deleting an existing studentbased on roll number. iii) Display a specific student details. iv) Display all student details.	6 Marks	L3	CO3	PO6

UNIT-III

5.	a)	Convert the following infix expression to prefix expression ((a * ((b / c) + d)) - (e - (d / f))).	6 Marks	L5	CO4	PO3
	b)	Write a program to evaluate a postfix notation and explain with an example.	6 Marks	L3	CO4	PO5
		(OR)				
6.	a)	Explain the following operations of a Circular Queue: i) Inserting an element. ii) Deleting an element. iii) Searching an element.	6 Marks	L2	CO4	PO1
	b)	Discuss how a circular queue is used to overcome the drawback of a linear queue with proper illustration.	6 Marks	L2	CO4	PO1

UNIT-IV

7.	a)	Describe the process of inserting a new node in an AVL tree with proper illustrations.	6 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 pre-order traversal of the BST along with a recursive algorithm.	6 Marks	L4	CO5	PO5
		(OR)				
8.	a)	Differentiate Binary Tree and a Binary Search Tree. Explain the process of searching a node in a Binary Search Tree with an illustration.	6 Marks	L3	CO5	PO2
	b)	Write a program to implement heap sort algorithm.	6 Marks	L4	CO5	PO3

UNIT-V

9.	a)	Illustrate how insertion operation on a B+-tree of order 4 is performed by using the following keys {23,46,57,89,3,4,67,194,45,2,8}.	6 Marks	L3	CO5	PO2
	b)	Create a hash table using linear open addressing for the data items {28, 44, 17, 9, 34, 56, 11, 86, 55, 22, 39, 49, 52, 82,10, 4,3,17}. Assume that the hash function is h(x)= x mod 5, and the hash table contains 5 buckets and each bucket can hold 4 data items.	6 Marks	L4	CO6	PO3
		(OR)				
10.	a)	Write a program to implement Breadth First Search algorithm.	6 Marks	L3	CO5	PO5
	b)	Discuss the operations of a B+-tree with suitable examples.	6 Marks	L2	CO5	PO2

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Supplementary Examinations August – 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)	Explain layered approach operating system structure.	6 Marks	L2	CO1	PO1
	b)	Discuss about system calls.	6 Marks	L2	CO1	PO1
		(OR)				
2.	a)	Describe Multithreading models 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 semaphores, explain solution for Producer-Consumer classical synchronization problem.	6 Marks	L3	CO2	PO5
		(OR)				
4.	a)	Describe necessary conditions for deadlock occurrence.	6 Marks	L2	CO3	PO1
	b)	Suppose there are four processes in execution with 12 instances of resources R in a system.	6 Marks	L3	CO3	PO3

The maximum need of each process and current allocation are given below:

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 contiguous memory allocation.	6 Marks	L2	CO4	PO1
		(OR)				

6.	a)	Describe FIFO 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 access 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 denial of service.	6 Marks	L2	CO6	PO2

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]

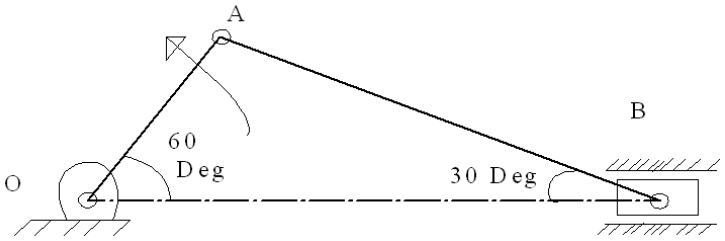
Time: 3 hours **Max. Marks: 70**

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

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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

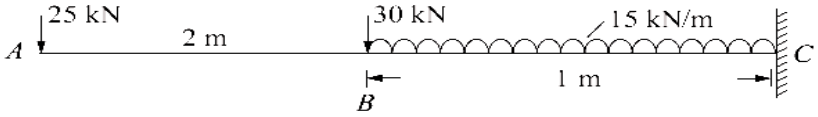
i) The Principal planes and Principal stresses.
ii) The planes of maximum Shear and its magnitude.
iii) Resultant stress on the plane on which 40 MPa stress is acting.

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

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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

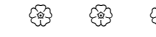
UNIT-V

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.



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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

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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

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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

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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

$X(z) = \log(1 - 1\, az^{-1};\ |z| > |a|$

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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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]

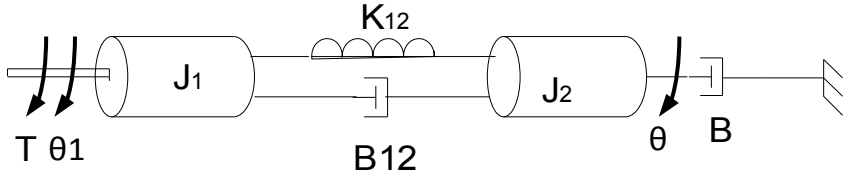
Time: 3 hours **Max. Marks: 70**

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

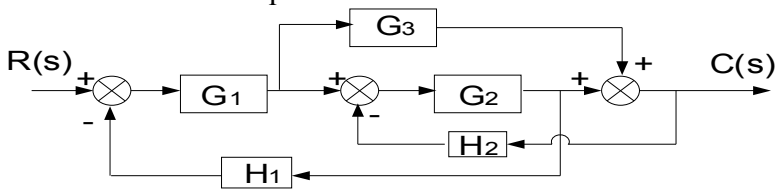
b) For the mechanical system, draw the electrical analogous circuits based on Torque-Voltage and Torque-Current analogy along their equations. 7 Marks



(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 + $3(K+1)s^2 + (7K+5)s+(4K+7) = 0$ 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

$$A=\begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -6 & -11 & -6 \end{bmatrix}$$

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

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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC14) Supplementary Examinations March – 2021

SIGNALS AND SYSTEMS

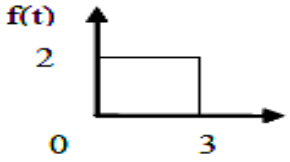
[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

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



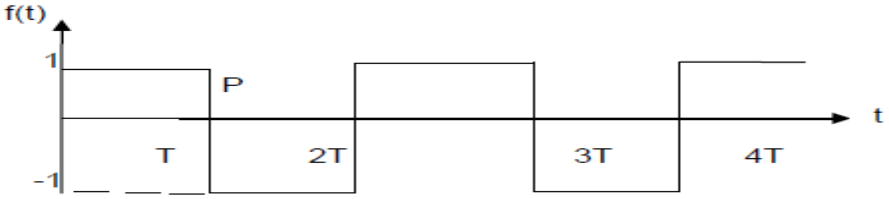
b) Find convolution of sequences x[n] = 2^n and h[n] = u[n]. 6 Marks

(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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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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]

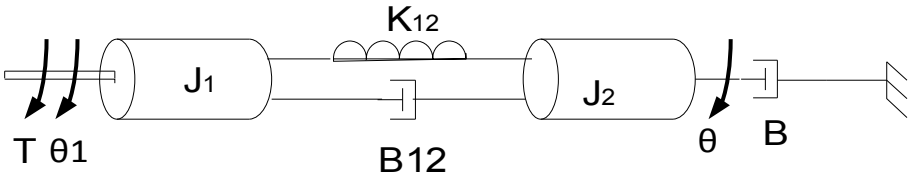
Time: 3 hours **Max. Marks: 70**

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

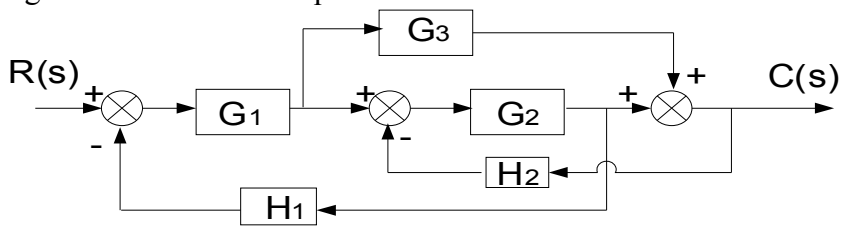
b) For the mechanical system, draw the electrical analogous circuits based on Torque-Voltage and Torque-Current analogy along their equations. 7 Marks



(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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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

STRUCTURAL ANALYSIS - I

[Civil Engineering]

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

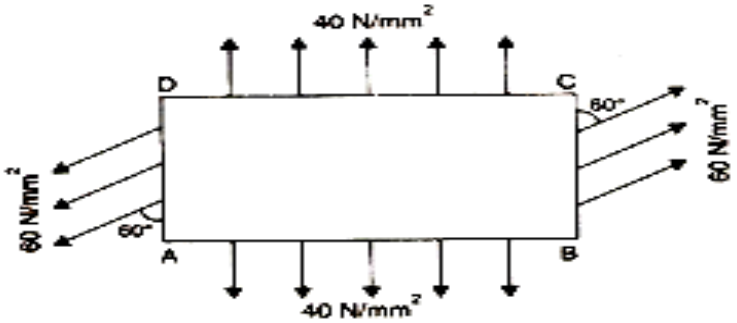
Answer One Question from each Unit
All questions carry equal marks

UNIT-I

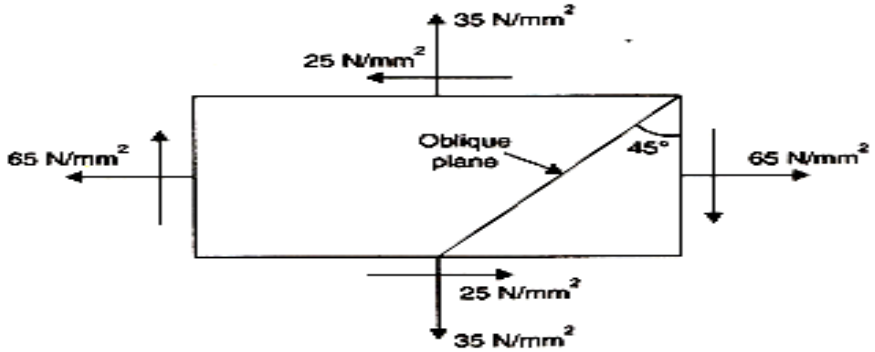
1	a)	Direct tensile stresses of 120 MPa and 70 MPa act on a body on mutually perpendicular planes. What is the magnitude of shearing stress that can be applied so that the major principal stress at the point does not exceed 135 MPa? Determine the value of minor principal stress and the maximum shear 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

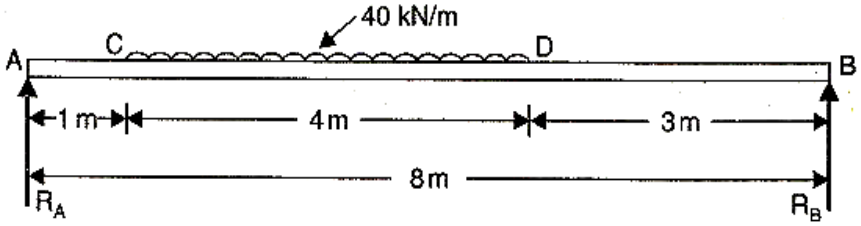


UNIT-II

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)

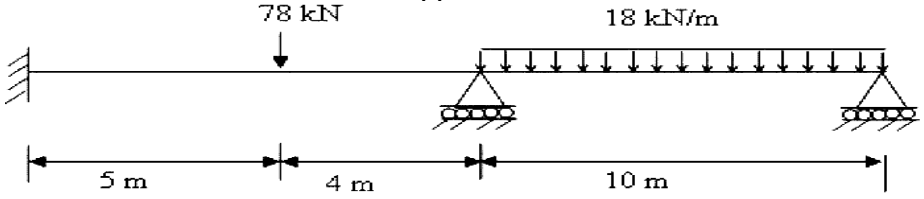
6		Euler's critical load for a column with both ends hinged is found as 40 kN. What would be the change in the critical load if both ends are fixed and one end fixed, and other end is hinged?	CO5	14 Marks

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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

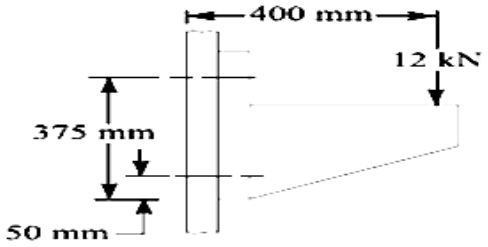
1	a)	What are the basic requirements of a machine element?	CO1	7 Marks
	b)	What are the general considerations in designing a machine component?	CO1	7 Marks
		(OR)		
2	a)	What do you understand by preferred numbers? What is their significance in design?	CO1	7 Marks
	b)	The principal stresses induced 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

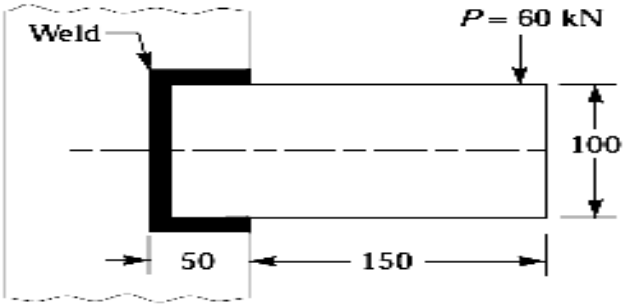
UNIT-III

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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC16) Supplementary Examinations August – 2021

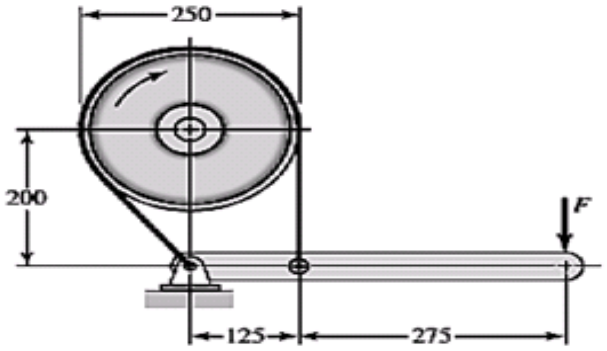
DYNAMICS OF MACHINERY
[Mechanical Engineering]

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)

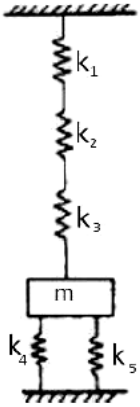
8	a)	Discuss in detail about the balancing V – twin Engine	CO1	4 Marks
	b)	Four masses A, B, C and D are completely balanced. Masses C and D make angles 90^0 and 195^0 respectively with that of mass B in the counter clock wise direction. The masses at B, C and D are 25kg, 40kg and 35kg respectively. 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

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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**

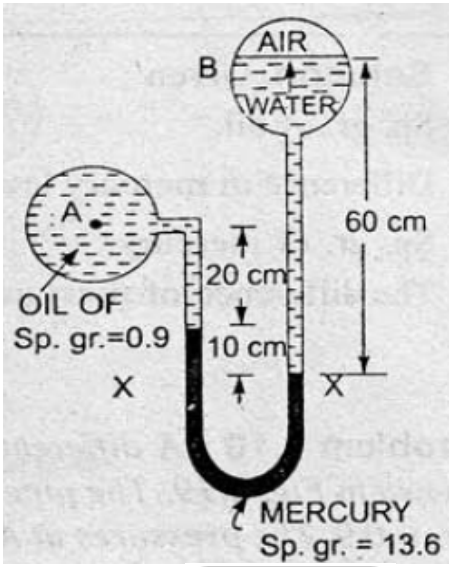
Answer One Question from each Unit
All questions carry equal marks

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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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^{o}C,.Ambient temperature = 25^{o}C, Barometric pressure = 1 bar, Air to fuel ratio by weight = 30, temperature of exhaust gases = 355^{o}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

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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

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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**

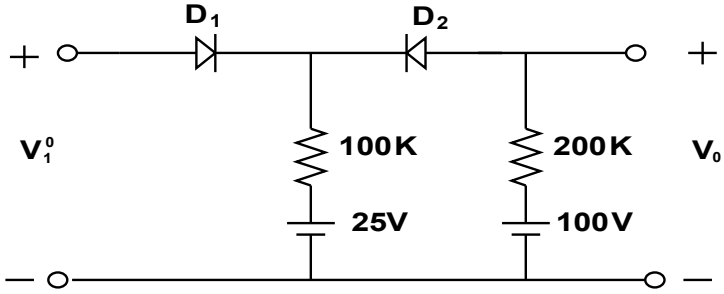
Answer One Question from each Unit
All questions carry equal marks

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

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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

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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

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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

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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

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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

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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

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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

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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]

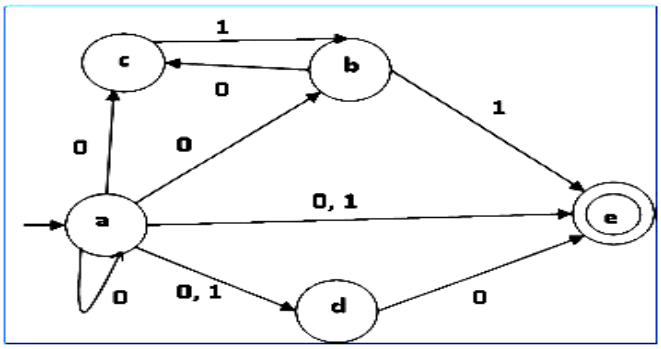
Time: 3 hours **Max. Marks: 70**

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)

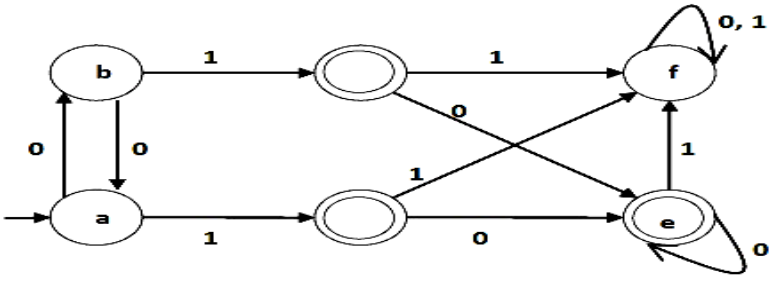
2 a) Define the closure properties of NFA. CO1 7 Marks

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

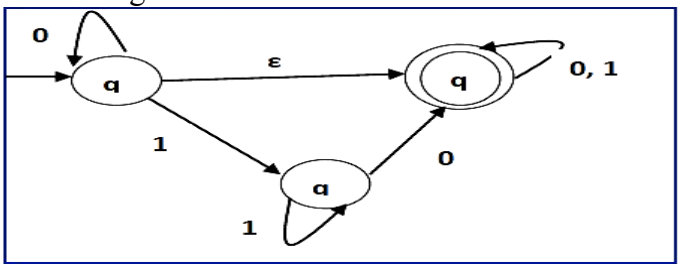


b) Explain the properties of Regular Sets. CO2 7 Marks

(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

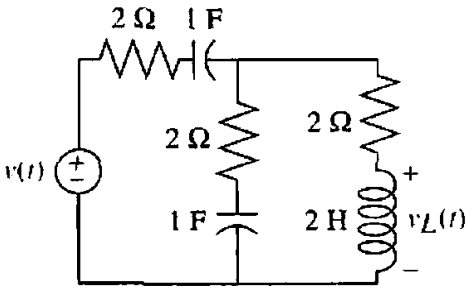
CONTROL SYSTEMS
[Electronics and Instrumentation Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

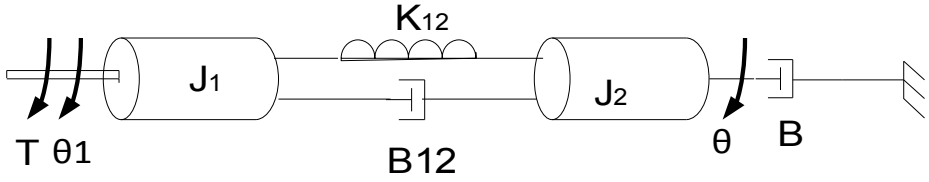
UNIT-I

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.

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

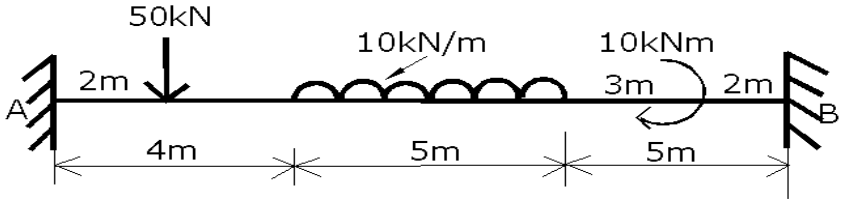
3		Derive expression to find out the equations for slope and deflection of a simply supported beam of length L and uniform EI with a central point load P. evaluate its maximum slope and deflection.	CO1	14 Marks
		(OR)		
4	a)	Using moment area theorem, find the maximum deflection in the simply supported 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

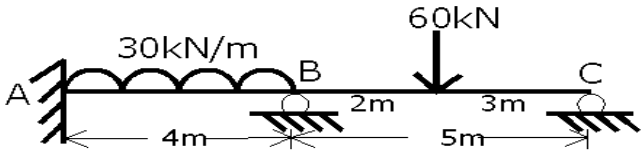
7 a) Calculate the fixed end moments for the given beam CO4 7 Marks



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

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

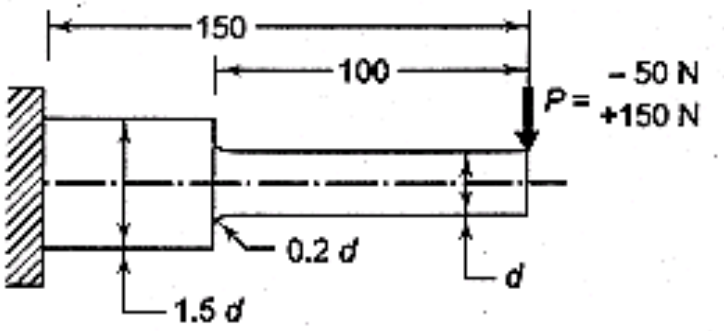
1	a)	Explain the design process with the help of a flow diagram.	CO1	8 Marks
	b)	What are the various manufacturing considerations in machine design? Explain.	CO1	6 Marks

(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)

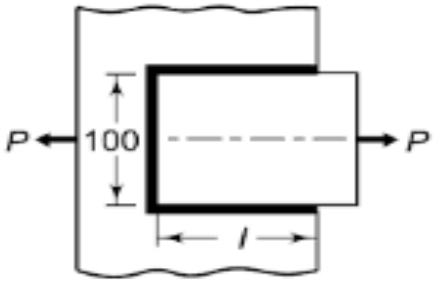
4	a)	What is stress concentration? How does it affect the fatigue strength?	CO1	6 Marks
	b)	A machine member is made of plain carbon steel of ultimate strength 650N/mm^2 and endurance limit of 300N/mm^2. If the member is subjected to a fluctuating torsional moment which varies from –200N-m to 400N-m. 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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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CODE No.: 16BT40305 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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 $\phi = \pi/2,\ 1 \le \rho \le 2m,\ 0 \le z \le 5m$.	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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

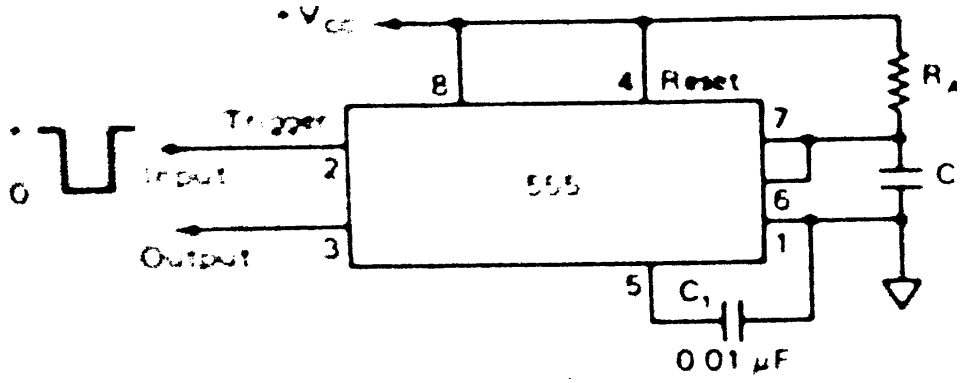
3	a)	Prove that an Op-Amp can be used to find the log of a given analog signal.	CO3	7 Marks
	b)	Analyze instrumentation amplifier circuit using op amp and discuss its applications.	CO2	7 Marks
		(OR)		
4	a)	Evaluate the time period of a free running astable multivibrator used as square wave generator 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

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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

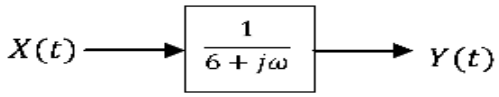
UNIT-III

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

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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**

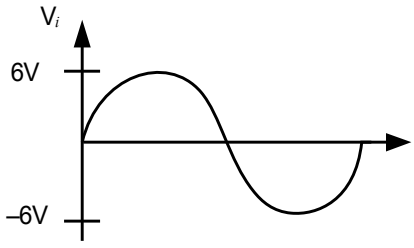
Answer One Question from each Unit
All questions carry equal marks

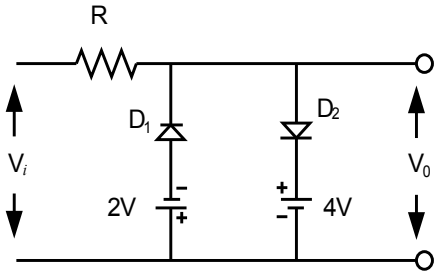
UNIT-I

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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

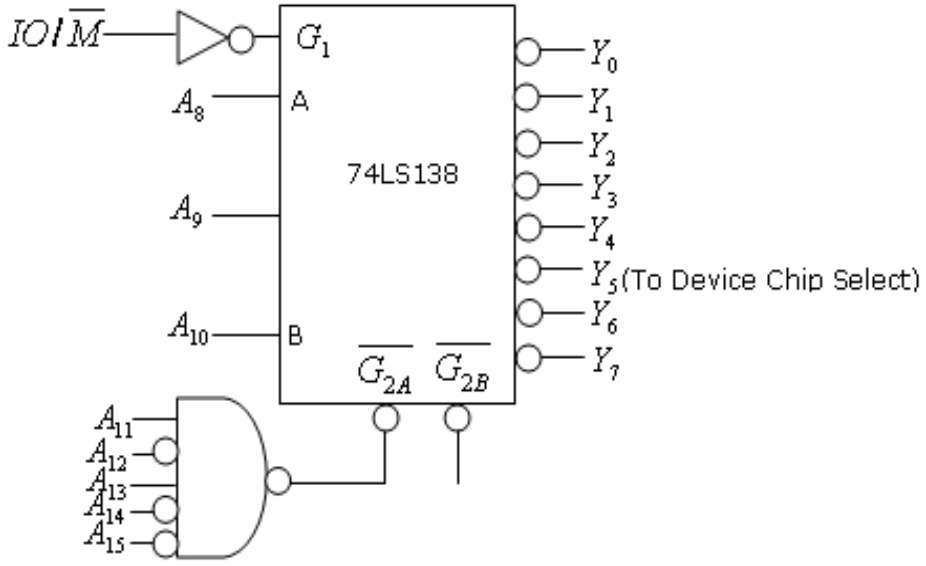
1	a)	On what parameters the computers are classified? Explain the types of computers with their applications.	CO1	7 Marks
	b)	Briefly explain about the functional units of a computer.	CO1	7 Marks
		(OR)		
2	a)	Explain the construction and working of one cell of DRAM and ROM.	CO1	7 Marks
	b)	Compare SRAM 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

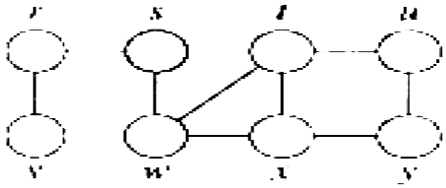
	b)	Evaluate the time complexity of the below pseudocode:
		Algorithm Sample
		{
		temp=1
		repeat {
		for i=1 to n
		{
		temp = temp + 1;
		n = n/2;
		}
		} until n <= 1 ;
		}
			CO4	7 Marks

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

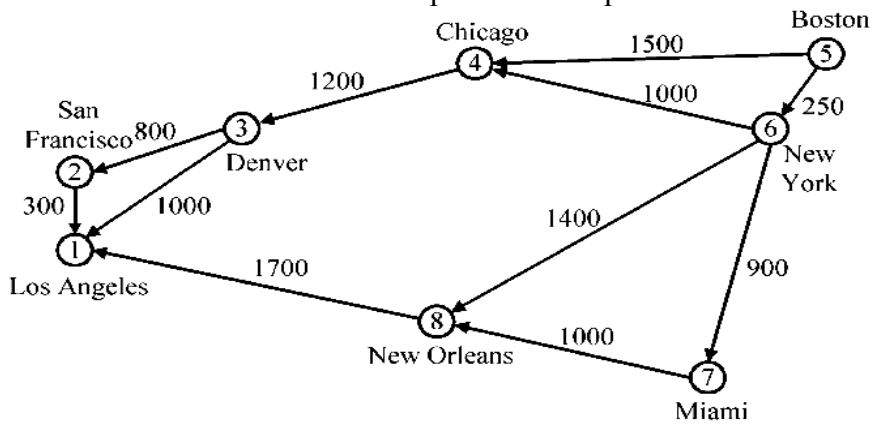


UNIT-III

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

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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

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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

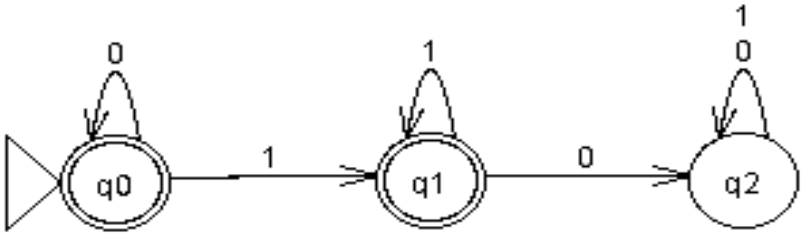
	c)	Differentiate between NFA and DFA.	CO2	4 Marks

(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 $x(t) = \cos(4\pi t)$ and $y(t) = \sin(4\pi t)$.	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

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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

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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 2m×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 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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

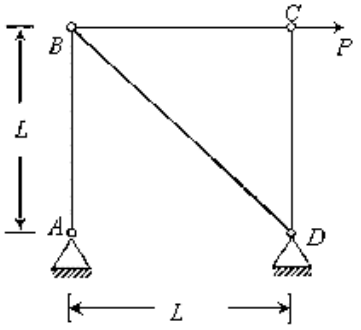

Fig. 1

(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

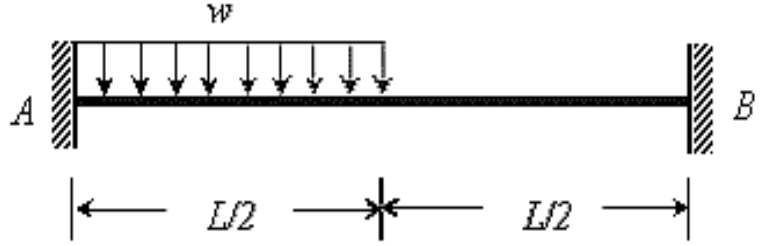

Fig. 2

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

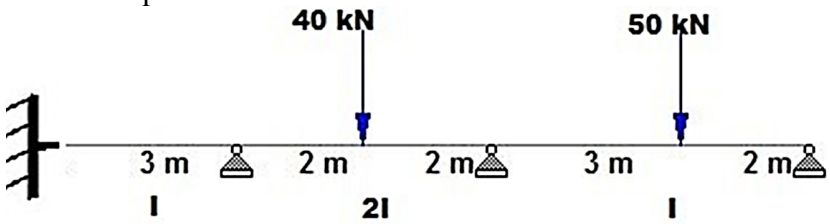

Fig. 3

(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

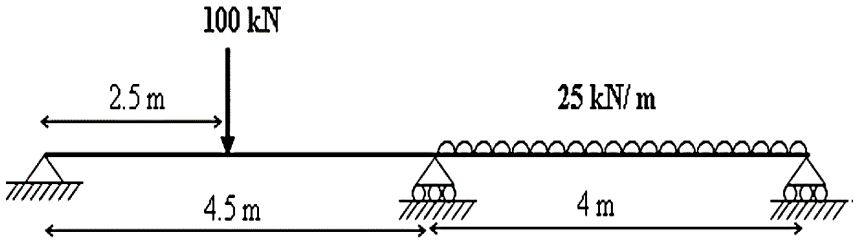

Fig. 4

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

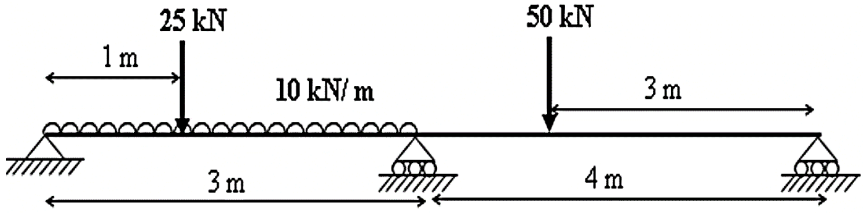

Fig. 5

(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

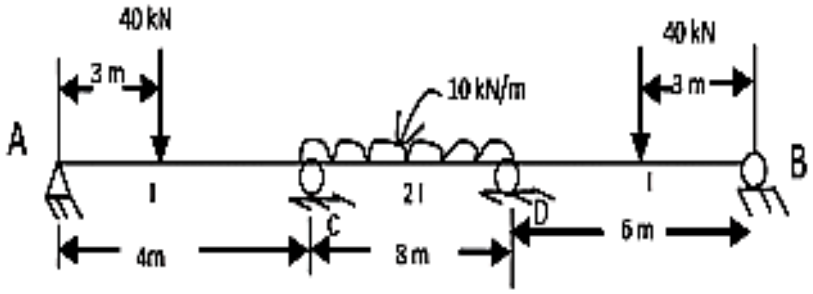

Fig. 6

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

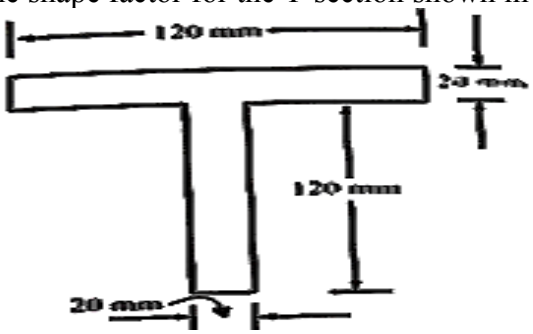

Fig. 7

	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

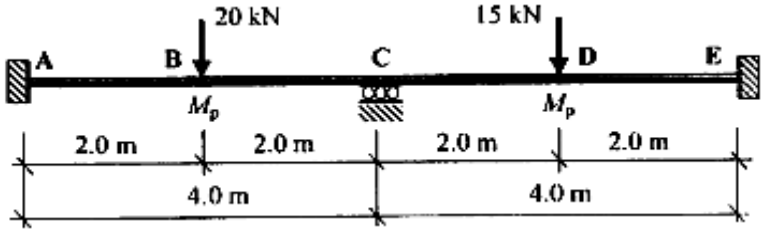

Fig. 8

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

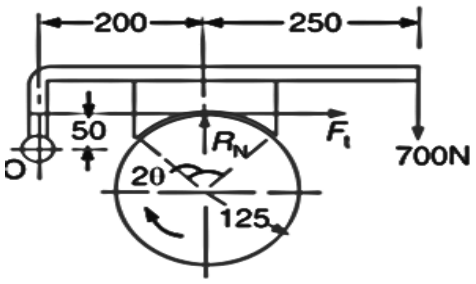
[Mechanical Engineering]

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

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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

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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

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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

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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

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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.

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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

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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]

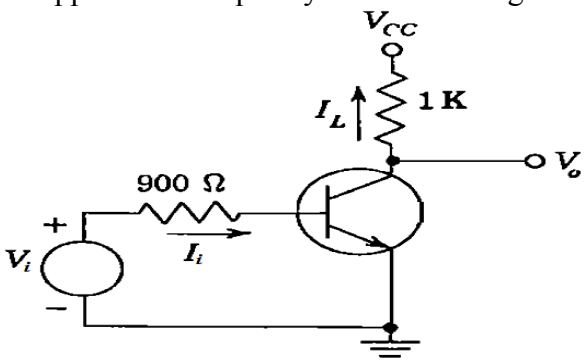
Time: 3 hours **Max. Marks: 60**

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

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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

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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

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

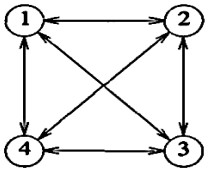
1.	a)	Discuss various types of asymptotic time complexity notations.	6 Marks	L1	CO1	PO1
	b)	Write a recursive function to find the sum of n natural numbers. Show its time complexity using step count method	6 Marks	L3	CO3	PO3
		(OR)				
2.	a)	Solve the following recurrence relation and find its asymptotic 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

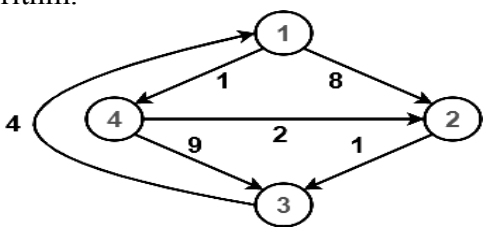


(a)

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)

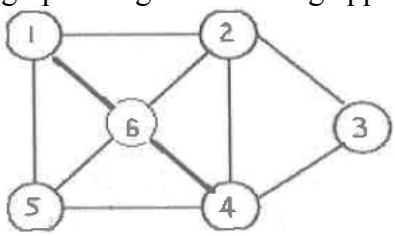
6.	a)	Give the general method of dynamic programming and discuss its applications.	6 Marks	L1	CO2	PO1
	b)	Construct an Optimal Binary Search Tree for (do, if, int, while), p(1:4) =(3,3,1,1) and q(0:4)=(2,3,1,1,1).	6 Marks	L3	CO2	PO2

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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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)

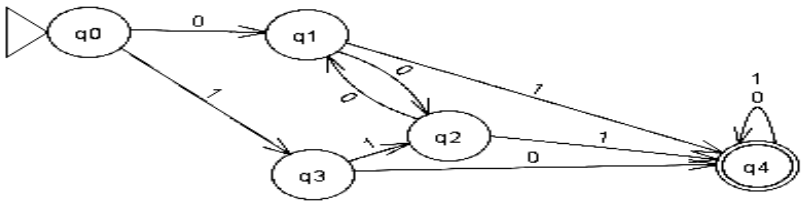
2.	a)	Construct NFA for the following NFA with **ε**-moves, where q_1 is an initial and the final state.	6 Marks	L3	CO1	PO2

	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

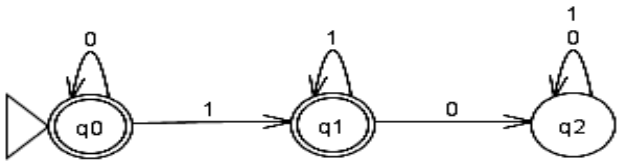
UNIT-II

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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

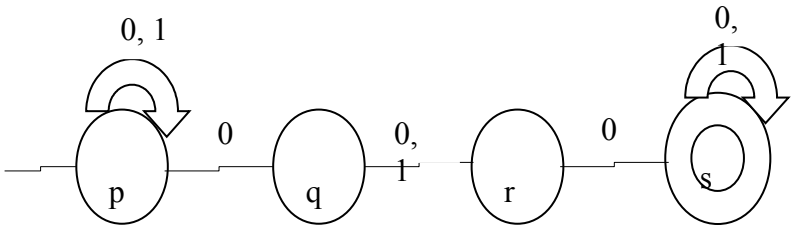
THEORY OF COMPUTATION
[Information Technology]

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)

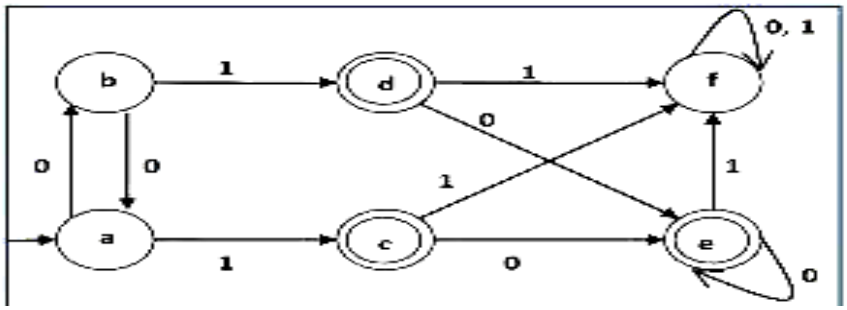
2.	a)	State and prove equivalence of NFA with ε – transitions and NFA.	6 Marks	L4	CO2	PO3
	b)	Compare and contrast Moore machine and Mealy machine.	6 Marks	L3	CO1	PO2

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

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

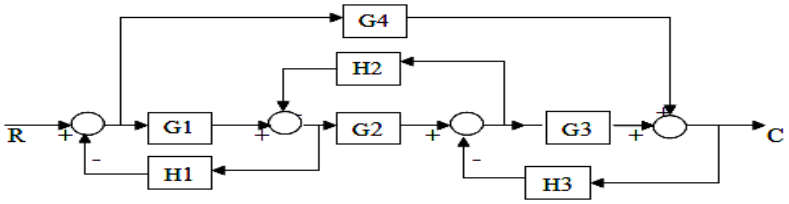
CONTROL SYSTEMS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

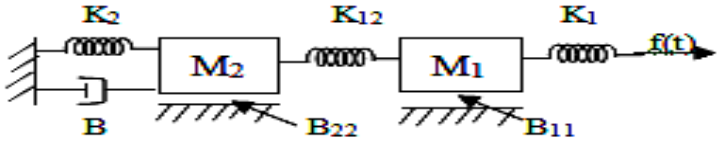
Time: 3 hours **Max. Marks: 60**

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

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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

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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

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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

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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

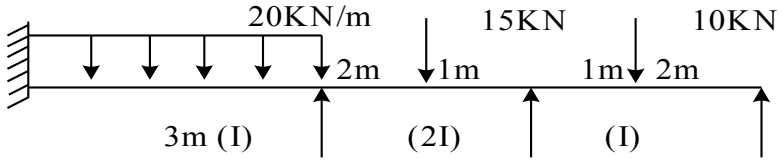
1 Two point load of 150kN and 250kN spaced 3m apart cross a girder of span 15m from left toright with 150kN load leading. Find the values of maximum positive and negative shear force and bending moment at a section D, 6m from left hand support. Also find the absolute maximum bending moment due to given 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

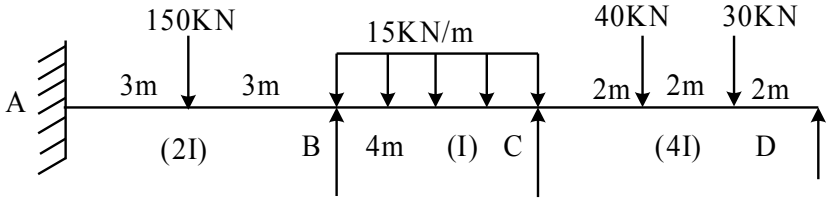
UNIT-II

3 Analyse following continuous beam by slope deflection method and sketch the BMD. 14 Marks



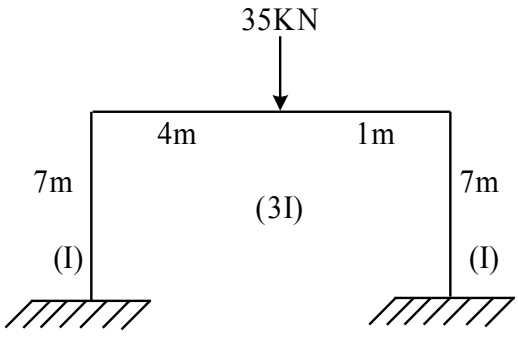
(OR)

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

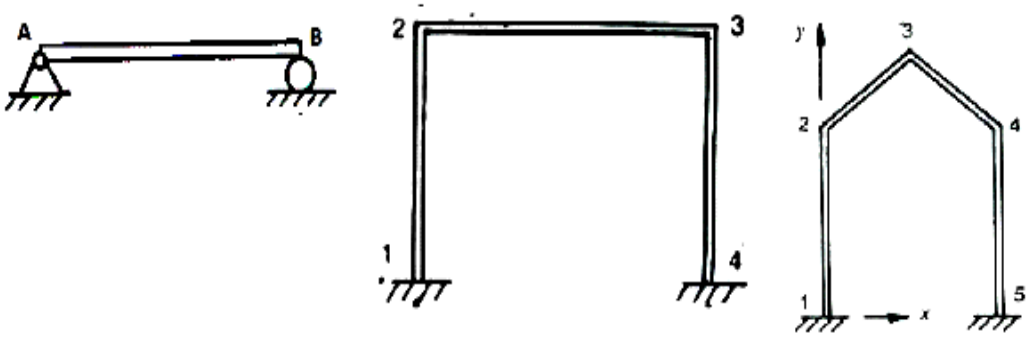
7 What is a Tube structure in tall buildings? Explain the various types of Tube structures in detail using sketches. 14 Marks

(OR)

8 Explain the analysis of a building frame subjected to horizontal forces using Portal method with the help of an example. 14 Marks

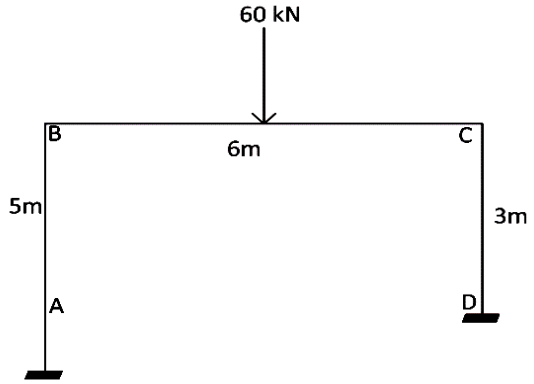
UNIT-V

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



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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.

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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

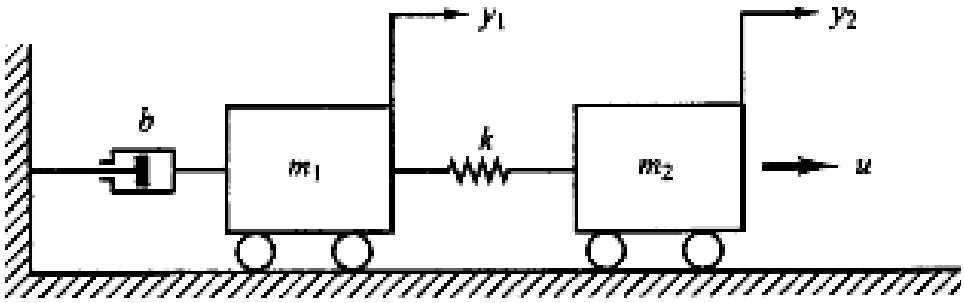
UNIT-I

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

$$A = \begin{bmatrix} 0 & 2 & 0 \\ 1 & 2 & 0 \\ -1 & 0 & 1 \end{bmatrix} B = \begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix} C = \begin{bmatrix} 1 & 0 & 1 \end{bmatrix}$$

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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

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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

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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

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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

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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

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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

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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

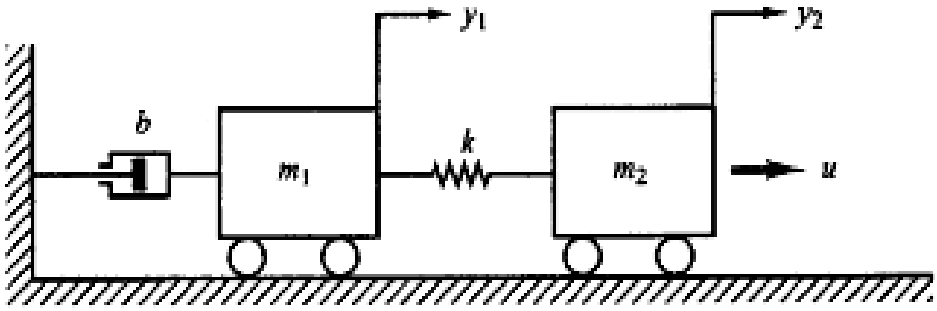
UNIT-I

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 $G(s) = \dfrac{10}{s(0.1s + 1)}$ 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.

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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.

CODE No.:14BT50403 SVEC-14

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**

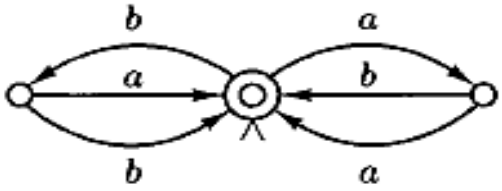
Answer One Question from each Unit
All questions carry equal marks

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

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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.: 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

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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

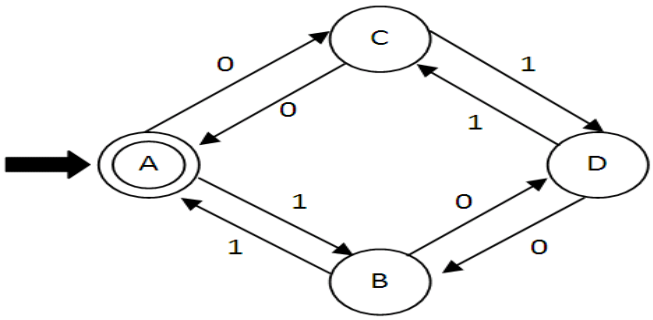
[Computer Science and Engineering]

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

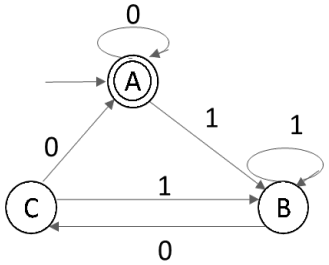
	b)	Construct a FA accepting all strings over {a, b} ending in aba or aaba.	CO3	7 Marks

UNIT-II

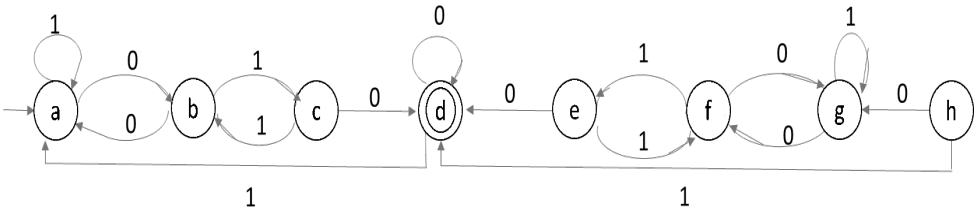
3	a)	Show that the following language is not regular L = { a^P| P is Prime }.	CO5	7 Marks
	b)	How can we say that 2 DFA's are equivalent? Explain with help of an example.	CO1	7 Marks

(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

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

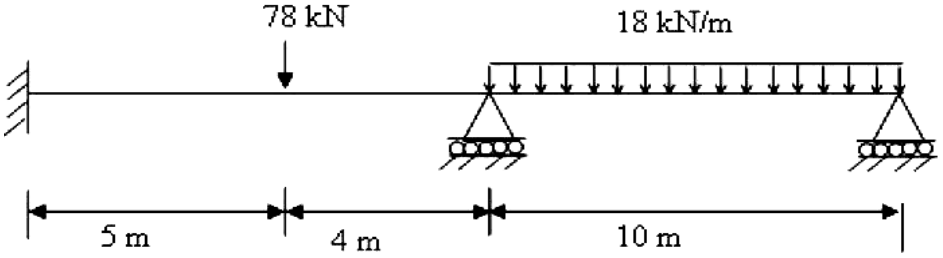
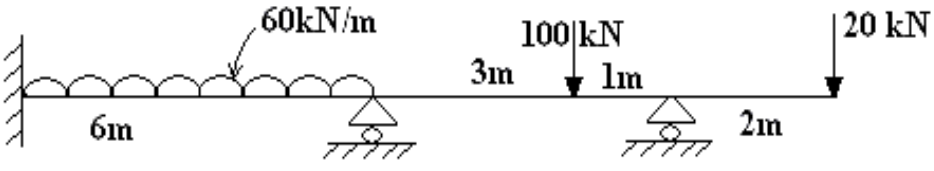


Figure 1

(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

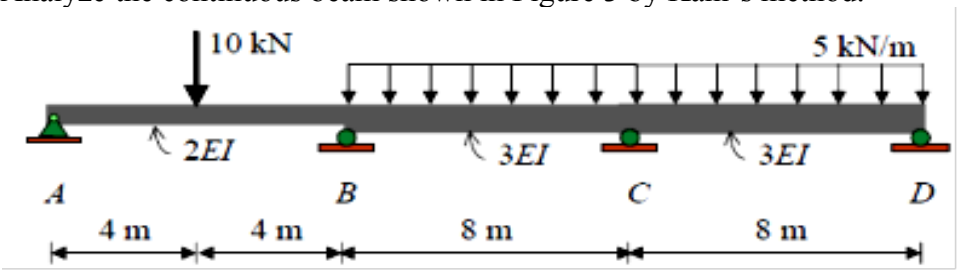


Figure 3

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

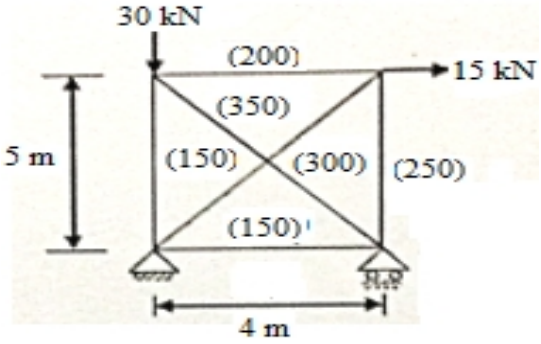


Figure 4

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

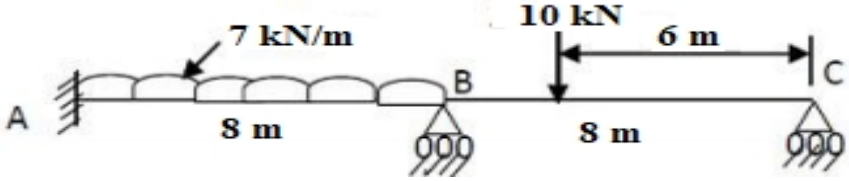


Figure 5

(OR)

10		Calculate the plastic moment capacity required for the continuous beam with working loads shown in Figure 6.	CO3	14 Marks

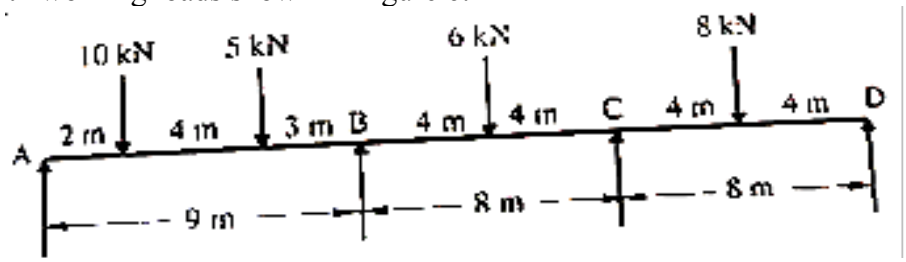


Figure 6

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

CONTROL SYSTEMS

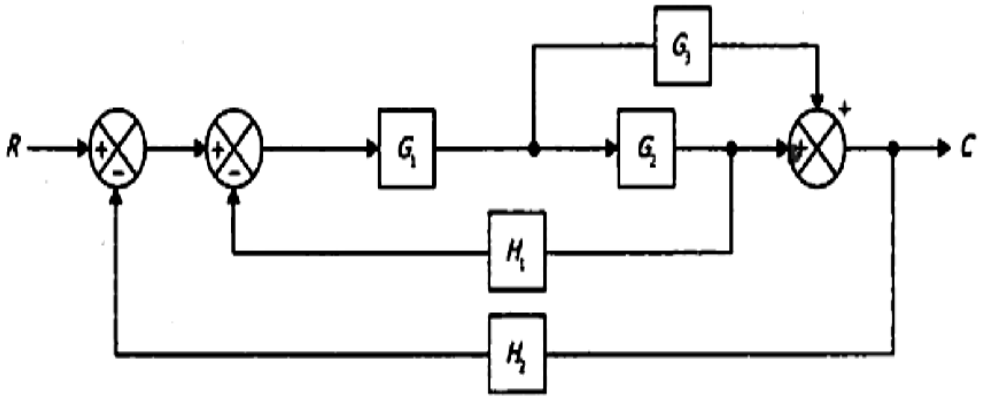
[Electrical and Electronics Engineering, Electronics and Communication Engineering]

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

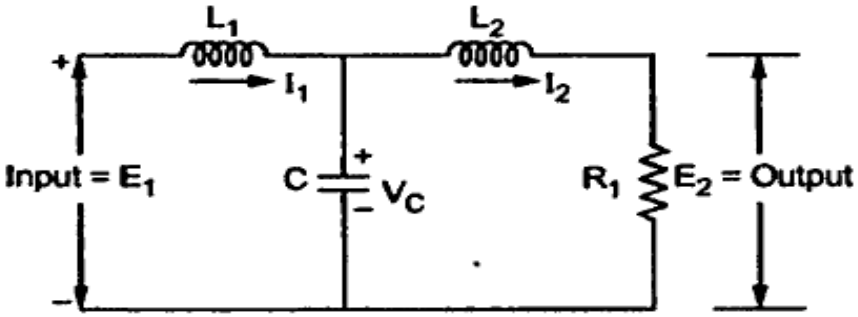
7	a)	What is compensator? Explain the design procedure for a lead compensator.	CO1	7 Marks
	b)	Derive the transfer function of PI controller and also explain how it affects steady state error in second order under damped system when subjected to unit ramp input.	CO6	7 Marks

(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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

TRANSMISSION AND DISTRIBUTION

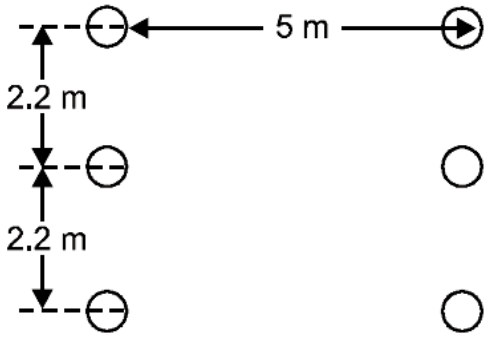
[Electrical and Electronics Engineering]

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

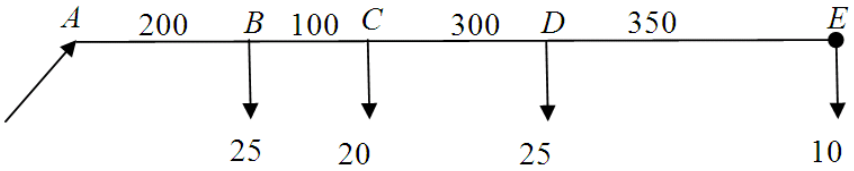
5	a)	A three phase 220kV, 50Hz transmission line consists of 1.2cm radius conductor spaced 2 meters apart in equilateral triangular formation. Find the disruptive critical voltage between the lines if the temperature is 20°C and atmospheric pressure is 72.2cm. Take m_o=0.96. Dielectric strength of air = 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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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: CO3 8 Marks

i) Work done per kg of air flow.
ii) Refrigerating effect per kg of air flow.
iii) Theoretical COP.

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: CO4 8 Marks

(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.

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***

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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

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

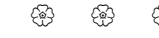
5	a)	Explain the CWR of I/O modes of operation of 8255 with neat sketches.	CO1	8 Marks
	b)	Draw and explain the Handshake mode of 8086 in detail with sketches.	CO1	6 Marks
		(OR)		
6		Describe the different registers of 8289 PIC with neat sketches.	CO2	14 Marks

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



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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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 ≤ 2 dB, Pass band edge frequency = 4KHz. Stop band attenuation ≥ 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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

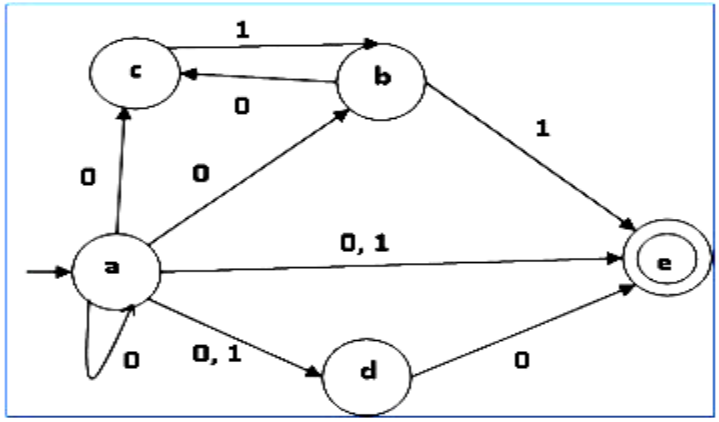
UNIT-I

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

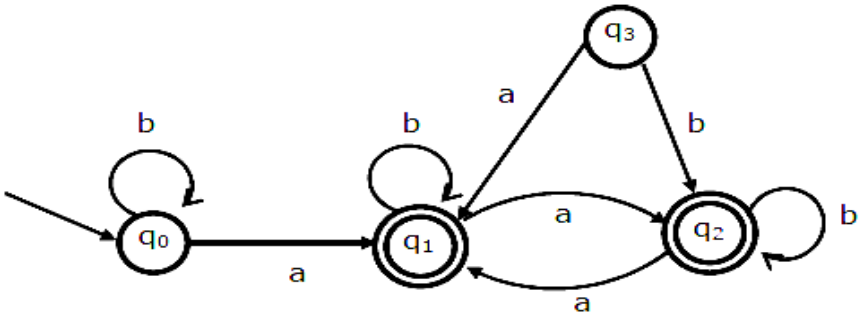


b) Differentiate NFA and DFA. CO2 4 Marks

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

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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: i) modular. ii) semi modular. iii) non-modular outlets with a neat sketch.	CO1	7 Marks

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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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/m², 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 mm². 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/m², and the floor finish weighs 0.6 kN/m². 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

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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.

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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

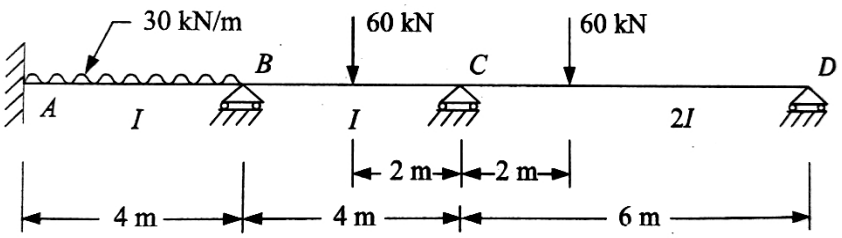

Fig.1

(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

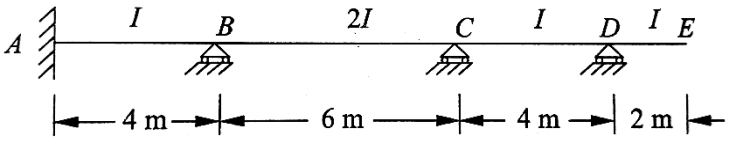

Fig.2

UNIT-III

5 Analyse the continuous beam shown in Fig.3 by Kani's method. CO4 14 Marks

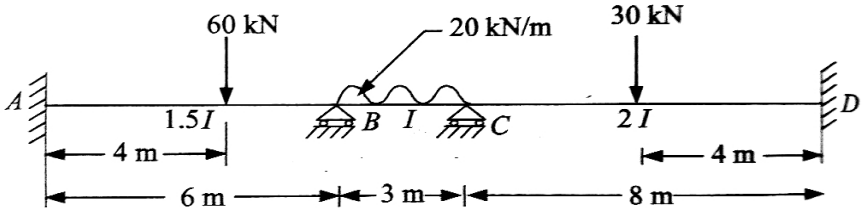

Fig.3

(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

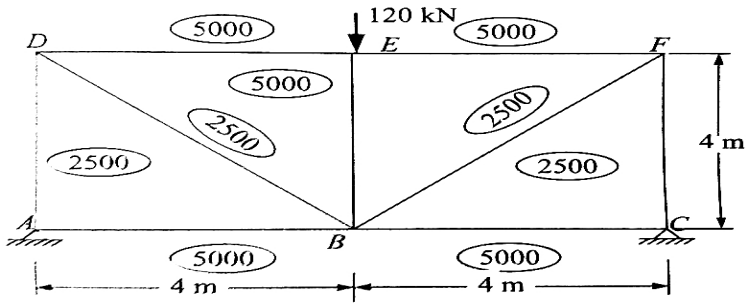

Fig.4

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

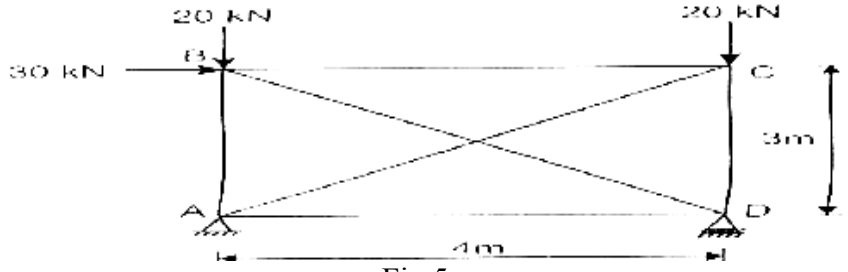

Fig.5

(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

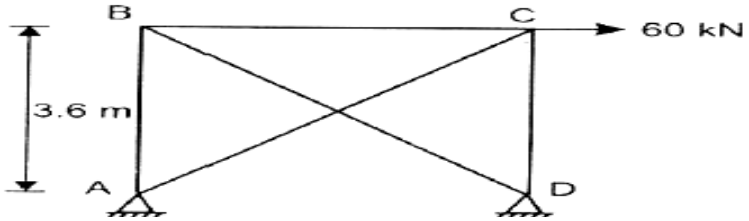

Fig.6

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

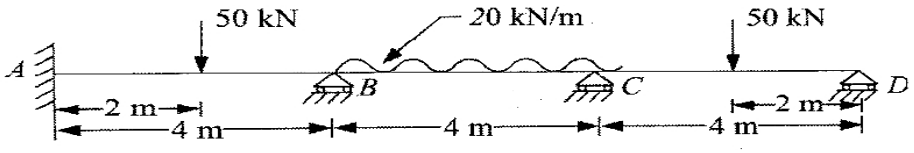

Fig.7

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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III B.Tech I Semester (SVEC16) Supplementary Examinations August – 2021

CONTROL SYSTEMS

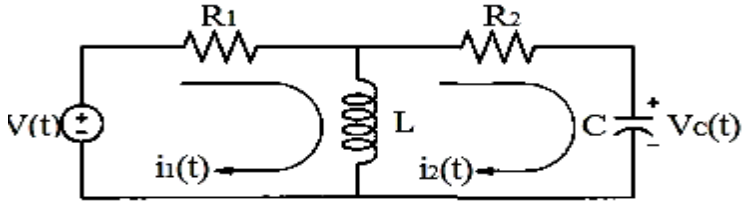
[Electrical and Electronics Engineering, Electronics and Communication Engineering]

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

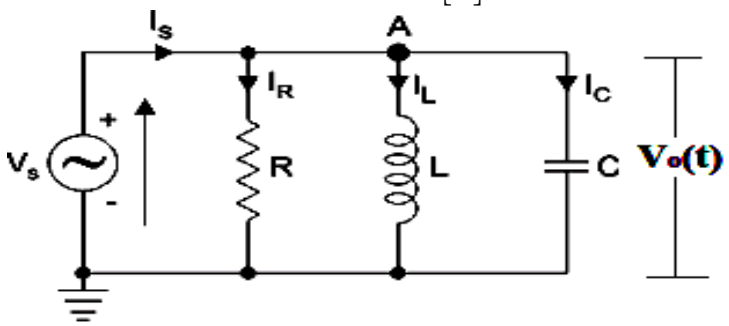
UNIT-IV

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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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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_I=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

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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.:14BT40503 SVEC-14

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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: 10 Marks

i) Graph coloring. ii) Hamiltonian cycles.

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

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: 14 Marks
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

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

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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

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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

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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

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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. 6 Marks

$V_{GS} = -5V$; $V_{tp} = -1.2V$; $W/L = 95$; $\mu_n C_{ox} = 95\ \mu A/V^2$

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. 8 Marks

F1 = M2. M3. M5
F2 = M0. M1. M4
F3 = M1. M2. M6. M7

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

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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

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CODE No.:14BT40501 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations March – 2021

COMPUTER ORGANIZATION

[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 register transfers and Register Transfer language with an example.	7 Marks
	b)	Interpret the binary division to an example -7/-3.	7 Marks
		(OR)	
2	a)	Discuss in detail logic micro operations.	7 Marks
	b)	Distinguish between floating point addition and subtraction using flowcharts.	7 Marks

UNIT-II

3	a)	Compare and contrast Micro programmed control unit and Hardwired control Unit.	7 Marks
	b)	Discuss in detail about computer instructions.	7 Marks
		(OR)	
4	a)	Write about Micro Programmed control unit in detail.	7 Marks
	b)	Distinguish between Micro programmed control unit and Hardwired control Unit.	7 Marks

UNIT-III

5	a)	Draw the block diagram of interface between a processor and peripheral devices and also explain its operations.	7 Marks
	b)	Compare interrupt driven data transfer scheme with DMA. Using block diagram explain interrupt driven transfer scheme.	7 Marks
		(OR)	
6		What is the basic advantage of using interrupt-initiated data transfer over transfer under programmed control without an interrupt? Explain interrupt-initiated I/O in detail.	14 Marks

UNIT-IV

7		What is the need for having a hierarchical memory organization and explain the same with a neat sketch.	14 Marks
		(OR)	
8	a)	Define basic terms Hit, Miss and miss penalty and explain how to compute performance of cache memory.	7 Marks
	b)	List different types of Main memories and compare them.	7 Marks

UNIT-V

9	a)	Explain instruction pipeline with an example.	7 Marks
	b)	Discuss the characteristics of multiprocessors.	7 Marks
		(OR)	
10	a)	Explain Inter Process Arbitration in detail.	7 Marks
	b)	An unpipelined processor has a cycle time of 25ns. What is the cycle time of a pipelined version of the processor with 50 evenly divided pipeline stages, if each pipeline latch has a latency of 1ns?	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations March – 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	a)	Write and explain the final algorithm for collapse Rule with an example.	7 Marks
	b)	Explain about various Asymptotic Notations.	7 Marks
		(OR)	
2	a)	Explain various constructs of Pseudo code to write an algorithm.	7 Marks
	b)	Write algorithms for Union to combine two sets.	7 Marks

UNIT-II

3	a)	Explain various Graph Traversal Search Techniques with an example.	7 Marks
	b)	What is biconnected Graph? Explain how to test a graph is biconnected or not.	7 Marks
		(OR)	
4		Write the algorithm for Binary Search using Divide and conquer technique and find its complexity.	14 Marks

UNIT-III

5	a)	Write the Control abstraction for Greedy method.	7 Marks
	b)	Write an algorithm to find out the single source shortest problem using Greedy method.	7 Marks
		(OR)	
6		Construct the Optimal Binary Search Tree using Dynamic Programming for the identifiers with N = 4 and (a_1, a_2, a_3, a_4) = (break, do, for, while), probabilities are P(1:4)=(3, 3, 1, 1) and probabilities for unsuccessful Q(0:4)=(2, 3, 1, 1, 1)	14 Marks

UNIT-IV

7	a)	Write an algorithm of M-coloring problem.	7 Marks
	b)	Solve the n-Queens problem using backtracking.	7 Marks
		(OR)	
8	a)	Write about Hamilton – Cycles.	7 Marks
	b)	Explain about FIFO Branch and Bound Solution.	7 Marks

UNIT-V

9	a)	Explain the classes of P and NP.	7 Marks
	b)	Explain the satisfiability problem and write the algorithm for the same.	7 Marks
		(OR)	
10	a)	Write a Non-deterministic algorithm for sorting.	7 Marks
	b)	Write a Non-deterministic algorithm to solve Knapsack problem.	7 Marks

CODE No.:14BT41201 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations March – 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)	Define constructor and explain rules for writing constructors and types of constructors with an example.	7 Marks
	b)	Explain method overloading in JAVA and write a java program to overload print method to print different data type values.	7 Marks
		(OR)	
2	a)	Explain type conversation and type casting with examples.	7 Marks
	b)	Write a java program to read six subject marks of a student and find the total and average of marks using arrays.	7 Marks

UNIT-II

3		Define inheritance and explain different kind of inheritance with a suitable example.	14 Marks
		(OR)	
4	a)	Explain super keyword in java with examples.	7 Marks
	b)	Describe abstract class with an example.	7 Marks

UNIT-III

5		Explain the life cycle of thread with a neat diagram.	14 Marks
		(OR)	
6		Specify the benefits of exception handling in java, write a java program to represent at least five exception handling concept.	14 Marks

UNIT-IV

7	a)	Explain life cycle of an applet.	7 Marks
	b)	Explain Layout managers and write a java program to create a login page using Flow Layout?	7 Marks
		(OR)	
8	a)	Write a java applet program to design a login page and when user click sign in button the entered username and password should be displayed on the applet window.	7 Marks
	b)	Explain Checkbox Group component and methods, event associated with it.	7 Marks

UNIT-V

9	a)	Explain life cycle of a servlet.	7 Marks
	b)	Explain ServletContext.	7 Marks
		(OR)	
10	a)	Explain ResultSet with an example jdbc program.	7 Marks
	b)	Explain javax.servlet.ServletRequest and javax.servlet.ServletResponse.	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations March – 2021

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)	With a neat block diagram, explain the architecture of 8086 Microprocessor.	7 Marks
	b)	Write an assembly language program for 8086 microprocessor to reverse a given string: "Microprocessors for IT".	7 Marks
		(OR)	
2	a)	Explain different addressing modes of 8086 microprocessor with suitable examples.	8 Marks
	b)	Explain the following string manipulation instructions of 8086 with suitable examples. i) MOVS. ii) LODS. iii) CMPS.	6 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)	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

UNIT-III

5	a)	Develop ALP to Initialize 8251A to send and receive characters on polled basis.	8 Marks
	b)	Differentiate synchronous to asynchronous serial transmission methods.	6 Marks
		(OR)	
6	a)	Reproduce 8255A control word formats and discuss the function of each bit in this format.	7 Marks
	b)	Show the setup to interface 8-channel ADC to Intel 8086.	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)	Explain briefly the arithmetic and logical instructions of Intel 8051.	7 Marks
	b)	Explain the interfacing between 8051 and an external memory with suitable diagrams.	7 Marks

UNIT-V

9	a)	Contrast Timer to Counter operation of 8051. Categorize different modes of operating Timers/Counters in 8051	7 Marks
	b)	Develop ALP to create a square wave of 50% duty cycle on P1.5. Assume XTAL=11.0592 MHz.	7 Marks
		(OR)	
10	a)	Discuss the interrupt structure of 8051. Mention the priority. Explain how least priority is made as highest priority.	9 Marks
	b)	List out the steps involved in programming the 8051 to transfer data serially.	5 Marks

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CODE No.:14BT60202 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations March – 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)	Explain the operation of IGBT in detail.	7 Marks
	b)	Compare SCR and GTO.	7 Marks
		(OR)	
2	a)	Explain how SCR is able to maintain conduction even after removal of gate pulse.	7 Marks
	b)	List and explain various turn on methods of SCR.	7 Marks

UNIT-II

3	a)	Explain the operation of single phase bridge type full-converter with RL load and sketch the associated waveforms for $\alpha = 120^0$.	7 Marks
	b)	A single phase fully controlled converter is supplied at 220V, 50Hz. Determine the average load voltage for purely resistive load when the firing angle is 45^0.	7 Marks
		(OR)	
4	a)	Derive an expression for average output voltage of a three phase three pulse rectifier with R-load.	7 Marks
	b)	Explain the operational differences between circulating and non-circulating current modes of a single phase Dual converter with R-load.	7 Marks

UNIT-III

5		Explain the operation of single phase ac voltage controller with RL load. Derive the expressions for rms value of load voltage and load current.	14 Marks
		(OR)	
6	a)	Illustrate the operation of single phase bridge type cycloconverter with RL load. Draw relevant waveforms.	10 Marks
	b)	Mention few limitations of cyclo converters.	4 Marks

UNIT-IV

7		Explain the working of type A chopper with suitable voltage and current waveforms. Give the complete time domain analysis of type A chopper.	14 Marks
		(OR)	
8	a)	Derive the expression for the output voltage of a step-up chopper and explain its control strategies.	7 Marks
	b)	A step-up chopper has input voltage of 220V and output voltage of 660V. If the Non-conducting time of thyristor chopper is 100 micro seconds, compute the pulse width of output voltage. In case pulse width is halved for constant frequency operation, find the new output voltage.	7 Marks

UNIT-V

9		Describe the working of a single phase full bridge inverter with relevant circuit and waveforms.	14 Marks
		(OR)	
10		Explain sinusoidal pulse modulation used for PWM inverters. Write the important features of the same.	14 Marks

CODE No.:14BT60301 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations March – 2021

DESIGN OF MACHINE ELEMENTS-II

[Mechanical Engineering]

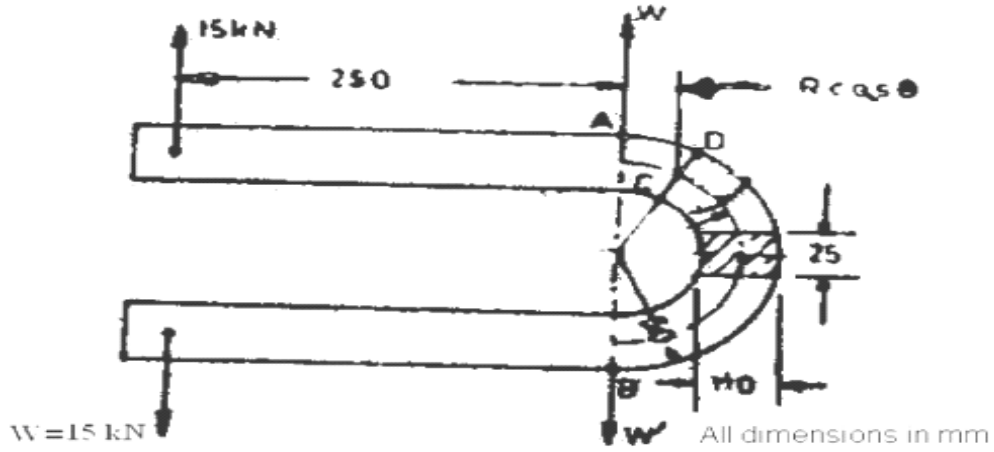
Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1 a) Derive an expression for radius of neutral axis for circular cross section. 4 Marks

b) A load of 10kN is applied to a steel curved beam as shown in the figure. Compute the increase in distance between the points A and B due to the load. Assume G = 0.84 x 105 N/mm^2, E = 2.10 x 105 N/mm^2. 10 Marks



(OR)

2 a) Derive an expression for radius of neutral axis for Trapezoidal cross section. 5 Marks

b) The section of a crane hook is a rectangle 60mm x 40mm. The center of curvature of the section is at a distance of 80mm from the centroid of the section. A load of 15kN is acting through the center of curvature. Determine the maximum and minimum bending stresses induced in the hook. 9 Marks

UNIT-II

3 a) What is journal bearing? Give its classifications. 6 Marks

b) A full journal bearing operating under steady load has the following specifications. 8 Marks

Journal diameter = 60mm; Bearing length = 60mm; Radial load on bearing = 2.8kN; Journal speed = 1020 r.p.m; Radial clearance = 0.05mm; Viscosity of oil = 80 x 10^{-9} N-s/mm^2; Density of oil = 860 kg/m^3; Specific heat of oil = 1.76 kJ/kg.^{0}C; Using Raimondi and Boyd data given in the table, determine:

i) Somerfield number.
ii) Power loss in friction.
iii) Minimum film thickness.

(OR)

4 a) What are the advantages of antifriction bearings? 3 Marks

b) A single-row deep groove ball bearing is subjected to an axial thrust load 1100 N and a radial load of 2100 N. Select the suitable bearing for an average life of 5 years with 8 hr/day. 11 Marks

UNIT-III

5 a) Discuss the design procedure of spur gears. 7 Marks

b) Design a spur gear drive required to transmit 45kW at a pinion speed of 800 r.p.m. The velocity ratio is 3.5**:** 1. The teeth are 20^0 full-depth involute with 18 teeth on the pinion. Both the pinion and gear are made of steel with a maximum safe static stress of 180 MPa. Assume a safe stress of 40 MPa for the material of the shaft and key. 7 Marks

(OR)

6 The following particulars of a single reduction spur gear are given: 14 Marks

Gear ratio = 10**:**1; Distance between centres = 660mm approximately; Pinion transmits 500kW at 1800 r.p.m.; Involute teeth of standard proportions (addendum = m) with pressure angle of 22.5^0; Permissible normal pressure between teeth = 175 N per mm of width.

Find : i) The nearest standard module if no interference is to occur.

ii) The number of teeth on each wheel.

iii) The necessary width of the pinion.

iv) The load on the bearings of the wheels due to power transmitted.

UNIT-IV

7 a) Derive the expression for the energy stored in helical springs of circular wire. 7 Marks

b) A close-coiled helical spring whose free length when not compressed is 15cm, is required to absorb strain energy is equal to 50N-m when compressed with the coils in contact. The maximum shearing stress limited to 140 MPa. Assuming a mean coil diameter of 10cm, find the diameter of the steel wire required and the number of coils. G = 80 GPa. 7 Marks

(OR)

8 a) Derive the expression of the deflection of helical springs of circular wire. 7 Marks

b) Design a helical compression spring for a maximum load of 1000 N for a deflection of 25mm using the value of spring index as 5. The maximum permissible shear stress for spring wire is 420 MPa and modulus of rigidity is $84kN/mm^2$. TakeWahl's factor, 7 Marks

$$K = \frac{4C-1}{4C-4} + \frac{0.615}{C}, \text{ where } C = \text{springindex}.$$

UNIT-V

9 Design the Overhung Crankshaft.

i) When the crank is at dead centre? 7 Marks

ii) When the crank is at an angle of maximum twisting moment? 7 Marks

(OR)

10 State the function of the following for an internal combustion engine piston: 14 Marks

i) Ribs. ii) Piston rings.

iii) Piston skirt. iv) Piston pin.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations March - 2021

OPERATIONS RESEARCH

[Mechanical Engineering]

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

Answer One Question from each Unit
All questions carry equal mark

UNIT-I

1 a) Explain various steps involved in the formulation of LPP. 7 Marks

b) Solve the solve the following LPP problem by graphical method. 7 Marks

$$Max\ Z = 2x_1 + 3x_2$$
$$st\ x_1 + x_2 \leq 30,$$
$$x_2 \geq 3\ ,\ x_2 \leq 12$$
$$x_1 - x_2 \geq 0,$$
$$0 \leq x_1 \leq 20$$

(OR)

2 Solve the LPP problem by Big M method: 14 Marks

$$Max\ Z = 4x_1 + 5x_2 - 3x_3 + 50$$
$$st\ x_1 + x_2 + x_3 = 10$$
$$x_1 - x_2 \geq 1$$
$$2x_1 + 3x_2 + x_3 \leq 40 \quad x_i \geq 0 \forall\ i$$

UNIT-II

3 a) Outline the steps for Hungarian method. 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: 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

(OR)

4 Find the optimal solution to the following transportation problem. 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) (i) Distinguish between PERT and CPM. 7 Marks

b) (ii) Maximal flow and shortest path techniques. 7 Marks

(OR)

6 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. 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-IV

7 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.

(OR)

8 A tourist car has 25 taxis in operation. He keeps 3 drivers as reserve to attend the calls in case the scheduled driver reports sick. The probability distribution of sick drivers is as follows: 14 Marks

Number of sick	0	1	2	3	4	5
Probability	0.1	0.15	0.10	0.15	0.22	0.28

Simulate for 10 days and estimate.

i) the utilization of reserve drivers.
ii) probability that at least one taxi will be off the road due to non-availability of a driver.

Take random numbers as 82, 89, 78, 24, 53, 61, 18, 45, 04, 23.

UNIT-V

9 Find the solution of the following Game 14 Marks

Player A		B_1	B_2	B_3
	A_1	15	2	3
	A_2	6	5	7
	A_3	-7	4	0

(OR)

10 What is decision making? Explain and differentiate this under the conditions of certainty and uncertainty. 14 Marks

CODE No.:14BT60303 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) 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 Derive general 3-D heat conduction equation in Cartesian coordinate system. 14 Marks

(OR)

2 a) Derive the heat conduction equation in cylindrical co-ordinates using an elemental volume for a stationary isotropic solid. 7 Marks

b) A 3cm OD steam pipe is to be covered with two layers of insulation each having a thickness of 2.5cm. The average thermal conductivity of one insulation is 5 times that of the other. Determine the percentage decrease in heat transfer if better insulating material is next to pipe than it is the outer layer. Assume that the outside and inside temperatures of composite insulation are fixed. 7 Marks

UNIT-II

3 a) A hallow sphere 10cm ID and 30cm OD of a material having thermal conductivity 50 W/mK is used as s container for a liquid chemical mixture. Its inner and outer surface temperatures are 300^0C and 100^0C respectively. Determine the heat flow rate through the sphere. Also estimate the temperature at a point a quarter of the way between the inner and outer surfaces. 7 Marks

b) Explain the following: 7 Marks

i) Efficiency of fin. ii) Effectiveness of fin.

(OR)

4 a) Define lumped heat analysis. 4 Marks

b) A stainless steel rod of outer diameter 1cm originally at a temperature of 320^0C is suddenly immersed in a liquid at 120^0C for which the convective heat transfer coefficient is $100W/m^2K$. Determine the time required for the rod to reach a temperature of 200^0C. 10 Marks

UNIT-III

5 Air at 20^0C flows over a flat plate having a uniform heat flux of $800W/m^2$. The flow velocity is 4m/s and the length of the plate is 1.2m. 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 27^0C enters a triangular duct that is 20mm on a side and 2m long. The duct surface is maintained at 100^0C. 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) State the different types of boiling and explain with neat sketch the different stages in pool boiling heat transfer. 8 Marks

b) An electric wire of 1.5mm diameter and 200mm long is laid horizontally and submerged in water at atmospheric pressure. The wire has an applied voltage of 16 V and carries a current of 40 amperes. Calculate: 6 Marks

i) the heat flux. ii) the excess temperature.

(OR)

8 a) Sketch the temperature variation in parallel flow and counter flow heat exchangers. 5 Marks

b) In a double pipe counter flow heat exchanger 10000 kg/h of an oil having a specific heat of 2095 J/kg K is cooled from 80^0C to 50^0C by 8000 kg/h of water entering at 25^0C. Determine the heat exchanger area for an overall heat transfer coefficient of 300 W/m^2K. 9 Marks

UNIT-V

9 A truncated cone has top and bottom diameters of 20cm and 10cm respectively and a height of 10cm. 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) Define emissivity, absorptivity and reflectivity. 6 Marks

b) Two large parallel plates are kept at 1000^0C and 500^0C 8 Marks

i) Determine heat radiated.

ii) If the respective emissivities are 0.7 and 0.4, determine heat radiated.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations March – 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)	Derive the relationship between λg, λc and λo in a waveguide.	7 Marks
	b)	A rectangular waveguide with dimensions 4 x 2cms 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 x 1cm, the frequency is 8.6GHz. Find the following. i) Possible modes. ii) Cut-off frequency. iii) 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)	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
		(OR)	
6	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

UNIT-IV

7	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)	
8	a)	Explain the construction and working of a cylindrical magnetron.	7 Marks
	b)	Define the Hull cut-off condition. Distinguish between TWT and Magnetron.	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		Explain about: i) IMPATT diode. b) TRAPATT diode.	14 Marks

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations March – 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)	List the main steps carried in a typical n-well process and discuss briefly.	8 Marks
	b)	Determine Zpu /Zpd for NMOS inverter driven by another inverter	6 Marks
		(OR)	
2	a)	Differentiate the p-well CMOS process from n-well CMOS process.	7 Marks
	b)	Explain the n-well CMOS process to fabricate the n-switches.	7 Marks

UNIT-II

3	a)	Drive an expression for rise time, fall time of CMOS inverter.	6 Marks
	b)	Give the stick diagram of both NMOS and CMOS inverter.	8 Marks
		(OR)	
4	a)	Draw the stick diagram for the function $Y = (A + B + C)^1$.	7 Marks
	b)	Draw the layout diagram for 2 input NOR gate.	7 Marks

UNIT-III

5	a)	Discuss the working principle of booth multiplier with an example.	6 Marks
	b)	Explain the CMOS system design based on the data path operators with a suitable example.	8 Marks
		(OR)	
6	a)	Design a 4 x 4 Booth multiplier and explain its operation with suitable example.	8 Marks
	b)	Explain the operation of parity generators with neat circuit diagram.	6 Marks

UNIT-IV

7	a)	Explain the architecture of an FPGA with a neat sketch.	7 Marks
	b)	Explain CPLD with neat diagram and list out its applications.	7 Marks
		(OR)	
8	a)	Explain about standard cell based design.	7 Marks
	b)	PAL - 22V10 PAL architecture.	7 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 Data path test scheme for chip level test methods.	7 Marks
	b)	Explain how controllability and observability are used to test the CMOS circuits.	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech II Semester (SVEC14) Supplementary Examinations March – 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)	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)	Explain clearly about pre-emphasis and de-emphasis in FM wave.	7 Marks
	b)	Explain the difference between DSB and SSB system.	7 Marks
		(OR)	
4	a)	With necessary equations, explain the generation of NBFM using narrow band PM generator.	7 Marks
	b)	Explain the comparisons between FM and AM techniques.	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 technqiues.	7 Marks

UNIT-IV

7	a)	Explain about PSK, QPSK.	7 Marks
	b)	Explain the working of Coherent and non coherent PSK.	7 Marks
		(OR)	
8	a)	A bit stream 1011111011 is to be transmitted using ASK, FSK and PSK techniques. Draw the waveforms for the above mentioned digital modulation techniques.	7 Marks
	b)	What are the drawbacks of DM? Explain in detail how can you overcome by using ADM.	7 Marks

UNIT-V

9	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
		(OR)	
10	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

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

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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**	CO4	7 Marks

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?

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

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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

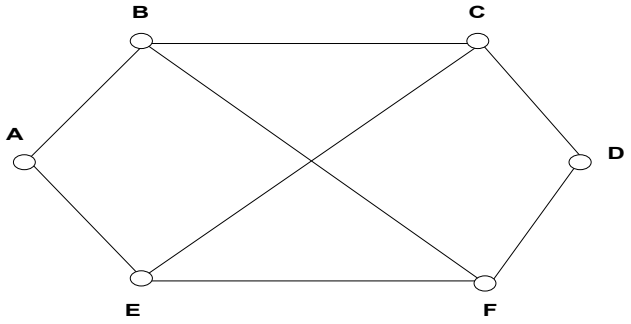
1.		During the communication, how various layers of OSI model exchange information to establish a connection? Justify this with a suitable diagram.	CO1	14 Marks
		(OR)		
2.	a)	Explain how the information gets passed from one layer to the next in the TCP/IP model.	CO2	7 Marks
	b)	Compare network topologies 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

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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

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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

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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.

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

ADVANCED STRUCTURAL ANALYSIS

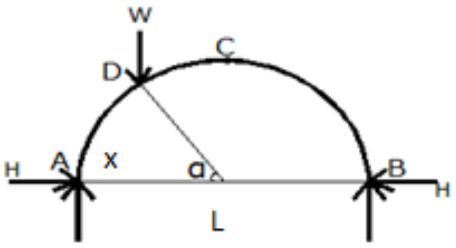
[Civil Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

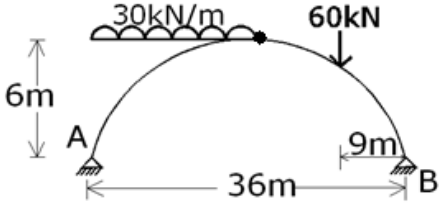
UNIT-I

1.	a)	Explain in detail. i) Effects of yielding of supports in arches. ii) Rib shortening and temperature changes in the arches.	CO1 CO2	7 Marks
	b)	Find the horizontal thrust of a two hinged arch subjected to concentrated load as shown below.	CO4	7 Marks



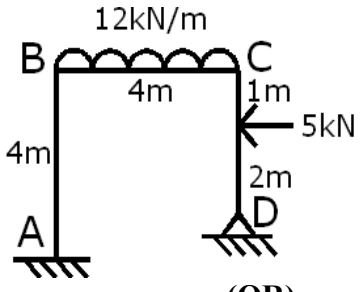
(OR)

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



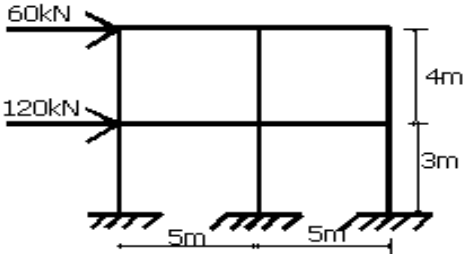
UNIT-II

3.		Analyse the below portal frame by moment distribution method.	CO4	14 Marks



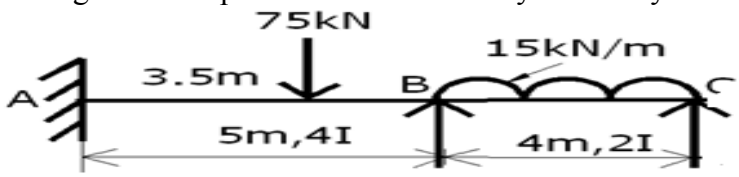
(OR)

4.		Analyze the following portal frame by portal method. Draw BMD	CO4	14 Marks



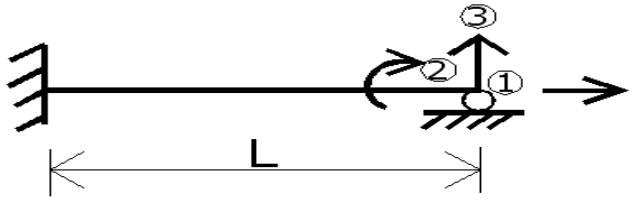
UNIT-III

5. Analyze the given two span continuous beam by flexibility method. CO3 14 Marks



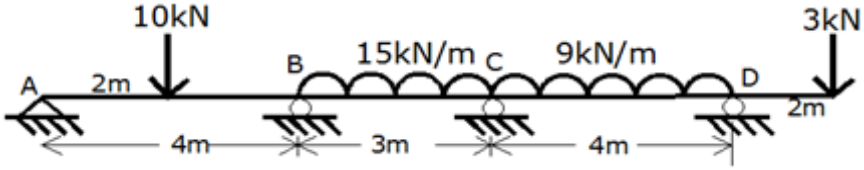
(OR)

6. For the simply supported beam shown below, develop the flexibility matrix with reference to the coordinates as specified. CO2 14 Marks



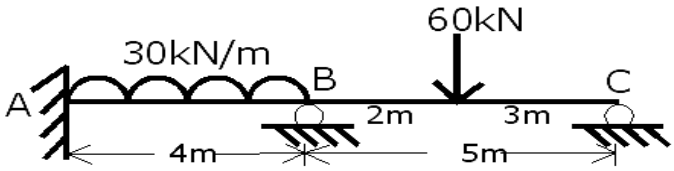
UNIT-IV

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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

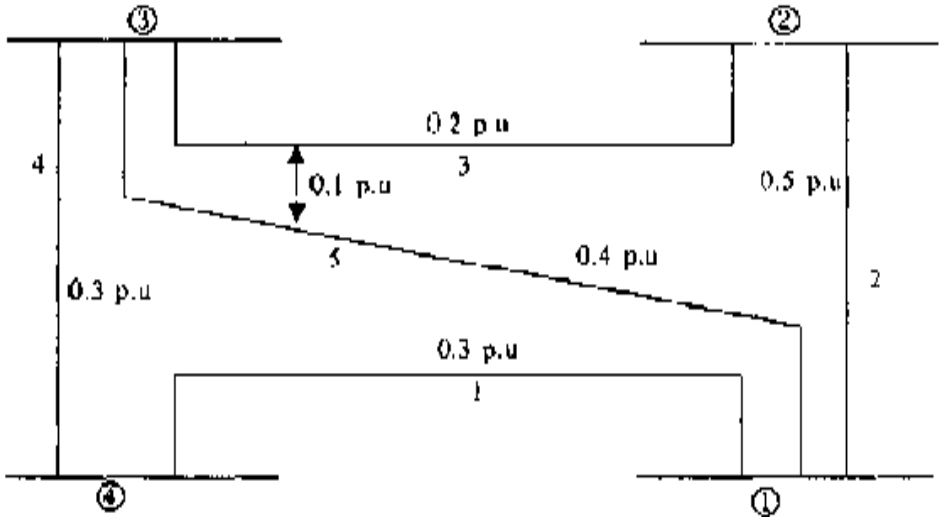
b) Define the per unit value of a quantity. How will you change the base impedance from one set of base values to another set? CO1 7 Marks

(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

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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

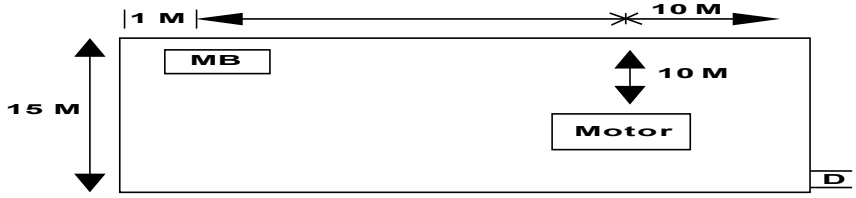
(OR)

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

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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 $H(e^{j\omega}) = j\omega$, $-\pi \le \omega \le \pi$ 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

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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

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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

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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

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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

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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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

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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

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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

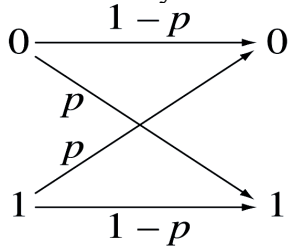
1.	a)	Consider a discrete memory less source with source probabilities {0.35, 0.25, 0.20, 0.15, 0.10}. Find the following: i) Calculate amount of information gained by observing the source emitting each of these symbols. ii) Calculate source entropy.	CO1	4 Marks
	b)	Consider the following source: S = (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.	CO1	10 Marks

(OR)

2.	a)	Apply the Huffman coding procedure for the following message ensemble: $[X] = [\, x_1 \quad x_2 \quad x_3 \quad x_4 \quad x_5 \quad x_6 \quad x_7 \quad x_8 \,]$ $[P] = [0.25 \quad 0.125 \quad 0.625 \quad 0.62 \quad 0.625 \quad 0.25 \quad 0.625 \quad 0.125]$ Estimate code efficiency and redundancy.	CO1	7 Marks
	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: i) Lossless. ii) Deterministic. iii) Noiseless. iv) Binary Symmetric Channel.	CO2	7 Marks
	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

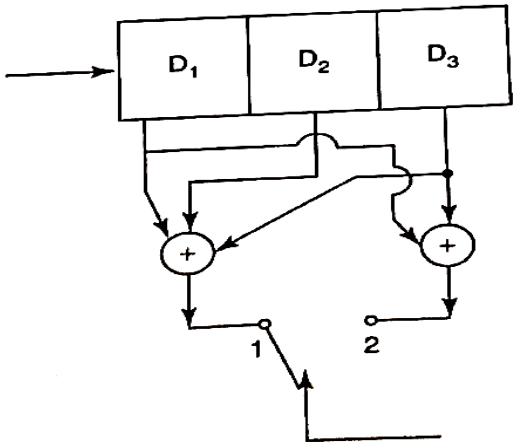
i) Draw its encoder diagram.

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.

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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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

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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

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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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

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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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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

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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.

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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

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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

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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

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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

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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]

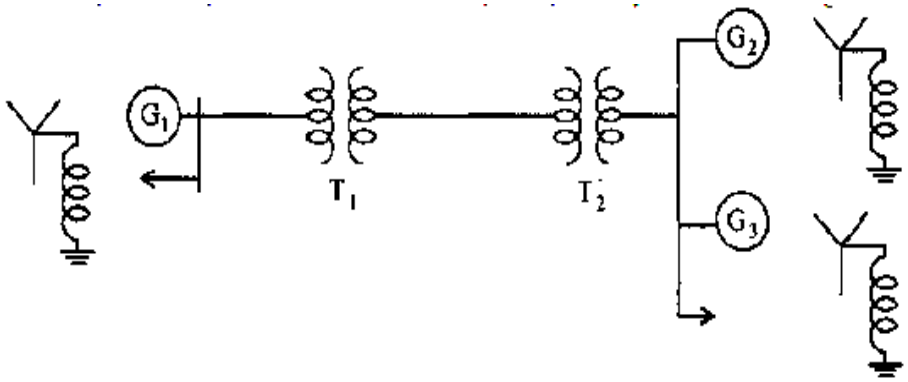
Time: 3 hours **Max. Marks: 70**

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

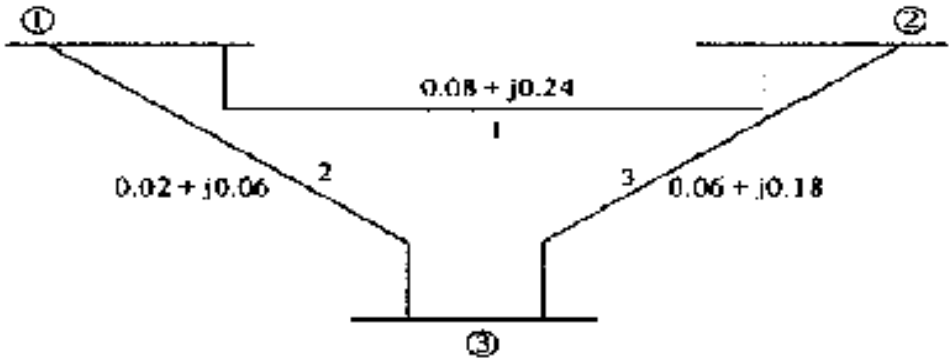
(OR)

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

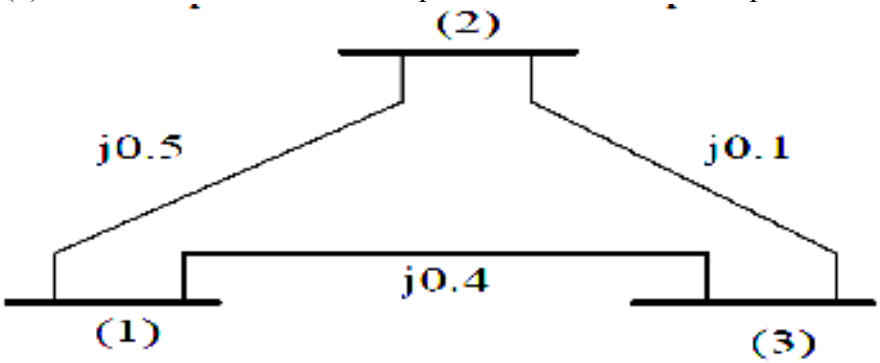
3. a) For the 3-bus system shown in the figure, Obtain Z_{BUS}. CO3 7 Marks



   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

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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**

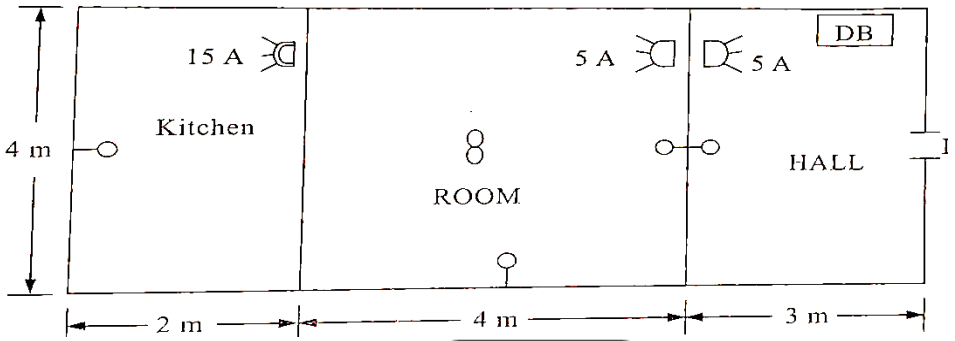
Answer One Question from each Unit
All questions carry equal marks

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

CODE No.: 16BT60204 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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. i) $y(n) = x(n) + x^2(n-1)$. ii) $y(n) = x(2n)$. ii) $y(n) = ax(n) + bx(n-1)$. iv) $y(n) = \|x(n)\|$.	CO2	12 Marks
	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 $H_d(e^{jw}) = 1$ 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.	CO3	14 Marks

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 ^{0}C, loss dissipation due to convection=6.5 W/m^2 ^{0}C, improvement in convection due to provision of tubes = 40%, temperature rise = 40^{0}C, 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 = 1.25Wb/m^2, The current density in the conductor = 2.5A/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

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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

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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 $V_pV_g=V_c^2$.	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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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.

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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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

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

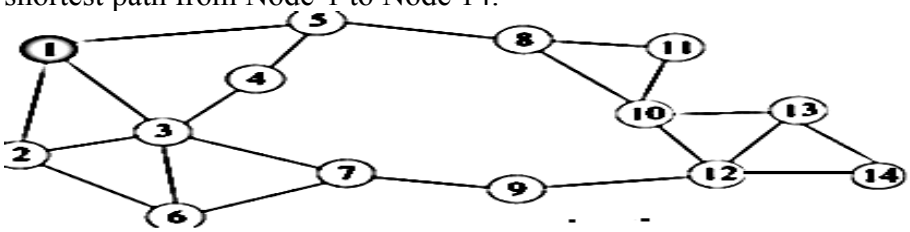
5.	a)	Explain the basic purpose of DHCP. Name the entities of DHCP. How can DHCP be used for mobility and support of mobile IP?	CO1	7 Marks
	b)	Discuss the advantages and disadvantages of three encapsulation methods in mobile IP.	CO1	7 Marks
		(OR)		
6.	a)	Explain the concept of Indirect TCP. How it 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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

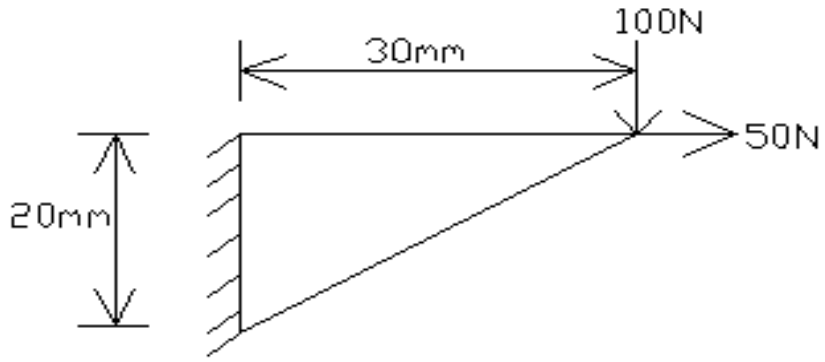

Fig. 1

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

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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

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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

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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

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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

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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

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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

$$\frac{dc_1}{dp_{g_1}} = 0.12P_{G1} + 30Rs/MWh$$

$$\frac{dc_2}{dp_{g2}} = 0.2P_{G2} + 40.0Rs/MWh$$

$$\frac{dc_3}{dp_{g3}} = 0.15P_{G3} + 10Rs/MWh$$

$30 \le P_{G1} \le 150$ $20 \le P_{G2} \le 100$ $50 \le P_{G3} \le 250.$

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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

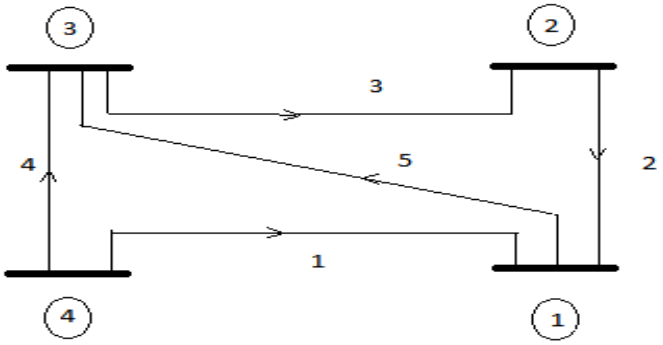

fig (1)

(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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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.

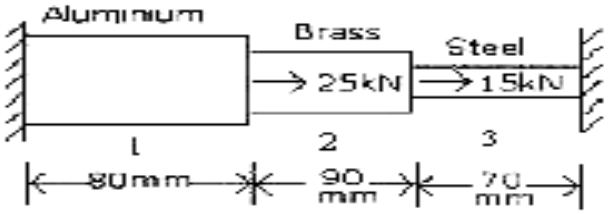


Fig .1

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.

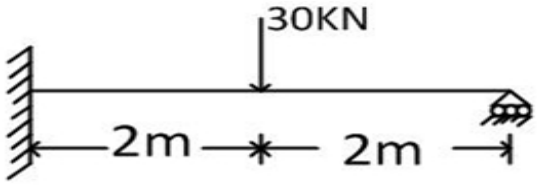


Fig.2

(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

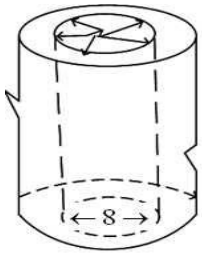


Fig.3

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)

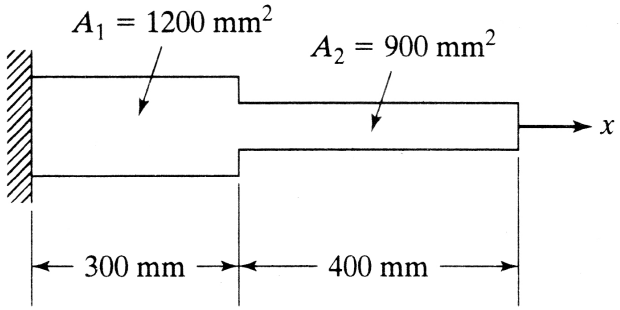
8 Discuss the formulation of 4-noded iso parametric element and derive the stiffness matrix for it. 14 Marks

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.

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

$IC_1=20+0.3P_1 \quad IC_2=30+0.4P_2 \quad IC_3=30.$

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

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

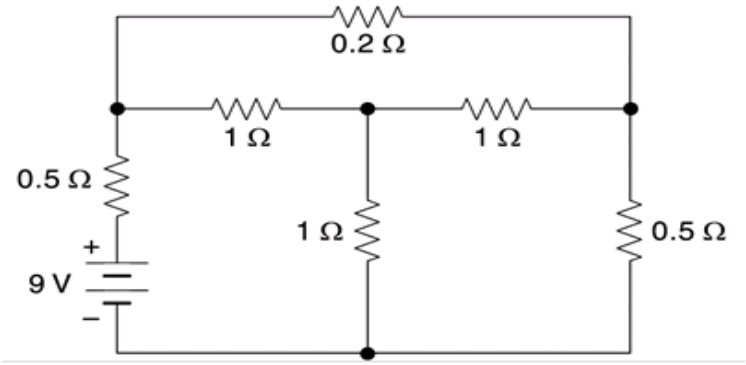

Fig. 1

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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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.: 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: CO4 7 Marks

   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?

(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

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CODE No.: 16BT6HS11 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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CODE No.: 16BT50501 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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.

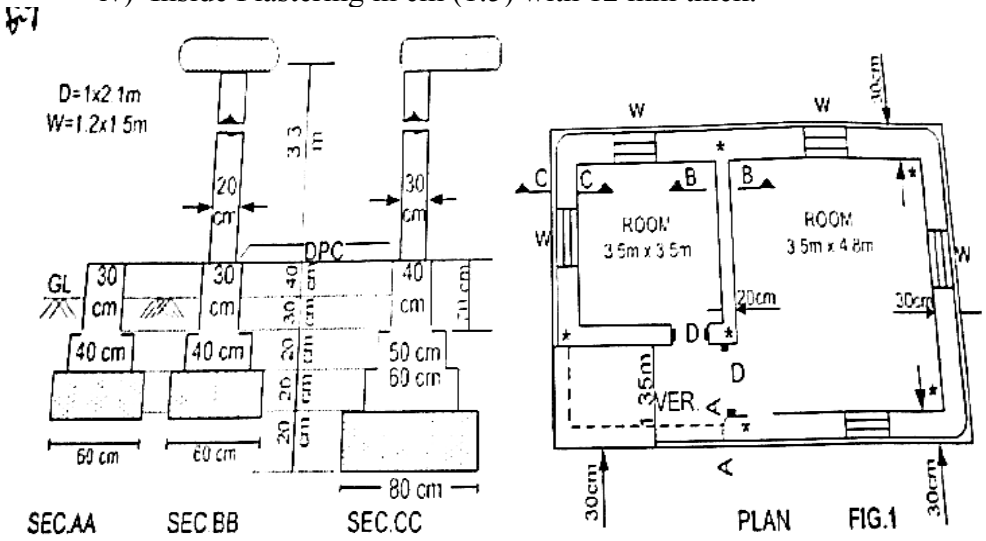

Fig. 1

(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

CODE No.: 16BT70104 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

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

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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. Maximize $\mathbf{Z = 2x_1 + 3x_2}$ Subjected to constraints $\mathbf{2x_1+x_2 \leq 2}$ $\mathbf{3x_1+4x_2 \geq 12}$ $\mathbf{x_1, x_2 \geq 0}$	CO4	7 Marks

(OR)

4.		Solve the following LPP. Maximize $\mathbf{Z = x_1 + 4x_2}$ Subjected to constraints $\mathbf{3x_1 + x_2 \leq 3}$ $\mathbf{2x_1 + 3x_2 \leq 6}$ $\mathbf{4x_1 + 5x_2 \geq 20}$ $\mathbf{x_1, x_2 \geq 0}$	CO4	14 Marks

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

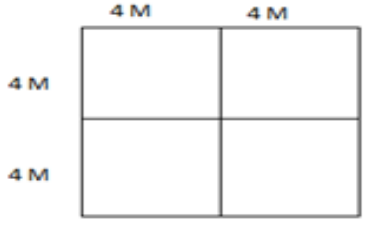
3.		Derive the equation of motion of SDOF system for free vibration and find the solution for: i) Under damped system. ii) Over damped system. iii) Critically damped system.	CO2	14 Marks

(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

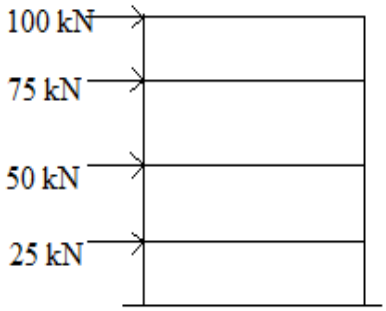
(OR)

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

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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

CODE No.: 16BT70120 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

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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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.

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

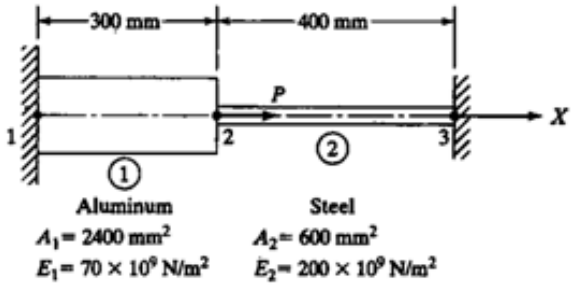

Fig.1

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

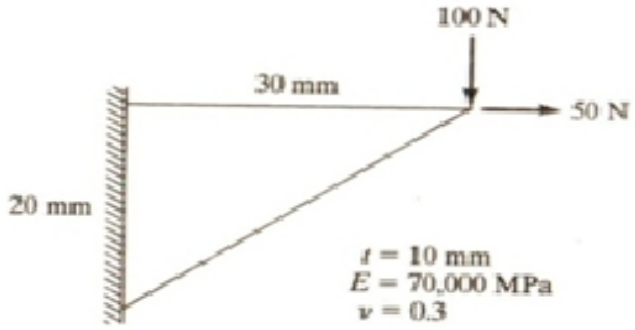

Fig.2 .

(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

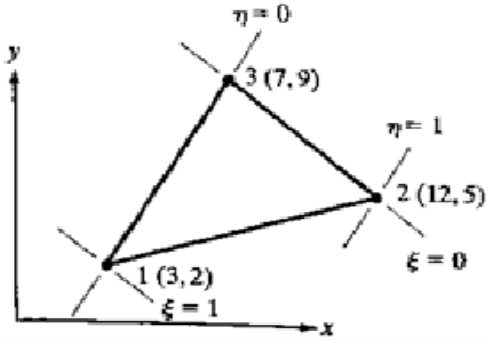

Fig.3

(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

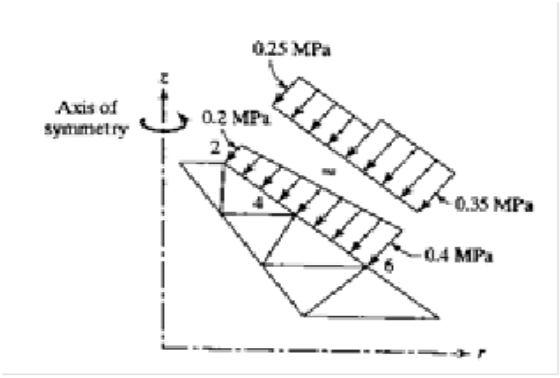

Fig.4

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^{2}K. CO4 14 Marks

UNIT-V

9.		Determine the Eigen values and Eigen vectors for the stepped bar shown in Fig.5.	CO5	14 Marks

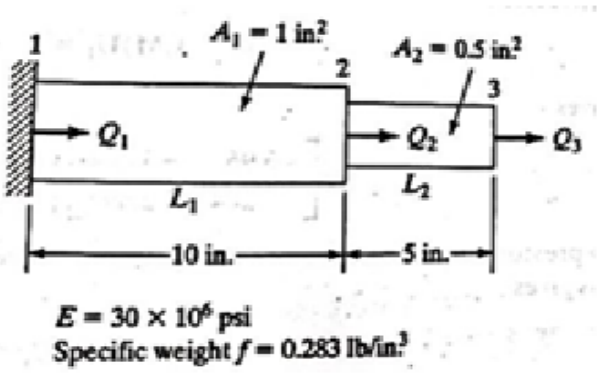

Fig.5.

(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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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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

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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

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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

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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

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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

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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) 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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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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

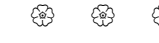
5.	a)	List the steps involved in deriving test cases using cause effect graphing based testing.	CO2	7 Marks
	b)	Derive the test cases for the following scenario. "A program has been designed to determine the nature of roots of a quadratic equation. The quadratic equation takes three input values from 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



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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

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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

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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

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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.

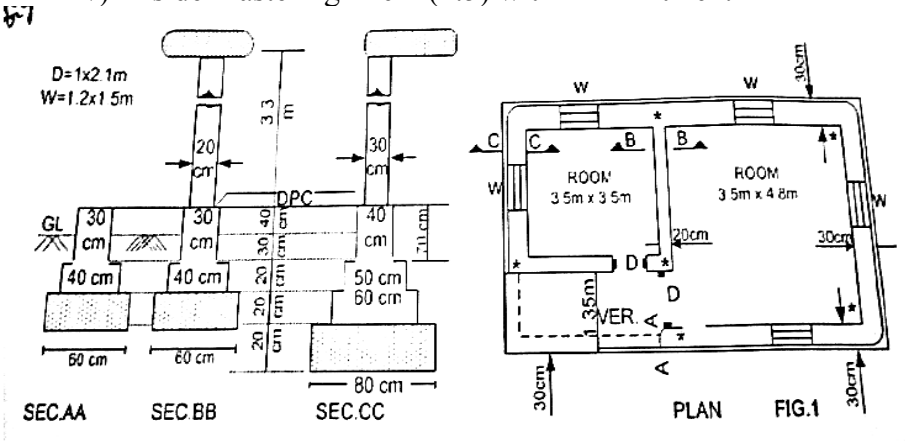


Fig. 1

(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.

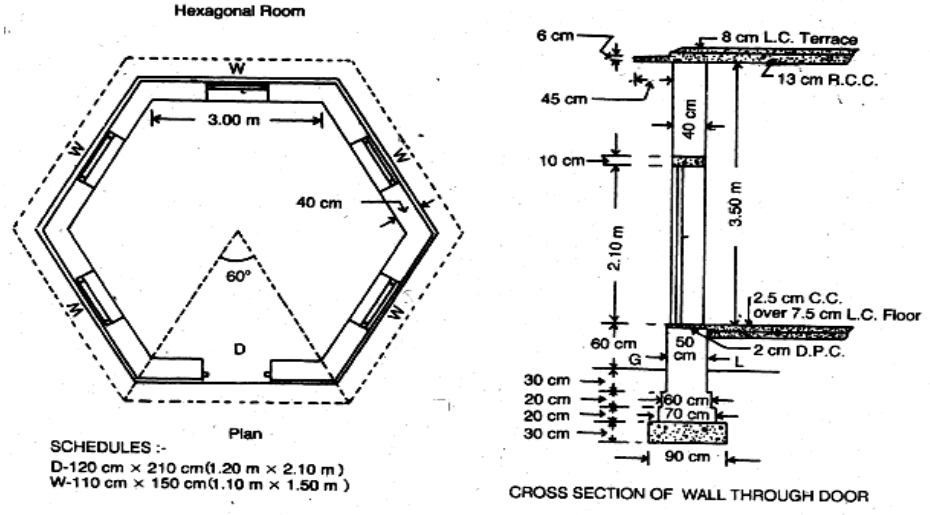
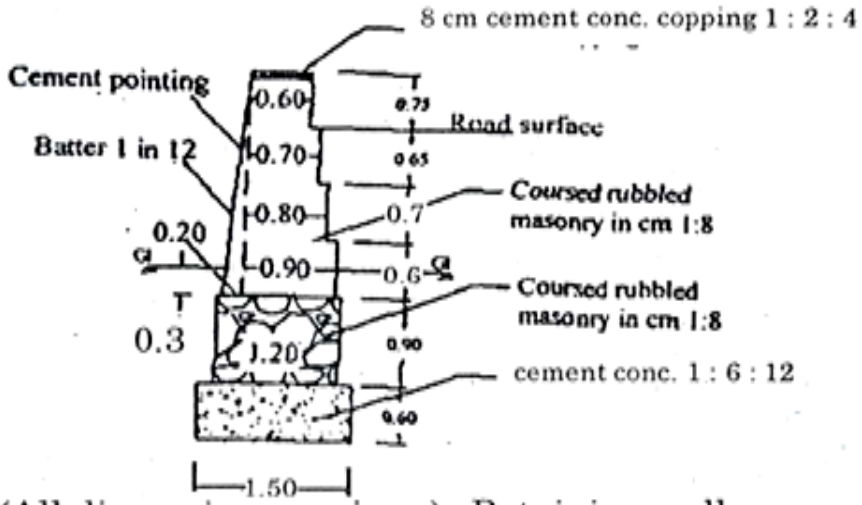


Fig. 2

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

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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

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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

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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**

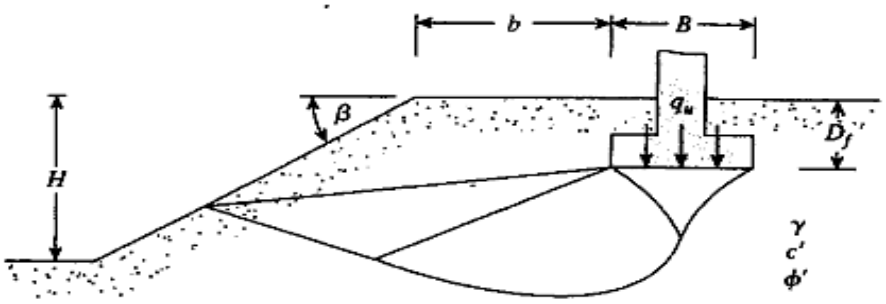
Answer One Question from each Unit
All questions carry equal marks

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)

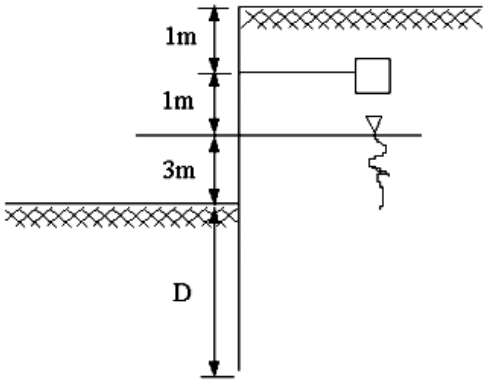
4.	a)	Discuss the evaluation of lateral resistance of rigid and flexible piles.	CO1	6 Marks
	b)	A friction pile group is carrying a load of 3000 kN including the weight of the pile cap at a site where the soil is uniform clay to a depth of 20 m, underlain by rock. The clay may be assumed to be of normal 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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

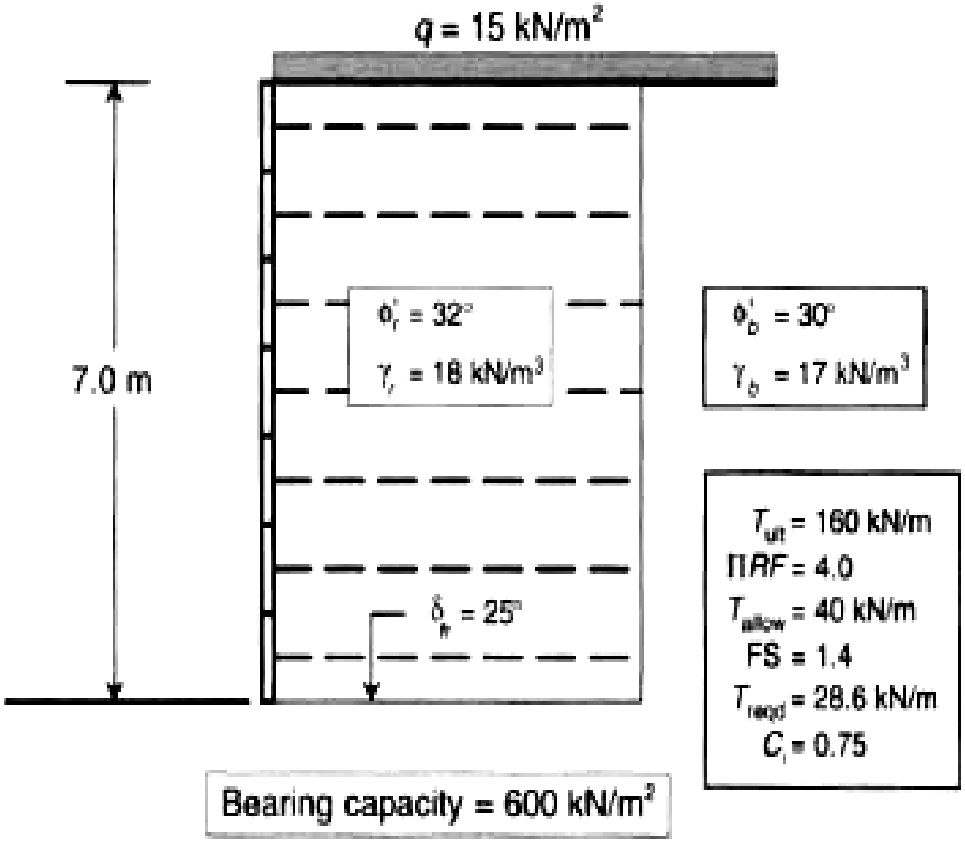
7.	a)	What are the various soil stabilization techniques? Write their suitability with respect to the soil type.	CO1	7 Marks
	b)	Write short notes on: i) Pre-grout investigation. ii) Post grout test. iii) Grout holes pattern. iv) Selection of grout characteristics.	CO1	7 Marks
		(OR)		
8.	a)	Describe 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



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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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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

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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

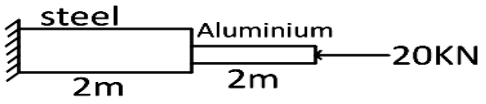
UNIT-I

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)

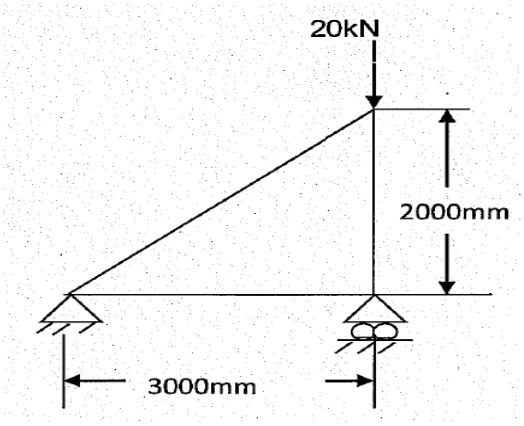
2. For the bar assemblages shown in figure, determine the nodal displacements, element stresses and support reactions. CO1 14 Marks



$E_{st}=200Gpa$
$A_{st}=4*10^{-4}m^2$
$E_{al}=70Gpa$
$A_{al}=2*10^{-4}m^2$

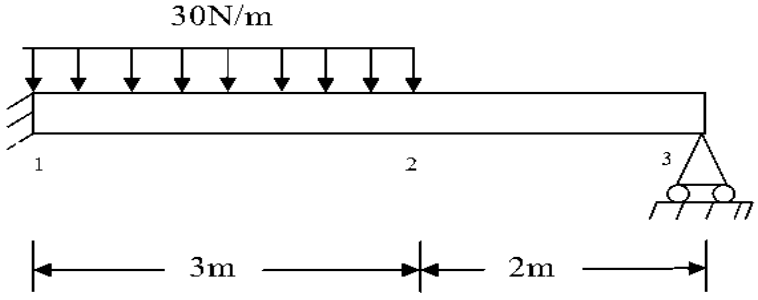
UNIT-II

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

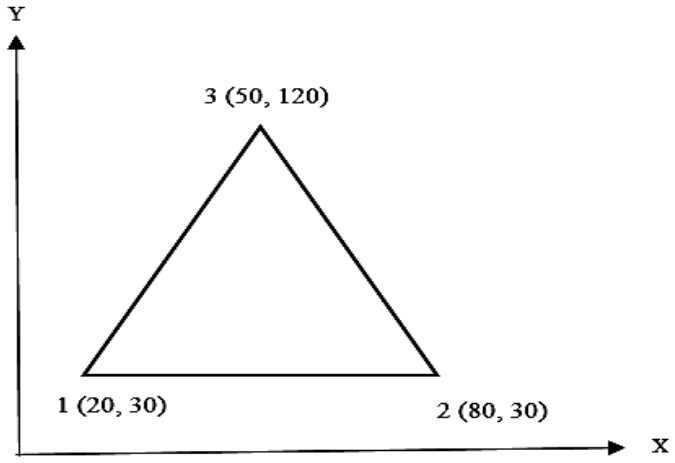


UNIT-III

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 $\mu = 0.3$. CO3 14 Marks

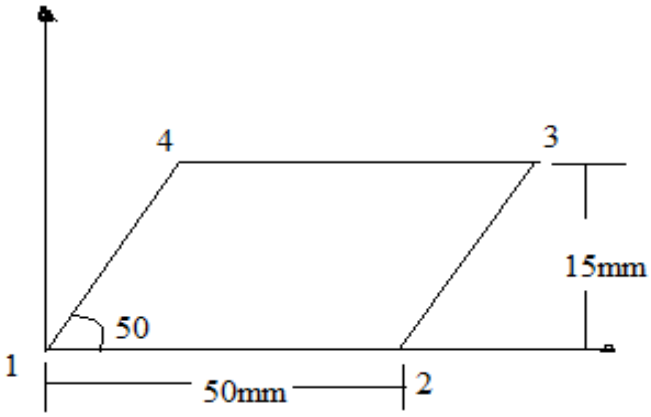
(OR)

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



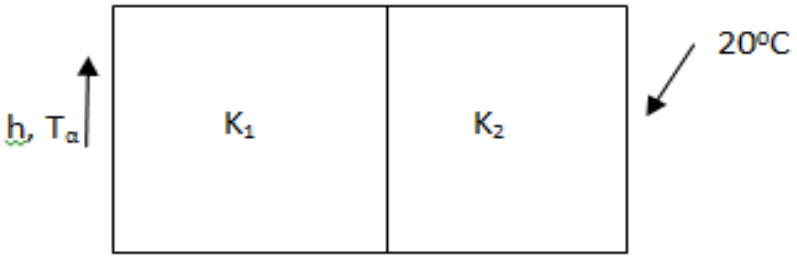
UNIT-IV

7. Consider a quadrilateral element as shown in fig the local coordinates are $\xi = 0.5$, $\eta = 0.5$. Evaluate Jacobin matrix and strain- Displacement matrix. CO1 14 Marks



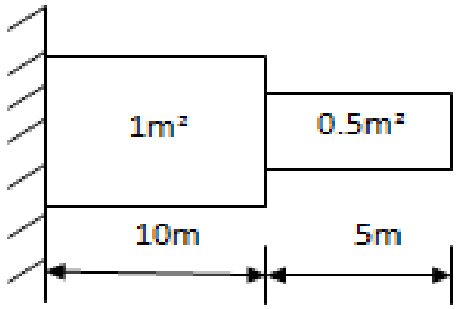
(OR)

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, $T\alpha = -5^0C$, 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

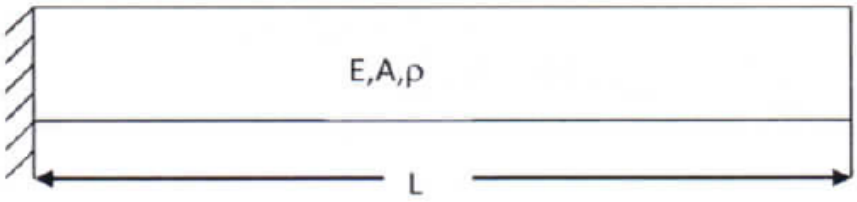


$\rho = 7850\ Kg/m^3$

$E = 30 \times 10^6\ N/m^2$

(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



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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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 CO2 7 Marks

$$g(n) = \begin{cases} na^n & n \geq 0 \\ 0 & otherwise \end{cases}$$

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 $H(Z) = \dfrac{G}{1 - \sum_{K=1}^{P} A_K Z^{-K}}$. 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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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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

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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

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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.:14BT80202 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech II Semester (SVEC14) Supplementary Examinations June - 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)	Explain the advantages of HVDC transmission over EHV-AC transmission for transmitting power from point to point.	CO1	7 Marks
	b)	Draw and explain the converter bridge characteristics of rectifier and inverter configurations from its equivalent circuits.	CO2	7 Marks
		(OR)		
2	a)	Draw a schematic diagram of a 12 pulse converter circuit, AC current waveform and list the different modes of operation.	CO2	8 Marks
	b)	Discuss the technical considerations for reliable operation of HVDC transmission.	CO1	6 Marks

UNIT-II

3	a)	Explain in detail about individual phase control firing scheme. Also mention the drawbacks of this scheme.	CO2	7 Marks
	b)	What are the adverse effects of harmonics produced by the HVDC converters?	CO2	7 Marks
		(OR)		
4	a)	Discuss about the principles of DC link control.	CO1	7 Marks
	b)	Discuss the need for reactive power control in HVDC power stations.	CO1	7 Marks

UNIT-III

5	a)	Explain power flow in AC transmission system and with parallel paths and meshed connections.	CO1	8 Marks
	b)	Discuss the need of transmission interconnections.	CO3	6 Marks
		(OR)		
6	a)	Define the following. i) FACTS. ii) FACTS Controller.	CO1	6 Marks
	b)	Discuss basic types of FACTS controllers with a neat sketch.	CO1	8 Marks

UNIT-IV

7	a)	Explain basic operating principle of STATCOM with neat sketch and discuss its characteristics.	CO1	8 Marks
	b)	Discuss comparisons between shunt compensators.	CO1	6 Marks
		(OR)		
8	a)	Discuss basic operating control scheme for SSSC.	CO2	7 Marks
	b)	Explain operating principle and characteristics of TCSC with neat sketch.	CO1	7 Marks

UNIT-V

9	a)	Explain control scheme of inter line power flow controller in detail.	CO1	7 Marks
	b)	Explain the role of UPFC in real and reactive power flow control.	CO1	7 Marks
		(OR)		
10	a)	Explain basic operating principle of UPFC with neat block diagram.	CO1	7 Marks
	b)	Write short notes on generalized and multidimensional FACTS controller.	CO1	7 Marks

CODE No.:14BT80302 SVEC-14

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech II Semester (SVEC14) Supplementary Examinations June - 2021

MECHATRONICS

[MECHANICAL ENGINEERING]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		Describe the role of mechatronics systems in production and manufacturing process with an application.	CO1	14 Marks
		(OR)		
2		With neat sketch, explain data conversion process with the help of signal conditioner. List out the ideal characteristics of operational amplifier.	CO2	14 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	a)	Explain the following. i) Notch filter. ii) Low pass filter. iii) Band stop filter.	CO3	9 Marks
	b)	Discuss the functional operation of circuit breaker with schematic diagram.	CO3	5 Marks
		(OR)		
6	a)	Explain the working principle of transistor with a schematic diagram.	CO3	6 Marks
	b)	Discuss about Discrete Fourier Transformations (DFT) used in signal processing.	CO3	8 Marks

UNIT-IV

7	a)	Explain the working principle of DA converter 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		Demonstrate the architecture of 8051 micro controller with a neat sketch and discuss its applications	CO3	14 Marks

UNIT-V

9		Design a system involving a PLC for the coin-operated barriers for a car park.	CO4	14 Marks
		(OR)		
10	a)	Explain about the working principle of PID controller with a neat sketch.	CO3	7 Marks
	b)	Explain different types of Control modes.	CO1	7 Marks

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech II Semester (SVEC14) Supplementary Examinations June - 2021

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 about the Non-Ideal Effects in Switched Capacitor circuits.	CO1	7 Marks
	b)	Design a switch capacitor realization for a first order, high pass circuit with a high frequency gain of -10 and a -3dB frequency of 1KHz using a clock of 100KHz.	CO3	7 Marks

(OR)

2	a)	Sketch and explain Fully Differential Filters.	CO1	7 Marks
	b)	Discuss in detail about Biquad Filter.	CO1	7 Marks

UNIT-II

3	a)	Define problem of lock acquisition and discuss about stability issues of basic charge pump PLL.	CO1	7 Marks
	b)	Write about the behavior of PLL in locked condition and draw its respective waveforms and also write about delay locked loops.	CO1	7 Marks

(OR)

4	a)	Draw and explain the circuit of simple charge pump PLL and write about the linear model of simple charge pump PLL.	CO1	7 Marks
	b)	Describe in detail about the non-ideal effects in PLL.	CO1	7 Marks

UNIT-III

5	a)	Discuss in detail the performance limitations of data converters.	CO1	7 Marks
	b)	An input signal arrives at a quantizer already corrupted with some noise and having a SNR of 35 dB. How many bits of resolution does the quantizer require to ensure that the quantization noise is at least 3dB smaller than the input noise?	CO3	7 Marks

(OR)

6	a)	Describe in detail the working of thermometer-code current-mode D/A converters.	CO2	7 Marks
	b)	Illustrate the segmented D/A hybrid converter.	CO1	7 Marks

UNIT-IV

7	a)	Sketch the flow graph for the Successive-Approximation approach and explain the conversion process.	CO3	7 Marks
	b)	Explain the operation of Integrating Converters for three different input voltages.	CO3	7 Marks

(OR)

8	a)	Discuss the operating mode of Unipolar charge-Redistribution A/D converter with suitable schematics.	CO4	7 Marks
	b)	A-5-bit Successive- Approximation Converter, has a parasitic capacitance of 12C at V^1 node. Investigate the node voltage at V^1 for an input voltage V_{in} =1.5V and V_{ref} = 5V.	CO4	7 Marks

UNIT-V

9	a)	Discuss the construction of multi stage decimation filter.	CO1	7 Marks
	b)	Compare and contrast noise analysis of first and second order band pass over sampling converters.	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

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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

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

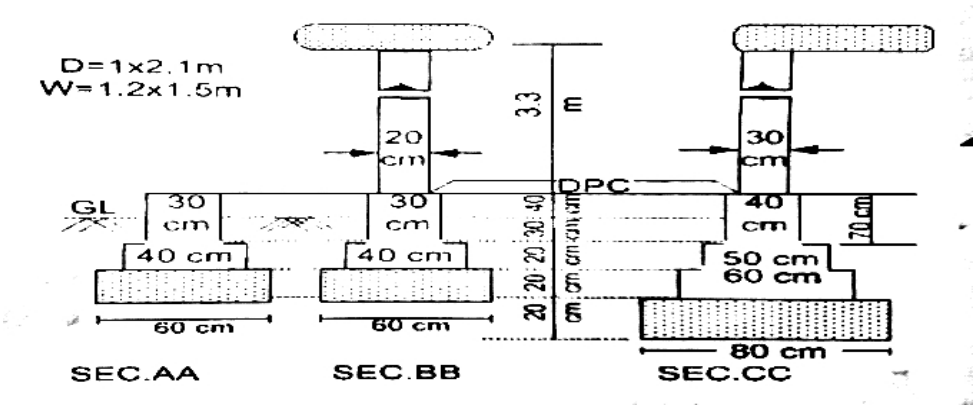
[Civil Engineering]

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

CODE No.:14BT80202 SVEC-14

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.: 16BT30241 SVEC-16 (RA)

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech II Semester (SVEC-16) Regular Examinations June – 2021

ELECTRICAL TECHNOLOGY

[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 different types of self-excited DC generators? Obtain the terminal voltage and current expressions for each of them.	CO1	8 Marks
	b)	Explain the various losses in DC machine.	CO1	6 Marks
		OR)		
2.	a)	Explain the load characteristics of Shunt, Series and Compound motors and thereby bring out their applications.	CO6	7 Marks
	b)	Explain various methods to control the speed of DC shunt motor.	CO5	7 Marks

UNIT-II

3.	a)	A 125 kVA transformer has a primary voltage of 2000V at 50Hz with 182 and 40 turns on primary and secondary respectively. Neglecting the losses calculate i) no load secondary e.m.f. ii) full load primary and secondary currents. iii) flux in the core.	CO2	7 Marks
	b)	Develop the equivalent circuit of a single phase transformer.	CO2	7 Marks
		(OR)		
4.	a)	Draw the equivalent circuit of a transformer and show how the constants of primary and secondary windings may be combined to give a simplified equivalent circuit with the values of constants given in terms of secondary winding.	CO1	7 Marks
	b)	A 3300/240V single phase transformer takes a no load current of 2 A at a p.f. of 0.25 lagging. Determine the primary current and p.f., when the transformer supplying a load of 60 A at a p.f. of 0.9 lagging.	CO2	7 Marks

UNIT-III

5.	a)	A three phase balanced delta connected load of (5+j8)Ω per phase is connected 400V. Calculate the i) phase currents ii) line currents iii) total power consumed by the load.	CO2	7 Marks
	b)	Two wattmeter method is used to measure the power taken by a three phase induction motor on no-load. The wattmeter readings are 375W and -50W. Calculate power factor, phase angle difference of voltage and current in two wattmeters.	CO2	7 Marks
		(OR)		
6.	a)	Explain the generation of three phase voltages	CO1	4 Marks
	b)	A balanced star connected load of (4+j3)Ω per phase is connected to balanced three phase supply. The phase current is 12 A. Find active power, reactive power and apparent power.	CO2	6 Marks
	c)	A balanced delta connected load of (4+j8)Ω per phase is connected 400 V balanced three phase supply. Determine phase and line currents.	CO2	4 Marks

UNIT-IV

7.	a)	Explain how a rotating magnetic field is produced in a three phase induction motor with the help of a neat diagram.	CO1	10 Marks
	b)	A three phase, 6 pole, 50Hz induction motor develops 4kW including friction and windage losses at 950 r.p.m. If the stator loss is 250W, find the rotor frequency.	CO2	4 Marks

(OR)

8.	a)	Derive the condition for maximum running torque of three phase induction motor.	CO1	7 Marks
	b)	A 4-pole, three phase induction motor operates from a supply whose frequency is 50Hz. Calculate i) the speed at which the magnetic field of the stator is rotating ii) the speed of the rotor when the slip is 0.04 iii) the frequency of the rotor currents when the slip is 0.03 (iv) the frequency of the rotor currents at standstill.	CO2	7 Marks

UNIT-V

9.	a)	Draw and explain the constructional details of shaded-pole motor.	CO1	7 Marks
	b)	Explain the working principle of operation of universal motor and list out its applications.	CO1	7 Marks

(OR)

10.	a)	List out the different types of stepper motors according to their construction.	CO1	7 Marks
	b)	Explain the differences between capacitor start, capacitor start-capacitor run and permanent split capacitor motors.	CO2	7 Marks

CODE No.: 16BT30403 SVEC-16 (RA)

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech II Semester (SVEC-16) Regular Examinations June – 2021

SWITCHING THEORY AND LOGIC 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)	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 Theroms.	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. $F(A, B, C, D, E) = \sum m (1, 4, 6, 10, 20, 22, 24, 26)$.	CO4	10 Marks
	b)	Reduce the following function using K-map. $F(A, B, C, D, E) = \sum m (1, 4, 6, 10)$.	CO5	4 Marks
		(OR)		
4.	a)	Reduce the following function using K-map $F(A, B, C, D) = \Pi M(0, 2, 3, 8, 9, 12, 13, 15)$.	CO5	7 Marks
	b)	Obtain the simplified expression in sum of products $F(A, B, C, D) = \Sigma m(1, 2, 4, 11, 12, 13) + d (0, 3, 6, 10)$.	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 function with a MUX: $F(A, B, C) = \sum m(1, 3, 5, 6)$.	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; 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. $W(A,B,C,D)=\Sigma m(0,2,6,7,8,9,12,13)$, $X(A,B,C,D)=\Sigma m(0,2,6,7,8,9,12,13,14)$.	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 equivalent Excess-3 code.	CO6	7 Marks

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CODE No.: 16BT61503 SVEC-16 (RA)

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech II Semester (SVEC-16) Regular Examinations June – 2021

SOFTWARE PROJECT MANAGEMENT

[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)	Elucidate the differences between meta process, micro process, macro process.	CO1	7 Marks
	b)	Discuss about how to achieve required quality to Improving Software Economics.	CO6	7 Marks
		(OR)		
2.	a)	Illustrate the different ways to achieve better economics in software. Explain with an example.	CO6	10 Marks
	b)	Write short notes on the waterfall model.	CO1	4 Marks
		UNIT-II		
3.	a)	List and explain the principles of modern software management.	CO2	7 Marks
	b)	Describe the two stages of the life cycle to active economies of scale and higher returns on investment.	C06	7 Marks
		(OR)		
4.		Write short notes on the following lifecycle phases of Software Development: i) Construction Phase. ii) Transition Phase.	CO3	14 Marks
		UNIT-III		
5.	a)	Draw and explain architecture for software project with respect to Management perspective.	CO3	10 Marks
	b)	Discuss software process workflows with an example.	CO4	4 Marks
		(OR)		
6.	a)	Discuss any four Management Artifacts to improve the product and process documentation.	CO2	7 Marks
	b)	What are the seven workflows in the life cycle? Explain the artifacts of each of workflow.	CO3	7 Marks
		UNIT-IV		
7.	a)	Explain the purpose of Planning Guidelines in Iterative Process Planning.	CO4	7 Marks
	b)	Explain the Periodic status assessments.	CO5	7 Marks
		(OR)		
8.	a)	Explain the adopted default roles and responsibilities in software line of business organization.	CO4	7 Marks
	b)	Discuss the top-down and bottom-up approaches of the Cost and Schedule Estimating Process.	CO3	7 Marks
		UNIT-V		
9.	a)	Discuss the Seven core metrics for the Software Project with an example.	CO1	7 Marks
	b)	Illustrate the role of SCRUM master in Agile Model in detail.	CO2	7 Marks
		(OR)		
10.	a)	Discuss the roles of Project Manager in the Agile Management.	CO1	7 Marks
	b)	List all Quality indicators and Management indicators. Explain their role in project control.	CO1	7 Marks

CODE No.: 16BT71204 SVEC-16 (RA)

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech II Semester (SVEC-16) Regular Examinations June – 2021

MOBILE COMPUTING

[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 with a diagram, the steps involved in a mobile terminated call (a station calling a mobile station) in GSM.	CO1	7 Marks
	b)	What are the software layers and components needed in mobile computing devices?	CO1	7 Marks
		(OR)		
2.	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

UNIT-II

3.	a)	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.	CO1	7 Marks
	b)	Summarize the benefits of reservation schemes. How are collisions avoided during data transmission, why is the probability of collisions lower in reservation schemes compared to classical Aloha?	CO1	7 Marks
		(OR)		
4.	a)	Compare IEEE 802.11 and Bluetooth with regard to their ad-hoc capabilities.	CO1	7 Marks
	b)	If Bluetooth is a commercial success, what are remaining reasons for the use of infrared transmission for WLANs? Justify.	CO4	7 Marks

UNIT-III

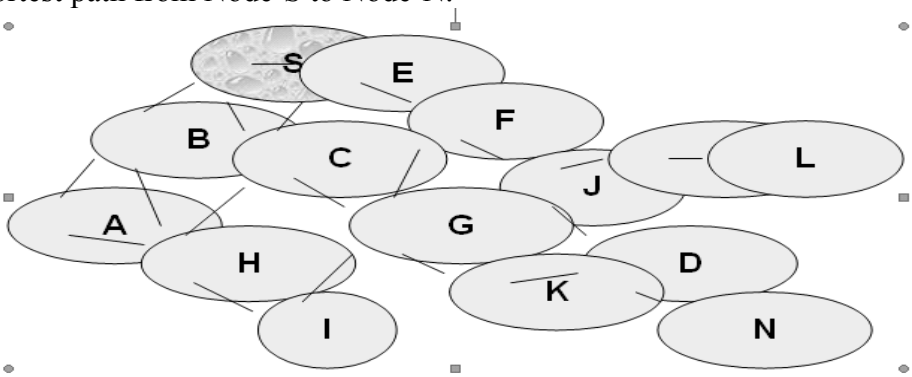
5.	a)	Explain packet flow, if two mobile nodes communicate and both are in foreign networks. What additional routes do packets take if reverse tunneling is required?	CO5	7 Marks
	b)	What is the role of reverse tunneling in route optimization? Explain.	CO5	7 Marks
		(OR)		
6.	a)	How and why does I-TCP isolate problems on the wireless link? What are the main drawbacks of this solution?	CO1	7 Marks
	b)	Discuss the TCP characteristics to be considered when developing applications over 2.5/3G wireless networks	CO1	7 Marks

UNIT-IV

7.	a)	Illustrate the situations in which a database can crash. Explain how does database recovery can be done using a recovery manager.	CO2	8 Marks
	b)	Define power aware computing. Enlist the power aware computing techniques.	CO2	6 Marks
		(OR)		
8.	a)	Compare and contrast Push Data delivery and Pull Data delivery mechanisms.	CO2	8 Marks
	b)	Explain the functions of Hybrid mechanisms with a neat sketch.	CO2	6 Marks

UNIT-V

9.	a)	Discuss the challenges and issues in implementing MANETs.	CO3	5 Marks
	b)	Apply DSR Routing Algorithm for the following network to find the shortest path from Node-S to Node-N.	CO3	9 Marks



(OR)

10.	a)	Explain Wireless transport layer security in WAP with respective service primitives.	CO4	7 Marks
	b)	Which WTP class reflects typical best web access? Discuss how unnecessary overhead is occurring when using WSP on top of this class for web browsing.	CO4	7 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

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. I Semester (SVEC-20) Supplementary Examinations November – 2021

COMPUTER NETWORKS

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Justify "Design complexity can be reduced by organizing networks as a stack of layers".	6 Marks	L4	CO4	PO4
	b)	How networks are classified? Elaborate the types of networks.	6 Marks	L2	CO1	PO2
		(OR)				
2.		Describe the following: i) Twisted-Pairs. ii) Coaxial Cable. iii) Fiber Optics.	12 Marks	L1	CO1	PO1
		UNIT-II				
3.		Explain the steps involved in Cyclic Redundancy Check (CRC) mechanism with a neat diagram. What is the check summed frame transmitted if the message is 1101011011 and the generator polynomial is x^4+x+1 using CRC?	12 Marks	L3	CO2	PO5
		(OR)				
4.		What is Framing? Explain the significance of framing and discuss various framing techniques implemented in Data Link layer.	12 Marks	L2	CO2	PO3
		UNIT-III				
5.	a)	Identify the top 10 principles of the network layer in the internet.	6 Marks	L2	CO2	PO6
	b)	Compare Internet Protocols IPV4 and IPV6.	6 Marks	L4	CO2	PO3
		(OR)				
6.		Elaborate the process of Internetworking in the Network layer.	12 Marks	L2	CO1	PO2
		UNIT-IV				
7.	a)	Describe the Real-time Transport Protocol (RTP) header format with a neat sketch.	6 Marks	L2	CO3	PO3
	b)	How error-control and flow control mechanisms can be implemented in transport layer?	6 Marks	L2	CO3	PO2
		(OR)				
8.		Draw TCP connection management finite state machine diagram and explain each state.	12 Marks	L2	CO3	PO2
		UNIT-V				
9.		Sketch and explain the message formats supported by e-mail.	12 Marks	L2	CO4	PO3
		(OR)				
10.	a)	List out the complaints associated with an electronic mail in the early days.	6 Marks	L2	CO4	PO6
	b)	What is the role of Message Transfer Agent?	6 Marks	L1	CO4	PO2

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. I Semester (SVEC-20) Supplementary Examinations November – 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)	Differentiate Linear and Nonlinear data structures.	4 Marks	L2	CO1	PO2
	b)	What is Time complexity? What are Asymptotic notations? Discuss the purpose of three notations.	8 Marks	L4	CO1	PO2
		(OR)				
2.	a)	What is Recursion? Design the recursive algorithm for bubble sort.	6 Marks	L3	CO2	PO2
	b)	Differentiate linear and binary search methods. Discuss when and where they are used.	6 Marks	L2	CO2	PO2
		UNIT-II				
3.	a)	What is Linked List? Explain types of linked lists with a note with its applications.	6 Marks	L2	CO3	PO3
	b)	Implement Radix sort using linked list.	6 Marks	L3	CO3	PO3
		(OR)				
4.	a)	How deletion operations at any position in singly linked list is performed?	6 Marks	L3	CO3	PO3
	b)	Write a routine to add two polynomials using single linked list.	6 Marks	L3	CO3	PO3
		UNIT-III				
5.	a)	Write a program to implement stack using array.	6 Marks	L2	CO4	PO1
	b)	Write an algorithm to insert and delete an element from the circular queue.	6 Marks	L3	CO4	PO1
		(OR)				
6.	a)	Write a program to reverse the given string using stack.	6 Marks	L3	CO4	PO1
	b)	Write a program to implement queue using array.	6 Marks	L2	CO4	PO1
		UNIT-IV				
7.	a)	What is a Binary tree? What are its applications? Define different tree traversal techniques.	6 Marks	L2	CO5	PO1
	b)	Show at each step the AVL tree built from following sequence of insertions: 8,15,1,19,16,4,25,12,23,20,17. Start with empty tree. Label the rotations according to type.	6 Marks	L3	CO5	PO1
		(OR)				
8.	a)	What is Heap? Explain types of Heap.	6 Marks	L2	CO5	PO1
	b)	Write an algorithm for heap sort and trace out by taking an example.	6 Marks	L3	CO5	PO1
		UNIT-V				
9.	a)	Explain different graph representation methods.	6 Marks	L2	CO5	PO1
	b)	Illustrate the insertion operation in B Tree of order 4 by using the following keys: {23,46,57,89,3,4,67,194,45,2,8,90,109,234,78}.	6 Marks	L3	CO5	PO1
		(OR)				
10.	a)	Write a program to implement Breadth First Search algorithm.	6 Marks	L3	CO5	PO1
	b)	What is collision? What are different methods of collision resolution in hashing?	6 Marks	L2	CO6	PO2

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. I Semester (SVEC-20) supplementary Examinations November – 2021

PYTHON PROGRAMMING

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Explain the interactive shell prompt and script files of python to write the source code and execute.	7 Marks	L2	CO1	PO1
	b)	Describe the various kinds of applications that can be developed by Python.	5 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Define the parameters to analyse the efficiency of the algorithms.	7 Marks	L2	CO1	PO1
	b)	Justify Python is a dynamically typed language.	5 Marks	L2	CO1	PO2
		UNIT-II				
3.		Explain loop control statements while..else and for..in.else. Write a python program to check given number is prime or not using for..in .else loop.	12 Marks	L1	CO2	PO1
		(OR)				
4.	a)	Describe list comprehension and list unpacking with suitable examples.	8 Marks	L4	CO2	PO4
	b)	Differentiate between pop() and remove() list methods.	4 Marks	L2	CO2	PO1
		UNIT-III				
5.	a)	Explain the string functions to remove unwanted white spaces in the string write the method syntax and description.	8 Marks	L2	CO3	PO2
	b)	Discuss append mode and overwrite modes in files.	4 Marks	L3	CO3	PO2
		(OR)				
6.	a)	Discuss the types of arguments in python functions. Write a python function to compute the area of a triangle of return the result.	6 Marks	L2	CO3	PO2
	b)	Explain the keywords of exception handling with example.	6 Marks	L3	CO3	PO2
		UNIT-IV				
7.	a)	Discuss the concept of instance variables and instance methods.	6 Marks	L3	CO4	PO4
	b)	Explain the Turtle motion functions.	6 Marks	L3	CO4	PO4
		(OR)				
8.	a)	Explain the concept of inheritance and types of inheritance in Python.	7 Marks	L1	CO4	PO5
	b)	Discuss turtle window.	5 Marks	L2	CO4	PO2
		UNIT-V				
9.		Explain the process of creating checkbutton and various parameters in tkinter.	12 Marks	L2	CO5	PO5
		(OR)				
10.		Define widgets and discuss buttons, labels.	12 Marks	L2	CO5	PO5

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. II Semester (SVEC-20) Regular Examinations November – 2021

FINANCIAL AND MANAGEMENT ACCOUNTING

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. What is accounting? Explain different accounting principles. 12 Marks L2 CO1 PO2

(OR)

2. From the following transactions, make the journal entries in the books of Pradeep Business. 12 Marks L3 CO1 PO3

2021		Rs.
Jan 1	Pradeep brought capital for starting business	40,000
2	Purchased goods for cash	10,000
6	Purchased goods form Murali	4,000
10	Sold goods to Murali on credit	10,000
12	Cash received from Murali	5,000
19	Cash paid to Murali	1,000
24	Cash paid to Das	2,000
27	Drawn for personal use	100
29	Rent paid to landlord	200
31	Salaried paid	500

UNIT-II

3. From the following trial balance of M/s Ram & Sons, prepare Trading and Profit and loss account for the year ending 31st March, 2021 and the Balance sheet as on that date: 12 Marks L3 CO1 PO2

	Debit (Rs.)	Credit (Rs.)
Purchases	21,750	
Discount allowed	1,300	
Wages	6,500	
Salaries	2,000	
Sales		35,000
Travelling expenses	400	
Commission	425	
Carriage inward	275	
Administration expenses	105	
Trade expenses	600	
Interest	250	
Building	5,000	
Furniture	200	
Debtors	4,250	
Capital		13,000
Creditors		2,100
Cash	7,045	
Total	50,100	50,100

Stock on 31st March, 2021 was Rs.6000. Depreciate buildings by 20%. Create a provision for bad debts at 10% on debtors. Outstanding wages Rs.475.

(OR)

4.	Explain the advantages and disadvantages of computerized accounting.	12 Marks	L2	CO1	PO3

UNIT-III

5.	Explain the advantages and disadvantages of ratio analysis.	12 Marks	L2	CO2	PO2

(OR)

6.	What are the profitability ratios? Explain them with an example.	12 Marks	L3	CO2	PO3

UNIT-IV

7.	The following information was extracted from the books of M/s Ravi & Sons. Sales = Rs.1,80,000 Variable Costs = Rs.1,44,000 Fixed costs = Rs.24,000 Calculate the following: i) P/V ratio. ii) Break-even point. iii) Net profit earned at sales of Rs.2,70,000. iv) Sales required to earn a profit of Rs.24,000.	12 Marks	L3	CO2	PO2

(OR)

8.	Explain the advantages of break-even analysis in profit planning.	12 Marks	L2	CO2	PO3

UNIT-V

9.	A company is considering whether to purchase a new machine. Machines A and B are available for Rs.80,000 each. Earnings after taxation are as follows:	12 Marks	L3	CO2	PO2

Year	Machine A (Rs.)	Machine B (Rs.)
1	24,000	8,000
2	32,000	24,000
3	40,000	32,000
4	24,000	48,000
5	16,000	32,000

Evaluate two alternatives using Net Present Value (NPV). You should use a discount rate of 10%.

(OR)

10.	Explain the Internal Rate of Return (IRR) with an example.	12 Marks	L2	CO2	PO3

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. II Semester (SVEC-20) Regular Examinations November – 2021

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)	Explain the typical architecture of Data warehouse.	6 Marks	L3	CO1	PO3
	b)	Define data warehouse. Briefly describe the need for data warehousing.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Describe the steps involved in data mining when viewed as a process of knowledge discovery.	7 Marks	L3	CO1	PO3
	b)	Differentiate star and fact constellation schemas.	5 Marks	L3	CO1	PO3
		UNIT-II				
3.	a)	What kinds of patterns can be mined?	6 Marks	L2	CO2	PO2
	b)	Explain various disciplines that influences the development of data mining methods.	6 Marks	L4	CO2	PO4
		(OR)				
4.	a)	Explain major tasks in data pre-processing.	6 Marks	L4	CO2	PO4
	b)	Discuss the approaches of data cleaning process.	6 Marks	L4	CO2	PO4
		UNIT-III				
5.	a)	How to improve the efficiency of Apriori-based mining?	4 Marks	L3	CO3	PO4
	b)	Explain Apriori algorithm for discovering frequent itemsets for mining Boolean association rules.	8 Marks	L2	CO3	PO5
		(OR)				
6.	a)	Explain how classification work with neat diagram.	7 Marks	L2	CO3	PO2
	b)	Discuss the techniques to improve classification accuracy.	5 Marks	L3	CO3	PO3
		UNIT-IV				
7.	a)	Define Cluster analysis. Explain requirements of clustering in data mining.	5 Marks	L2	CO4	PO4
	b)	Describe about partitioning methods k-means and k-medoids.	7 Marks	L3	CO4	PO2
		(OR)				
8.	a)	Differentiate agglomerative and divisive hierarchical clustering.	6 Marks	L3	CO4	PO3
	b)	Discuss the technique to find dense regions in density-based clustering.	6 Marks	L4	CO4	PO4
		UNIT-V				
9.	a)	Explain how data mining useful for financial data analysis with suitable examples.	6 Marks	L2	CO5	PO1
	b)	Describe how web mining can be organized.	6 Marks	L2	CO5	PO1
		(OR)				
10.	a)	Describe various complex types of data for mining.	6 Marks	L3	CO5	PO3
	b)	Discuss various statistical data mining techniques.	6 Marks	L4	CO5	PO1

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. II Semester (SVEC-20) Regular Examinations November – 2021

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)	Highlight the object oriented features of Java.	5 Marks	L1	CO1	PO1
	b)	Define an array. Demonstrate multidimensional arrays.	7 Marks	L1	CO1	PO2
		(OR)				
2.	a)	Explain iterative statements in Java.	5 Marks	L1	CO3	PO1
	b)	Define overloading methods and explain overloading constructor.	7 Marks	L1	CO1	PO2
		UNIT-II				
3.		What is an abstract class and abstract method? Explain with a suitable program.	12 Marks	L1	CO2	PO4
		(OR)				
4.	a)	Define package. Explain in details about access protection.	7 Marks	L1	CO2	PO2
	b)	Explain variables in interface with an example program.	5 Marks	L1	CO3	PO3
		UNIT-III				
5.		Explain in detail about Collection classes with example programs.	12 Marks	L1	CO3	PO2
		(OR)				
6.		Elaborate Character stream I/O operations with an example Java program.	12 Marks	L2	CO3	PO2 PO3
		UNIT-IV				
7.		Explain in detail Thread Life Cycle with an example programs.	12 Marks	L1	CO4	PO3
		(OR)				
8.		Explain exception handling in Java with an example program.	12 Marks	L1	CO4	PO2
		UNIT-V				
9.		Describe Event Handling. Explain each one with an example.	12 Marks	L1	CO4	PO3
		(OR)				
10.		Explain the following Swing components: i) JTextField ii) JToggleButton iii) JScrollPane iv) JComboBox	12 Marks	L1	CO4	PO2 PO5

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. II Semester (SVEC-20) Regular Examinations November – 2021

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)	Categorize the security services defined by X.800.	5 Marks	L3	CO1	PO2
	b)	Show the Encryption and Decryption process of Caesar cipher substitution technique.	7 Marks	L3	CO1	PO2
		(OR)				
2.	a)	Tabulate the types of attacks on Encrypted messages.	5 Marks	L3	CO1	PO1
	b)	Relate how relative frequency of the English letters pave way for strong Cipher text generation in Monoalphabetic Ciphers. Discuss.	7 Marks	L2	CO1	PO2
		UNIT-II				
3.	a)	Explain the encryption and decryption operation in ECB mode. Analyze its advantages and disadvantages.	6 Marks	L2	CO3	PO3
	b)	Outline the design principles of block cipher.	6 Marks	L3	CO3	PO1
		(OR)				
4.		Outline Diffie-Hellman Key Exchange algorithm.	12 Marks	L2	CO3	PO1
		UNIT-III				
5.		Describe the overall architecture of SHA with message digest generation.	12 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Organize the technical deficiencies in Kerberos version 4 protocol.	6 Marks	L3	CO3	PO1
	b)	Draw and label the X.509 certificate format.	6 Marks	L2	CO3	PO4
		UNIT-IV				
7.	a)	Summarize on PGP services.	7 Marks	L3	CO2	PO1
	b)	Identify the difference between top-level format and payload data of an ESP packet.	5 Marks	L2	CO2	PO1
		(OR)				
8.	a)	Identify the change when transport mode ESP is appended to an IP format and compare the results with the tunnel mode.	6 Marks	L2	CO2	PO2
	b)	Organize a scenario how message exchange occurs as pairs in IKEv2.	6 Marks	L3	CO2	PO3
		UNIT-V				
9.		Discuss about the TLS Protocol Stack with a neat diagram and outline the parameters of connection state.	12 Marks	L3	CO4	PO1
		(OR)				
10.		Develop a model to show the interrelationship between the standardized protocols of SP 800-177 for assuring message Authenticity and Integrity.	12 Marks	L3	CO4	PO2

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. II Semester (SVEC-20) Regular Examinations November – 2021

MACHINE LEARNING

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

	UNIT-I				
1.	What are the different problems in designing a learning system?	12Marks	L2	CO1	PO1
	(OR)				
2.	Explain the version spaces and candidate elimination algorithm.	12Marks	L3	CO2	PO1
	UNIT-II				
3.	How inductive bias is applied in the training of decision tress?	12Marks	L2	CO1	PO2
	(OR)				
4.	What are different activation functions in ANN?	12Marks	L1	CO2	PO2
	UNIT-III				
5.	Explain bayes classifier for classification of text by providing training and testing models.	12Marks	L2	CO1	PO3
	(OR)				
6.	Differentiate maximum likelihood and least squared error hypothesis.	12Marks	L1	CO2	PO2
	UNIT-IV				
7.	Explain the concept of inverted deduction.	12Marks	L1	CO2	PO2
	(OR)				
8.	How search control knowledge in explanation-based learning?	12Marks	L3	CO3	PO2
	UNIT-V				
9.	How inductive and analytical learning are combined to improve the overall performance of the learning models?	12Marks	L2	CO4	PO2
	(OR)				
10.	What is the difference between Q – Leaning and temporal difference learning?	12Marks	L3	CO4	PO2

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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

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

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CODE No.: 19MC20101 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. II Semester (SVEC-19) Supplementary Examinations February - 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)	Explain the advantages of DBMS. Name different kinds of data models used in relational database.	7 Marks	L2	CO1	PO1 PO2
	b)	Construct database system 3-tier architecture with neat diagram.	5 Marks	L2	CO1	PO1 PO3
		(OR)				
2.	a)	Analyze the concepts of class hierarchy and aggregation features of E-R model with an example.	6 Marks	L4	CO2	PO2 PO3
	b)	Identify various database languages with examples.	6 Marks	L2	CO1	PO1 PO2
		UNIT-II				
3.		Identify the derived and composite attributes, strong and weak entity sets and relationships for banking enterprise system with a neat E-R diagram.	12 Marks	L3	CO2	PO2 PO3
		(OR)				
4.		Apply complex integrity constraints with suitable example using SQL.	12 Marks	L3	CO2	PO1 PO2 PO5
		UNIT-III				
5.		What is the relationship exists between 3 Normal Form (NF) and Boyce Code Normal Form (BCNF)? Distinguish 3NF and BCNF. Consider any one relational schema which is in 2 NF and convert it into BCNF.	12 Marks	L4	CO1	PO1 PO2 PO3
		(OR)				
6.		Make use of Structured Query Language in solving the following with relevant example: i) Nested queries. ii) Joins. iii) Aggregate functions.	12 Marks	L3	CO2	PO1 PO2 PO5
		UNIT-IV				
7.		Define ACID properties. Apply strict two-phase locking technique for serial execution and interleaved execution.	12 Marks	L3	CO1	PO1 PO2
		(OR)				
8.		Analyze the steps involved in recovering from system crash.	12 Marks	L4	CO1	PO1 PO2
		UNIT-V				
9.		Describe in detail about B+ tree indexing method. List out the rules for construction of B+ tree.	12 Marks	L2	CO2	PO1 PO2
		(OR)				
10.		Illustrate Indexed Sequential Access Method (ISAM) index structure with a neat sketch.	12 Marks	L2	CO2	PO1 PO3

CODE No.: 19MC20104 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. II Semester (SVEC-19) Supplementary Examinations February – 2021

SOFTWARE ENGINEERING
[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)	Identify different levels of abstraction for the software design.	6 Marks	L2	CO1	PO1 PO2
	b)	Elucidate in detail about Adaptive Software Development.	6 Marks	L1	CO1	PO1
		(OR)				
2.	a)	Inspect the situations where Waterfall Model is most appropriate.	6 Marks	L3	CO1	PO1 PO2
	b)	List out generic process framework activities.	6 Marks	L2	CO1	PO1 PO2
		UNIT-II				
3.	a)	Design the state diagram for analysis classes for the control panel class.	6 Marks	L3	CO2	PO1 PO3
	b)	Elucidate in detail about Class-Responsibility Collaborator modeling.	6 Marks	L2	CO1	PO1
		(OR)				
4.		Explain in detail about the following concepts: i) Cardinality and Modality. ii) Relationships.	12 Marks	L1	CO1	PO1
		UNIT-III				
5.		Design Data Centered Architecture and the Data Flow Architecture from the Architectural Styles with explanation.	12 Marks	L2	CO2	PO1 PO3
		(OR)				
6.		Write the design steps to map data flow diagram into architecture. Represent the context level Data Flow Diagram (DFD) for the Safe Home security function.	12 Marks	L3	CO2	PO1 PO3
		UNIT-IV				
7.	a)	What is the purpose of Unit Testing? What are the unit test considerations to be focused?	6 Marks	L4	CO1	PO1 PO2
	b)	Illustrate strategic issues in Testing strategies.	6 Marks	L3	CO1	PO1 PO3
		(OR)				
8.		How user analysis can be done in interface analysis with suitable example?	12 Marks	L4	CO2	PO1 PO2 PO3
		UNIT-V				
9.		Distinguish between Reactive Vs proactive risk strategies in detail.	12 Marks	L2	CO1	PO1 PO2
		(OR)				
10.	a)	Explain in detail about formal technical reviews.	5 Marks	L2	CO1	PO1 PO2
	b)	Provide measures of software quality which provide useful indicators for the project team.	7 Marks	L4	CO2	PO1 PO3

CODE No.: 16MC30103 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

MCA III Semester (SVEC-16) Supplementary Examinations February – 2021

OBJECT ORIENTED ANALYSIS AND DESIGN

[Master of Computer Applications]

Max. Marks: 70

Time: 3 hours

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1		State and explain the classification of things with UML notation.	CO1	12 Marks
		(OR)		
2	a)	Justify which UML diagrams give a static view and which give a dynamic view of a system.	CO2	6 Marks
	b)	i) Represent how model simple dependencies.	CO3	6 Marks
		ii) Write a short note on structural relationships.	CO1	

UNIT-II

3	a)	Contrast object diagram with class diagram.	CO4	6 Marks
	b)	Represent advanced classes and advanced relationships with suitable example.	CO3	6 Marks
		(OR)		
4	a)	Enumerate the steps involved in modeling Logical database schema.	CO2	6 Marks
	b)	The cellular network must place the phone call correctly and also schedule the receiving and conference calls. Draw a class diagram.	CO5	6 Marks

UNIT-III

5	a)	Draw a collaboration diagram that specifies the flow of control involved in registering a new student at a school.	CO5	7 Marks
	b)	Elucidate usecase diagram with suitable example	CO1	5 Marks
		(OR)		
6	a)	How to model flows of control by organization in UML?	CO3	7 Marks
	b)	Enumerate the modeling techniques to model usecase.	CO2	5 Marks

UNIT-IV

7	a)	Explain the need of synchronization along with the three properties.	CO1	6 Marks
	b)	What is state and transition? Develop state chart diagram for Library Management system.	CO4	6 Marks
		(OR)		
8		Compare the following: i) Event ***vs*** Signal. ii) Sequential substates ***vs*** Concurrent substates.	CO2	12 Marks

UNIT-V

9	a)	Define node. Contrast node with components.	CO2	4 Marks
	b)	Illustrate modeling mechanisms for a fully distributed system.	CO2	4 Marks
	c)	Explain active object in library system.	CO1	4 Marks
		(OR)		
10	a)	Explain the following terms: i) Component Diagram. ii) Deployment Diagram.	CO1	6 Marks
	b)	Explain the interaction diagrams for “renewal of a book” operation in a library application.	CO5	6 Marks

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CODE No.: 19MC3BS01 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. III Semester (SVEC-19) Regular Examinations February – 2021

OPERATIONS RESEARCH

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Explain different phases of Operations Research. 4 Marks L1 CO1 PO1

   b) Use graphical method to solve the following LPP. 8 Marks L3 CO2 PO1 PO2 PO3

Maximize $\mathbf{Z = 8\,X_1 + 5\,X_2}$

Subject to $\mathbf{2\,X_1 + X_2 \le 500}$

$\mathbf{X_1 \le 150}$

$\mathbf{X_2 \le 25}$

$\mathbf{X_1, X_2 \ge 0}$

(OR)

2. Solve the following LPP using Two-Phase simplex method: 12 Marks L3 CO2 PO1 PO2

Maximize $\mathbf{Z = -4\,X_1 - 3\,X_2 - 9\,X_3}$

subject to $\mathbf{2\,X_1 + 4\,X_2 + 6\,X_3 \ge 15}$

$\mathbf{6\,X_1 + X_2 + 6\,X_3 \ge 12}$

and $\mathbf{X_1, X_2, X_3 \ge 0}$

UNIT-II

3. What do you mean by an unbalanced Transportation Problem (T.P)? Solve the following T.P. using Vogel's method: 12 Marks L4 CO3 PO1 PO2 PO3

To city

From city		A	B	C	D	E	F	Available
	1	9	12	9	6	9	10	5
	2	7	3	7	7	5	5	6
	3	6	5	9	11	3	11	2
	4	6	8	11	2	2	10	9
Requirement		4	4	6	2	4	2	

(OR)

4. Solve the following assignment problem: 12 Marks L4 CO3 PO1 PO2

Machines \ Jobs

	A	B	C	D	E
A	30	25	33	35	36
B	23	29	38	23	26
C	30	27	22	22	22
D	25	31	29	27	32
E	27	29	30	24	32

UNIT-III

5. The Hi-tech Publishers have to publish 8 text books for which it spends the time in days for DTP preparation and printing are estimated as follows. Find the sequence to take up these books to minimize total publishing time and also find the idle time of DTP operator and printing operator. 12 Marks L4 CO3 PO1 PO2

Books	A	B	C	D	E	F	G	H
DTP	14	26	17	11	9	26	18	15
Printing	21	15	16	21	22	12	13	25

(OR)

6. The probability of failure (P_n) just before age **n** years is shown below. If individual replacement costs Rs.12.50 and group replacement costs Rs.3.00 per item, find the optimal replacement policy. — 12 Marks — L3 — CO3 — PO1 PO2

Year (**n**)	1	2	3	4	5
P_n	0.1	0.2	0.25	0.3	0.15

UNIT-IV

7. a) Explain the following: — 4 Marks — L1 — CO1 — PO1 PO2
   i) Principle of Maximin – Minmax
   ii) Pure and Mixed strategies.

   b) Using dominance method solve the following game: — 8 Marks — L3 — CO4 — PO2 PO3

Player-B

Player-A	I	II	III	IV
I	3	2	4	0
II	3	4	2	4
III	4	2	4	0
IV	0	4	0	8

(OR)

8. An automobile production line turns out about 100 cars a day but deviations occur owing to many causes. The production is more accurately described by the probability distribution given below. — 12 Marks — L4 — CO4 — PO1 PO2 PO3

Production/day	Probability	Production/day	Probability
95	0.003	101	0.15
96	0.05	102	0.10
97	0.07	103	0.07
98	0.10	104	0.05
99	0.15	105	0.03
100	0.20	106	0.60

Finished cars are transported across the bay at the end of each day by ferry. If the ferry has space for only101 cars, what will be the average number of cars waiting to be shipped and what will be the average number of empty space on the ship?

UNIT-V

9. A company uses 10000 units per year of an item. The purchase price is Rs.1 per item. Ordering cost is Rs.25 per order. Carrying cost per year is 12% of the inventory value. Find : — 12 Marks — L4 — CO4 — PO1 PO2
   i) The EOQ
   ii) The number of orders per cycle.
   iii) If the lead-time is 4 weeks and assuming 50 working weeks per year, find the reorder point.

(OR)

10. The following table shows the jobs of a network along with their time estimate. The time estimates are in days: — 12 Marks — L4 — CO4 — PO1 PO2 PO3

Job	1-2	1-6	2-3	2-4	3-5	4-5	5-8	6-7	7-8
a	3	2	6	2	5	3	1	3	4
m	6	5	12	5	11	6	4	9	19
b	15	14	30	8	17	15	7	27	28

   i) Draw the project network.

ii) Find the critical path.

iii) Find the probability that the project is completed in 30 days.

CODE No.: 19MC3HS01 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. III Semester (SVEC-19) Regular Examinations February – 2021

ORGANIZATIONAL BEHAVIOR AND HUMAN RESOURCE MANAGEMENT

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

	UNIT-I				
1.	Define management. Explain basic concepts of Management.	12 Marks	L1	CO1	PO1
	(OR)				
2.	Explain the systems approach to management.	12 Marks	L2	CO1	PO1
	UNIT-II				
3.	Justify, *"Role of Organizational Behavior in individual development."*	12 Marks	L2	CO1	PO1
	(OR)				
4.	State the reasons for individual differences.	12 Marks	L1	CO1	PO1
	UNIT-III				
5.	Define leadership. Explain any two styles of leadership.	12 Marks	L2	CO3	PO2 PO10
	(OR)				
6.	Explain the concept of attitude in detail.	12 Marks	L2	CO3	PO2 PO10
	UNIT-IV				
7.	Identify the contemporary issues in job design.	12 Marks	L2	CO2	PO1 PO10
	(OR)				
8.	Illustrate the factors affecting Human Resource Planning (HRP).	12 Marks	L2	CO2	PO1 PO10
	UNIT-V				
9.	Design a recruitment plan for a company with a requirement of 100 freshers, 25 technically experienced people and 2 senior managers.	12 Marks	L3	CO4	PO1
	(OR)				
10.	Distinguish between Training and Selection.	12 Marks	L4	CO4	PO1

CODE No.: 19MC30101 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. III Semester (SVEC-19) Regular Examinations February - 2021

COMPUTER NETWORKS

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	What is a primitive? List the service primitives for implementing a connection-oriented service.	6 Marks	L1	CO1	PO1
	b)	Distinguish between coaxial cable and Twisted pair cables in guided transmission media.	6 Marks	L3	CO2	PO2
		(OR)				
2.		Demonstrate ISO/OSI reference model with a neat sketch.	12 Marks	L2	CO1	PO3
		UNIT-II				
3.	a)	Why parity checks and check sum are used? Explain parity checks and check summing methods with an example.	7 Marks	L3	CO2	PO1
	b)	Compare slotted Aloha and Pure Aloha random access protocols.	5 Marks	L3	CO2	PO2
		(OR)				
4.	a)	Illustrate the Sliding window protocol using *Go-Back N* and *Selective Repeat* techniques.	7 Marks	L3	CO2	PO3
	b)	What is the remainder obtained by dividing x^7+x^5+1 by the generator polynomial x^3+1?	5 Marks	L2	CO2	PO5
		UNIT-III				
5.	a)	Describe hierarchical routing with an example. Mention its advantages and disadvantages.	8 Marks	L2	CO3	PO1
	b)	State the attributes on which networks differ.	4 Marks	L2	CO3	PO1
		(OR)				
6.	a)	Sketch the IPV4 packet format and explain the importance of IP protocol in the internet.	6 Marks	L3	CO3	PO2
	b)	Define Congestion. Identify the factors that lead to congestion.	6 Marks	L4	CO3	PO4
		UNIT-IV				
7.		Discuss about the elements of Transport protocols.	12 Marks	L2	CO3	PO1
		(OR)				
8.	a)	Discuss the two-army problem. Design the protocol scenarios for releasing a connection with a neat sketch.	7 Marks	L2	CO3	PO3
	b)	How an error-control and flow control mechanisms can be implemented in transport layer?	5 Marks	L2	CO3	PO2
		UNIT-V				
9.		What is DNS? Discuss about the Domain Name System (DNS).	12 Marks	L2	CO4	PO2
		(OR)				
10.	a)	Summarize the complaints associated with an electronic mail in the early days.	6 Marks	L3	CO4	PO4
	b)	Explain in detail about File Transfer Protocol (FTP).	6 Marks	L1	CO4	PO1

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.C.A. III Semester (SVEC-19) Regular Examinations February – 2021

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)	State the need and benefits of Data Warehouse.	4 Marks	L1	CO1	PO1
	b)	Design and construct Data Warehouse architecture and explain its components.	8 Marks	L2	CO1	PO3
		(OR)				
2.	a)	List out multidimensional database schemas.	3 Marks	L1	CO1	PO1
	b)	Illustrate star and snow-flake schemas of multidimensional database with its merits and demerits.	9 Marks	L2	CO1	PO3

UNIT-II

3.	a)	Identify the major issues in Data Mining	6 Marks	L2	CO4	PO1
	b)	Write short notes on classification of data mining system.	6 Marks	L2	CO4	PO1
		(OR)				
4.		Elaborate and apply any two methods used in performing data reduction to preprocess the data with reliable examples.	12 Marks	L2	CO4	PO5

UNIT-III

5.		Can we design a method that mines the complete set of frequent item sets without candidate generation? If yes, apply the FP-growth method with suitable example.	12 Marks	L4	CO2	PO5
		(OR)				
6.		Outline the steps required to construct a decision tree in detail with an example data set.	12 Marks	L3	CO2	PO4

UNIT-IV

7.	a)	Differentiate Agglomerative and Divisive hierarchical clustering methods in detail.	6 Marks	L4	CO3	PO4
	b)	Describe types of data in cluster analysis.	6 Marks	L2	CO3	PO1
		(OR)				
8.		Apply partitioning methods to cluster the data and discuss its merits and demerits.	12 Marks	L2	CO3	PO2

UNIT-V

9.	a)	Justify how data mining is applied on Telecommunication industry application.	6 Marks	L1	CO4	PO1
	b)	Write a brief note on Multimedia data mining	6 Marks	L2	CO4	PO1
		(OR)				
10.		Apply various methods and approaches to mine the text database.	12 Marks	L3	CO4	PO5

CODE No.: 19MC30103 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. III Semester (SVEC-19) Regular Examinations February - 2021

PYTHON PROGRAMMING

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

		UNIT-I				
1.	a)	Write short note on computational problem solving.	6 Marks	L1	CO1	PO1
	b)	List and explain the features of python programming language.	6 Marks	L1	CO1	PO1
		(OR)				
2.		Explain syntax, semantics and problem translations with examples.	12 Marks	L2	CO1	PO1
		UNIT-II				
3.	a)	Write a python program to prompt the user to enter month and year to display no of days in a given month.	6 Marks	L3	CO3	PO3
	b)	Explain solution control statement in python with example.	6 Marks	L2	CO1	PO1
		(OR)				
4.	a)	How to traverse a list? Illustrate with the help of an example.	6 Marks	L2	CO3	PO3
	b)	Explain the difference between lists and tuples in python.	6 Marks	L2	CO1	PO1
		UNIT-III				
5.		Illustrate local variable-local scope and global variable-global scope using a program to calculate semester GPA and cumulative GPA for a given student.	12 Marks	L2	CO3	PO3
		(OR)				
6.		Recall the development of a programmer defined module using stack mechanism.	12 Marks	L1	CO2	PO2
		UNIT-IV				
7.		Implement bouncing balls program to illustrate creation of multiple turtles.	12 Marks	L3	CO3	PO3
		(OR)				
8.		What is encapsulation? Discuss the development of python fraction class with suitable example.	12 Marks	L2	CO4	PO1
		UNIT-V				
9.		Describe the ways of building user interfaces using more than one widget.	12 Marks	L1	CO5	PO3
		(OR)				
10		How to build reusable GUI components with classes?	12 Marks	L2	CO5	PO3

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CODE No.: 16MC40108 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

MCA IV Semester (SVEC-16) Supplementary Examinations February – 2021

SOFTWARE PROJECT MANAGEMENT
[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)	Select and apply appropriate techniques to reduce the software product size.	CO5	6 Marks
	b)	Identify the ways of achieving better economics in software.	CO2	6 Marks
		(OR)		
2	a)	List the general quality improvements with a modern process over conventional process. Explain the key practices to improve software quality.	CO2	6 Marks
	b)	Describe the three generations of basic technology advancement in tools, components and processes.	CO1	6 Marks
		UNIT-II		
3		Explain the principles of conventional software engineering.	CO1	12 Marks
		(OR)		
4		Elaborate on Inception and Construction life cycle phase activities.	CO1	12 Marks
		UNIT-III		
5	a)	Illustrate the work break down structure to meet specific needs of software project development.	CO3	6 Marks
	b)	Specify the process of Iteration workflows of a software development project.	CO1	6 Marks
		(OR)		
6	a)	Use appropriate techniques for effective cost and schedule estimation of a software project.	CO5	7 Marks
	b)	Identify various Minor milestones required to provide checkpoint of the process	CO2	5 Marks
		UNIT-IV		
7		Write short notes on: i) Roundtrip Engineering. ii) Change Management.	CO1	12 Marks
		(OR)		
8	a)	Identify the roles and responsibilities in a software line-of-business organization.	CO2	6 Marks
	b)	Select appropriate tool components to automate the software development process with respect to various process workflows.	CO5	6 Marks
		UNIT-V		
9		Evaluate the critical dimensions of tailoring the software development process.	CO4	12 Marks
		(OR)		
10		Apply seven core metrics with their perspectives and purpose to manage a modern software process.	CO5	12 Marks

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

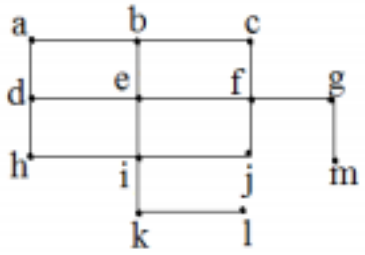
5.	a)	There are 35 students and 4 teachers in a college. In how many ways every student shakes hand with other students and all the teachers.	6 Marks	L2	CO1	PO1
	b)	How many different five digit numbers can be formed from the digits 0,1,2,3 and 4?	6 Marks	L2	CO1	PO1
		(OR)				
6.	a)	Prove that the order 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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

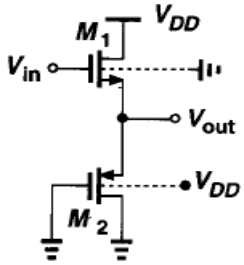
[V L S I]

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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech II Semester (SVEC-19) Supplementary Examinations February - 2021

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)	Define intrinsic and extrinsic size effects.	5 Marks	L1	CO1	PO1
	b)	Illustrate the different properties of nano particles to the same materials in bulk.	7 Marks	L2	CO1	PO1
		(OR)				
2.		Demonstrate the Gleiter's classification strategy of nanostructures materials.	12 Marks	L3	CO1	PO1
		UNIT-II				
3.		Interpret the principal working and application of transmission electron microscopy for the characterization of nano materials.	12 Marks	L2	CO1	PO1
		(OR)				
4.	a)	Identify the role of nano scale dimension on the physical properties of Nano materials (Melting points and lattice constants) of materials.	6 Marks	L3	CO1	PO1
	b)	Solve the mean size of a nano crystallites (nm), where, crystallite shape factor a good approximation is 0.9, 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.		Relate the application and advantages of MEMS in the current technology.	12 Marks	L1	CO2	PO1
		(OR)				
6.	a)	Summarize different fabrication steps to develop MEMS based structure such cantilever.	6 Marks	L2	CO2	PO2
	b)	Contrast the concept MEMS and NEMS with respect to their design and applications.	6 Marks	L4	CO2	PO1
		UNIT-IV				
7.	a)	Outline the semiconducting and metallic properties of CNT based on chiral indices (n, m).	6 Marks	L2	CO3	PO1
	b)	Construct the flowchart of one of the growth methods of Carbon Nano tubes.	6 Marks	L3	CO3	PO1
		(OR)				
8.		Analyze and contribute views on versatile applications of CNTs in multidisciplinary research in nanotechnology.	12 Marks	L4	CO3	PO1
		UNIT-V				
9.		Identify working principle of a nanodevice for biological applications of Nano particles.	12 Marks	L3	CO3	PO2
		(OR)				
10.	a)	Analyze different quantum devices considering the synthetic tailoring of band gaps.	6 Marks	L4	CO4	PO1
	b)	Illustrate the catalysis by gold nano particles.	6 Marks	L2	CO4	PO1